

RESTORING DETERIORATED LOAD COIL CASES

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1. GENERAL

1.01 The information covered within this section describes a technique which permits in-service repair of deteriorated telephone load coil cases which are leaking air.

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

1.03 The repair technique is applicable to all types of metal load coil cases. The technique varies only slightly depending upon whether the case is in a vertical or horizontal position.

1.04 The repair is made by pumping RP-6018 polyurethane compound into the load coil case. As the compound fills the case, the leaks in the case shell are sealed and all interior case components are totally encapsulated. The compound cures to a firm, flexible mass in approximately 90 minutes at 25°C (77°F), thus preventing air loss and moisture

damage even though corrosion may continue to attack the exterior metal for several years.

2. G-810-LCR RESTORATION PUMP KIT

2.01 The G-180-LCR Pump Kit (Figure 1) consists of: a pump equipped with air input and fluid output assemblies, an empty 5 gallon cleaning container, a compound mixing assembly, 1 1/2" nylon fluid output (injection hose, No. 4 and No. 5 valve assemblies for attachment to the load coil case, a riser drain tube, a cleaning rod, a package of metal plugs, and a packaged assortment of nylon locking sleeves (for the special adapter fittings), nylon compression rings (for the nylon hose connection fittings) and pivot washers.

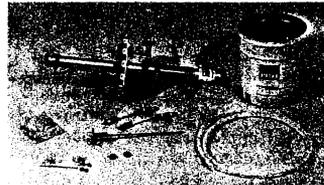


FIGURE 1

2.02 The pump is a reciprocating 1:1 ratio piston displacement type which is pneumatically powered using dry air or nitrogen. The pump operates from 60 to 125 psi pressure; however, full pressure will not be required unless the compound has thickened as the result of being exposed to temperatures of below 15°C (59°F) or has thickened due to extremely high temperature in which the compound has started to gel prematurely.

2.03 Other tools required are: (see Figure 2) a G-30 Mini-Inline Regulator, a G41 3/8" Air drill, A G-42 3/8" Drill Bit with Stop, a 3" circular wire brush, a G-49 25' Quick Change Hose, and a G-51 5' Quick Change Hose. Replacement parts are: special adapter fittings (G-9642), 1/2" nylon tubing (G-810-7), No. 4, No. 5 injection or vent assembly (G-9644), and pump replacement packing kits (G-810-8).

NOTICE

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except under written agreement.

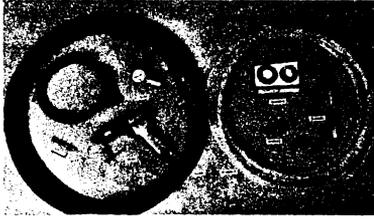


FIGURE 2

3. RP-6018 POLYURETHANE COMPOUND

3.01 RP-6018 Compound is a flexible two component polyurethane. It contains no TDI and has good impact resistance and is compatible with all load coil case components.

3.02 RP-6018 Compound is offered in 1 gallon units (A Pkg.) and 5 gallon units (D Pkg.) with each unit consisting of a container of hardener (Part B) and a properly proportioned container of resin (Part A). (See Figure 3)

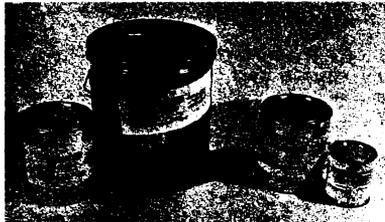


FIGURE 3

3.03 The total amount of compound to be used will depend upon the size of the load coil case. For example, it will take approximately 12 gallons of compound to fill most 455 pair cases.

3.04 In hot weather, keep the RP-6018 Compound as cool as possible. Do not set the compound in direct sunlight. When pumping in hot weather, shade the pump and container to prevent the compound from prematurely gelling. In cold weather, maintain the compound at a temperature above 15°C (59°F).

