



GAI-TRONICS®
A HUBBELL COMPANY

Keypad Replacement Kit for Model 491-204 Mine Dial Page Telephone

Model 12504-012

Confidentiality Notice

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General Information

The Model 12504-012 Keypad Replacement Kit for the Model 491-204 Mine Dial Page Telephone includes the following components:

Qty	Description
1	Keypad assembly
1	Keypad seal
1	Resistor, 100-ohm, 3-watt, wire wound or metal film
3	Cable tie-wraps

Installation

Tools Required

- 5/16-inch nut driver
- 1/4-inch nut driver
- Phillips screwdriver
- Wire cutter
- Razor knife

 **CAUTION**  This upgrade replacement kit may only be installed by a GAI-Tronics technician or by a GAI-Tronics authorized service center. Installation by any other service center or personnel will void MSHA approval.

 **WARNING**  Substitution of components may impair intrinsic safety.

R104 located on No. 69491-002 Amplifier PCBA must be a 3-watt wire wound or metal film resistor to maintain MSHA approval. See Figures 1, 2, 3 and 4 to give a visual aid to identify and determine if the PCB assemblies were modified.

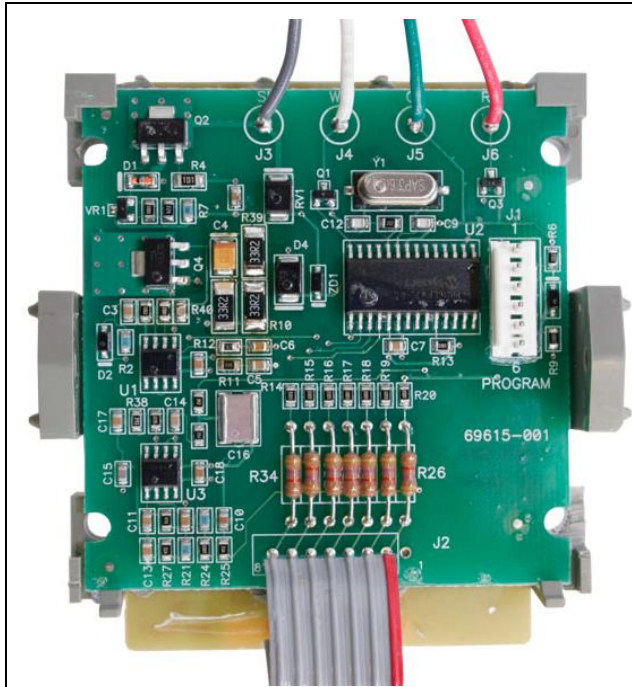


Figure 1. Keypad PCB Assembly 69615-001
BEFORE Modifications