4. PRECAUTIONS

4.01 This technique for restoring deteriorated load coil cases is designed to minimize the handling of the RP-6018 Compound. While handling and mixing the compound and during cleaning operation, safety goggles shall be worn. Care should be taken to avoid contact with skin. Wash hands immediately with soap and water or waterless hand cleaner if contacted.

5. PREPARATION PROCEDURES FOR VERTICAL LOAD COIL CASES

5.01 Refer to Figure 4 (Page 3) while following the instructions below.

5.02 Clean the top surface of the case to expose the bare metal in the area where the No. 4 and No. 5 valve assembly holes are to be drilled. (Figure 5)

5.03 Place the 3" circular wire brush in the drill motor chuck and tighten securely. Buff the surface area cleaned in Paragraph 5.02 until all traces of tar, scale, and rust have been removed.

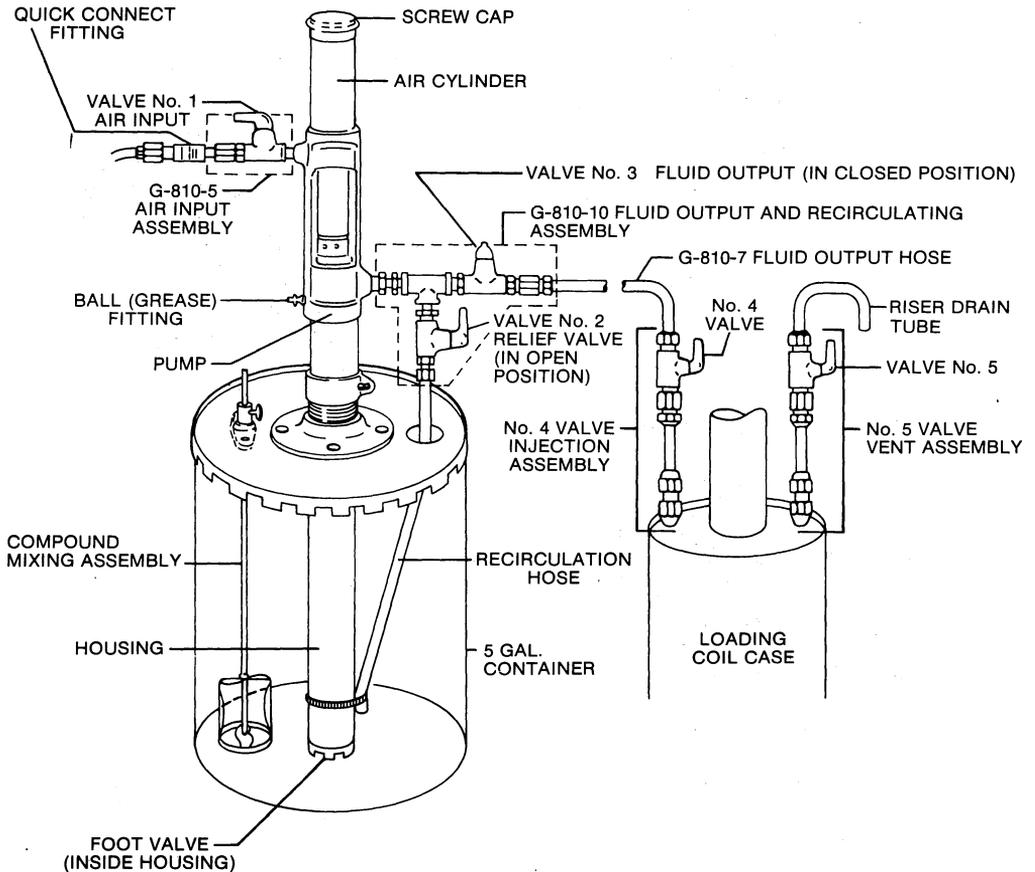


FIGURE 4

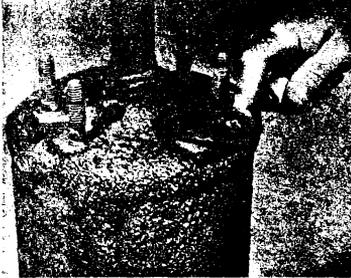


FIGURE 5

5.04 Make two indentations with a steel punch in the top of the case in the previously cleaned area. Make these indentations 1-1/4" in from the case edge and spaced a few inches apart. (Figure 6)

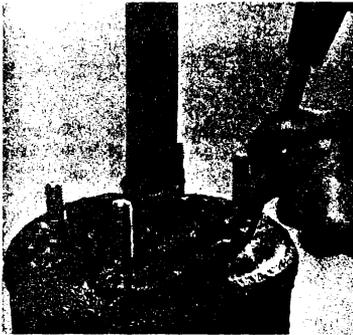


FIGURE 6

NOTE: If it is difficult or impossible to work on the top plate of the load coil case, perform these operations on the side of the case 1-1/4" down from the top lip. In any case, always make certain the intended vent hole is as high on the case as possible.

5.05 Prepare the No. 4 and No. 5 valve assemblies by placing them in the "off" position.

NOTE: The No. 4 injection valve and No. 5 vent valve assemblies should be kept close at hand for immediate installation upon completion of the drilling operation.

5.06 Place two drops of oil in one indentation. Using the G-41 Air Drill and the G-42 Bit (with the bit stop set for a depth of 3/8"), drill through the case housing. (Figure 7)

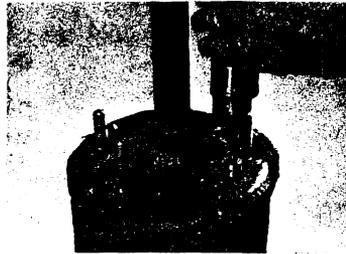


FIGURE 7

5.07 Remove the drill bit from the hole and rapidly place a forefinger over the hole to stop the flow of escaping air. (See Figure 8)

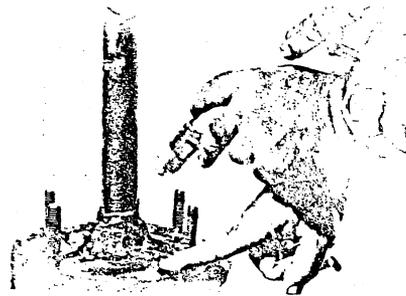


FIGURE 8

NOTE: The special adapter fitting is part of the No. 4 and No. 5 valve assemblies (which are identical) and does not need to be threaded into the drilled hole to make a pressure tight seal.

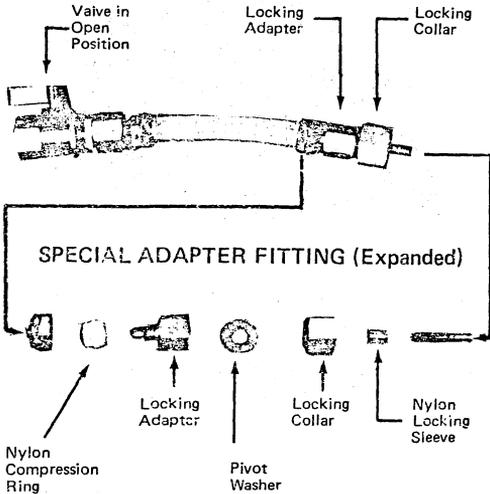


FIGURE 9

5.08 Press the end of the special adapter fitting into this hole to a depth of half of the length of the nylon locking sleeve.

5.09 Secure the fitting in place by holding the locking collar and turning the locking adapter in a clockwise direction by hand until it is tight, then use a wrench to just snug it into position by turning the locking adapter another half turn or so. (See Figure 10)



FIGURE 10

5.10 Repeat Paragraphs 5.08 through 5.09 to install the other valve assembly.

5.11 Attach the riser drain tube to the end of the No. 5 vent assembly. (See Figure 11)



FIGURE 11

5.12 Attach one end of the 1/2" nylon fluid output hose to the No. 4 valve assembly and attach the other end of the hose to the fluid output valve No. 3 on the G-810-LCR Pump. Turn valves No. 2 and No. 3 to a closed position at this time. (See Figure 12)



FIGURE 12

5.13 Close valve No. 1 (air input) and attach an air input hose equipped with a pressure regulator (the G-30 Mini-Regulator) capable of adjustment between 0 and 100 psi.