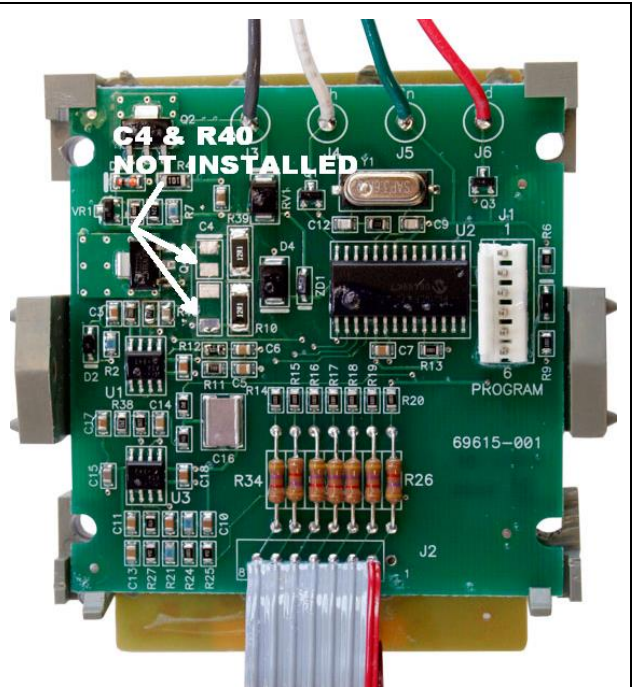


Figure 2. Keypad PCB Assembly 69615-001
AFTER Modifications

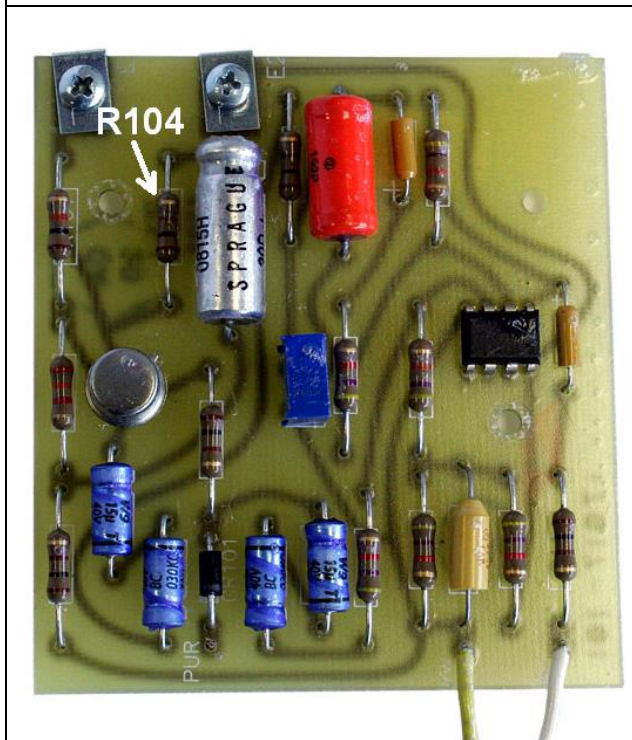


Figure 3. Amplifier PCB Assembly 69491-002
BEFORE R104 Modification

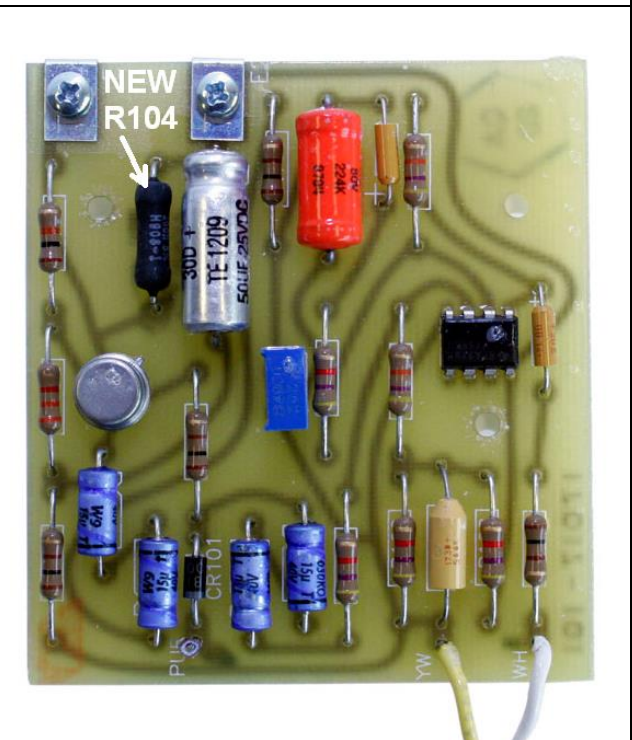


Figure 4. Amplifier PCB Assembly 69491-002
AFTER R104 Modification

Procedure

1. Disconnect the mine dial page phone's telephone line connection from the communication system.
2. Open the enclosure and disconnect both wires from the positive terminal of the battery.
3. Take note of the positioning of the tie-wraps securing the keypad and wires of the No. 69491-002 Amplifier PCB assemblies. Wires **MUST** be routed and secured to prevent contact with uninsulated conductors. Securing the wiring in the same fashion will be required at completion.
4. Cut each tie-wrap that is holding the keypad wires and the No. 69491-002 Amplifier wires to the enclosure wiring harness. Using a Phillips screwdriver, loosen all of the screws to remove the keypad wires from terminal block TB2 and terminal E1 on the No. 69491-002. Re-tighten all loosened screws to ensure that all other wires remain connected to the appropriate locations. See Figure 5.