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NOTE: Refer to Sections 7 and 8 for compound mixing and injecting procedures.

6. PREPARATION PROCEDURES FOR HORIZONTAL LOAD COIL CASES

6.01 Block the case up to as level a position as possible. If the case remains slanted, remember to place the No. 5 valve vent assembly at the highest end of the case.

NOTE: If the case is totally exposed, temporary sealing of the leak must be made. Failure to do this will result in partial filling of the coil case due to the compound flowing out of the case through the leaking area. Temporary repairs may be made using RP-6025, Plastic Steel, etc., in conjunction with a "Compression Bandage" tightly wrapped around or over the patched area.

6.02 The two holes will be drilled on the top side of the case 1-1/4" in from each end. Install the No. 4 and No. 5 valve assemblies as discussed in Paragraphs 5.08 and 5.09.

NOTE: If it is difficult or impossible to place the No. 4 and No. 5 valve assemblies at opposite ends of the case, they may be placed at the same end with the No. 4 valve injection assembly positioned a few inches below the No. 5 valve vent assembly and both 1-1/4" in from the case end.

7. MIXING — RP-6018 COMPOUND

7.01 Pour the smaller container of resin (Part A) into the larger 5 gallon container of RP-6018 hardener (Part B). (See Figure 13)

NOTE: When gallon units of RP-6018 are being used, pour both resin and hardener into a clean 5 gallon container as the one gallon container is unable to accommodate both resin and hardener.

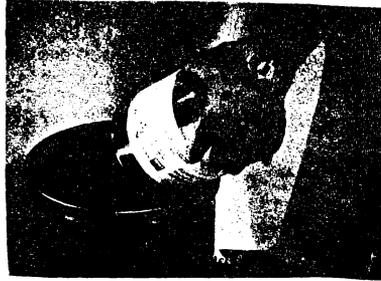


FIGURE 13

7.02 Place the pump into the 5 gallon container of compound.

7.03 Loosen the fitting which holds the rod of the mixing assembly in place and attach the chuck of the Air Drill to the rod. (See Figure 14)

7.04 Operate the Air Drill at 90 psi. As the mixing procedure starts, raise and lower the drill to obtain thorough mixing of the compound. Mix for approximately 5 minutes. Check the appearance of the compound after this time to make certain it is without streaks. When mixing is complete, remove the Air Drill from the mixing assembly rod.

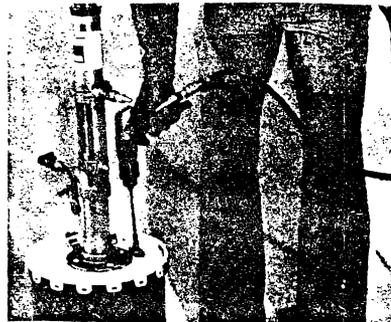


FIGURE 14

NOTE: The compound will thicken in lower temperatures and its mixing and injecting will be slower. Refer to Paragraph 2.02 for temperature considerations and recommendations.

8. INJECTING — RE-6018 COMPOUND

8.01 All valves (No. 1 through No. 5) should be closed at this time.

8.02 Connect the air input hose from the air source to the air input valve No. 1 and set the regulator to 60 psi.

8.03 Open air input valve No. 1 and relief valve No. 2 to prime the pump by running compound through the recirculation hose. After a minute, close valve No. 2 and slowly open fluid output valve No. 3.

8.04 To start injecting compound into the load coil case, first open injection valve No. 4, then crack open vent valve No. 5 slightly to allow the compound to flow into the load coil case with less resistance. (See Figure 15)

NOTE: Care should be taken not to open the vent valve too much so air pressure will not be lost from the case.

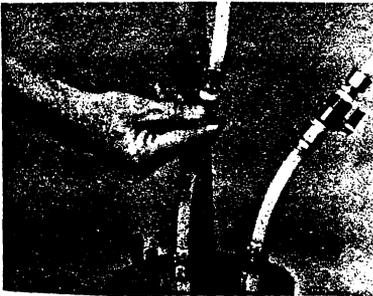


FIGURE 15

NOTE: Check all connections for any leakage.

8.05 Gradually increase the regulator pressure to 90 psi to provide increased flow of compound into the case.

8.06 If a second batch of compound is required, close valves No. 1, No. 3, and No. 5, mix the second batch as previously instructed in Section 7, and follow the pumping procedures outlined in Steps 8.03 through 8.05.

8.07 When the load coil case is full (indicated by a free flow of compound from vent valve No. 5 and the riser drain tube), shut off valve No. 5. Let the pump continue to run for two or three strokes after closing valve No. 5 in order to force compound into the stub for about 6" beyond the case. (See Figure 16)



FIGURE 16

8.08 Close air input valve No. 1 and injection valve No. 4.

8.09 Open relief valve No. 2 to release the compound back pressure in the fluid output hose, then close fluid output valve No. 3.

8.10 Disconnect the fluid output hose from injection valve No. 4 and place this free end into a container to drain off any retained compound.

8.11 Leave the No. 4 valve injection assembly and the No. 5 valve vent assembly in place on the case for approximately 60-120 minutes (depending on the ambient temperature) until the compound gels. This can be checked by cracking the No. 4 or No. 5 valve slightly to see if there is still a compound flow.

8.12 When the compound has gelled, remove the No. 4 valve assembly by tightening the locking adapter of the special adapter fitting with a wrench until the nylon locking sleeve bulges and becomes loose. Pull out the special adapter fitting and insert a metal plug into the hole by tapping it with a hammer. Repeat this step for the removal of the No. 5 valve assembly. (See Figure 17)

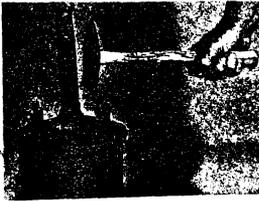


FIGURE 17

NOTE: If it is desired to remove the No. 4 and No. 5 valve assemblies immediately after injecting, the pressure within the case must be relieved. This may be accomplished by momentarily removing the F valve from the adjoining splice case while the No. 4 and No. 5 valve assemblies are being removed and by tapping the metal plugs into place.

8.13 Before leaving the job site, coat the metal plugs and the exposed metal areas on the load coil case with RP-6025 Fast-Weld, an all-purpose, fast setting adhesive and protectant. (See Figure 18)



FIGURE 18

9. CLEANING THE PUMP

9.01 Disconnect the air input hose to the pump.

9.02 Disconnect the fluid output hose from valve No. 3 and drain off any remaining compound in it.

9.03 With the pump removed from the container, depress the small foot valve located inside the bottom of the pump housing to drain the compound from the lower chamber. (See Figure 19)



FIGURE 19

9.04 Tip the pump to a horizontal position and drain the remaining compound from the upper chamber through the opened valve No. 3. Properly dispose of any unused RP-6018 Compound. (See Figure 20)

9.05 Fill the empty 5 gallon container that is provided in the kit with approximately 2 gallons petroleum solvent (KS-21446 L1), then place the pump into this container.

9.06 Reconnect the fluid output hose to valve No. 3 and place the other end of the hose into the cleaning container.

9.07 Reconnect the air input hose to the pump. Close relief valve No. 2 while leaving fluid output valve No. 3 open.

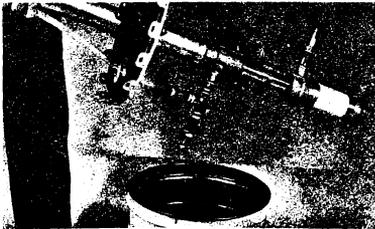


FIGURE 20

9.08 Set the regulator pressure to about 30 psi, then open air input valve No. 1 and flush the cleaning solvent for two minutes through valve No. 3 and the fluid output hose. Close valve No. 1 after this period of time.