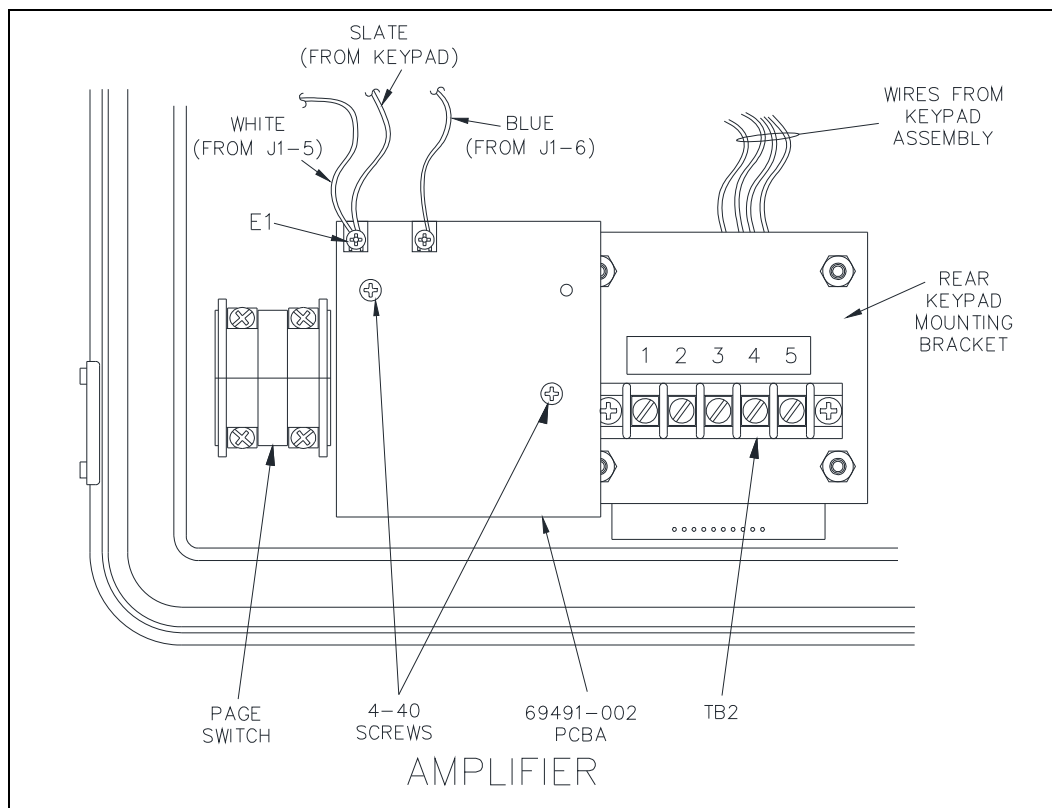


Figure 5. Keypad Removal

69491-002 Modification for Maintaining Intrinsic Safety (Used in conjunction with keypad PCBA modification)

5. Remove the two 4-40 screws securing the No. 69491-002 Amplifier PCBA. Save the screws for re-assembly.
6. On the No. 69491-002 Amplifier PCBA, locate R104, which is adjacent to C101 and E2. Refer to Figure 3.
7. De-solder and remove resistor R104 (100-ohm resistor, 1/2-watt).
8. Install the new resistor R104 (100-ohm resistor, 3-watt). Re-solder and trim the leads.
9. Re-coat the PCBA around R104's soldered connections with an approved moisture resistant film. Table 1 lists the approved coatings.
10. Swing the amplifier PCBA out of the way for access to the keypad assembly.