9.09 Close fluid output valve No. 3 and remove the fluid output hose from it.

9.10 Open relief valve No. 2 and air input valve No. 1 to circulate cleaning solvent for five minutes through valve No. 2 and the recirculation hose. (See Figure 21)

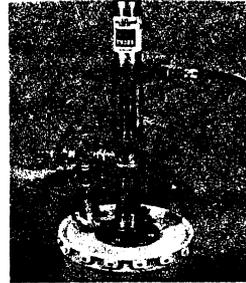


FIGURE 21

9.11 Disconnect the air source from the pump. Disconnect the recirculation hose from valve No. 2 and remove it from the container. Leave valves No. 2 and No. 3 wide open.

9.12 Remove the pump from the cleaning container and again depress the foot valve to drain the solvent from the chamber. Tip the pump to a horizontal position to drain the upper portion through valves No. 2 and No. 3.

9.13 Empty the cleaning solvent from the cleaning container. The solvent must be disposed of in accordance with local practices on the disposal of flammable material.

9.14 Clean the gelled RP-6018 Compound from the No. 4 and No. 5 valve assemblies with the cleaning rod. Replace the used nylon locking sleeve with a new one in preparation for the next job.

9.15 With a dry cloth, wipe clean the pump, associated attachments, and the cleaning container.

9.16 Coil the fluid output hose and place it in the cleaning container, then place the pump in the packaging carton for proper transportation and storage.

10. PUMP MAINTENANCE

10.01 When using dry nitrogen, periodically place 15 drops of light oil into the air input port where the quick-connect fitting is attached. This provides lubrication for the driving piston, seals, and "O" rings.

10.02 Periodically lubricate the ball (grease) fitting.

10.03 Should the leather packings on the pump become worn, order the G-810-8 Pump Replacement Packing Kit and install them in the following manner:

- (a) Remove cotter pin and unscrew connecting rod from connecting tube.
- (b) Remove air cylinder from base, loosen packing nut, and carefully pull connecting tube from top of base (see Figure 22).
- (c) Remove packing retainer from bottom of base.
- (d) Remove packing nut and push bearing gland and packings from bottom of base.
- (e) Clean and inspect all parts for damage or wear. Replace as necessary.
- (f) Soak new leather packings in light oil until flexible.
- (g) Push gland and packings one by one into base and hand tighten packing retainer.
- (h) Install packing nut loosely, lubricate connecting tube, and carefully slide it through packings and base.

- (i) Draw up packing nut snugly; do not over-tighten.
- (j) Reassemble remaining parts, reverse from disassembly.

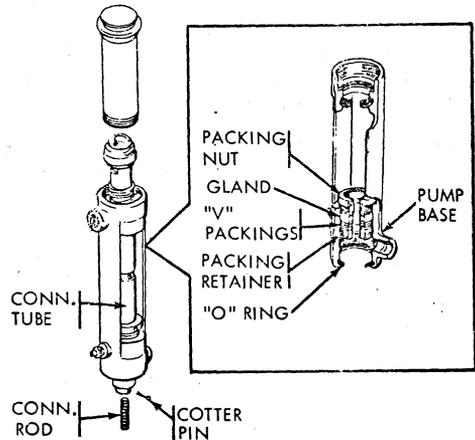


FIGURE 22

10.04 After considerable usage of the pump, "weepage" of fluid may drip from hole or tube in bottom of pump base or such "weepage" may occur at the throat packing nut. This is normal for this type of pump and does not impair the efficiency or the operation of the unit.

10.05 Should the pump stop during a pump cycle, it is possible that the reversing valve in the driving piston chamber is not making contact with the piston. This can be corrected by tightening the screw cap on top of the pump or by turning the air cylinder further down into the housing. In either case, all that is usually required is approximately an 1/8 to 1/2 turn.