Table 1. Approved Moisture Resistant Films

Manufacturer	Part Number and Description	Manufacturer	Part Number and Description
John C. Dolph Co.	AC-46 Polyurethane Varnish	Humiseal	1B73-LOC Acrylic Resin
	T-200 Thinner		701 Thinner
	T-200X Thinner		

Keypad Assembly Replacement

11. Remove the four hex nuts on the rear keypad mounting bracket using a 5/16-inch nut driver. Save the hex nuts for re-assembly.
12. Lift the rear keypad mounting bracket to expose the keypad assembly. Remove the four ¼-inch hex standoffs using a ¼-nut driver. Save the hex standoffs for re-assembly.
13. The front keypad mounting panel can now be pulled away from the keypad assembly from the front of the enclosure.
14. Lift the aluminum keypad spacer off of the front keypad mounting panel to expose the keypad seal. See Figure 6. Save the keypad spacer for re-assembly.
15. Pull the keypad seal off of the front keypad mounting panel and dispose of the old seal.
16. Press the new keypad seal into the front keypad mounting panel as shown in Figure 6. Make sure that each key extrusion of the seal is seated fully into the front keypad mounting panel.

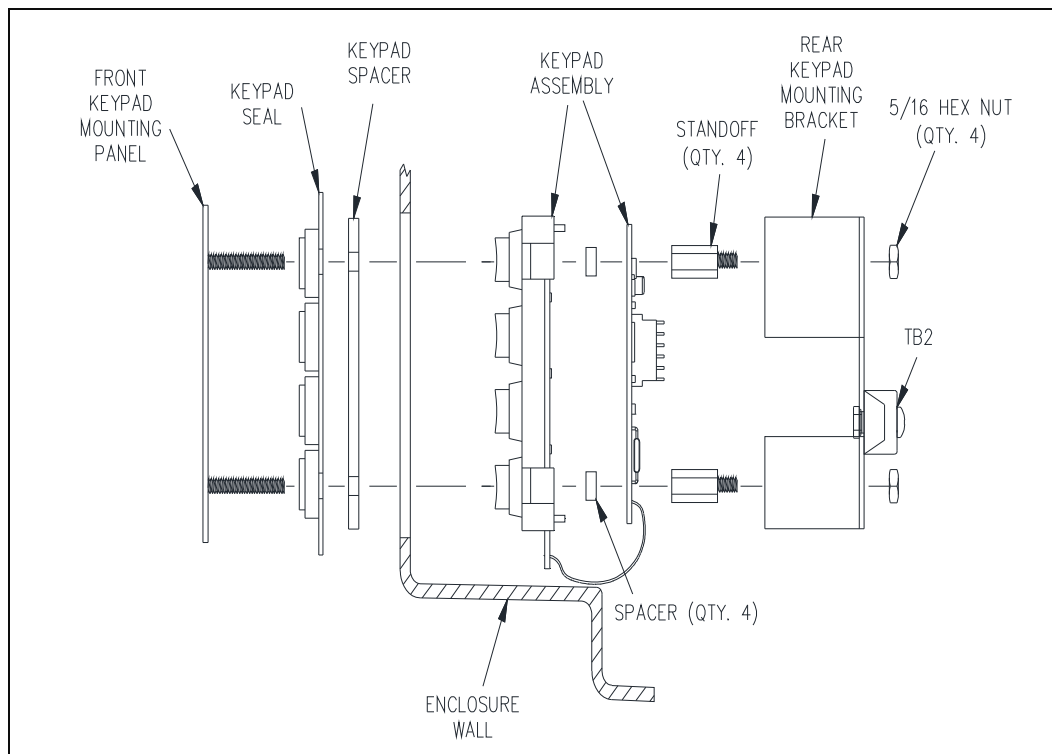


Figure 6. Keypad Assembly

17. Place the aluminum keypad spacer onto the front keypad mounting panel to cover the keypad seal.

18. Place the front keypad panel back into the front of the enclosure making sure that the keypad spacer seats in the opening of the enclosure. Hold the front keypad mounting panel in place and from the inside of the enclosure, place the new keypad, four spacers, and PCBA over the front keypad mounting panel studs. Use the four 1/4-inch hex standoffs to secure the keypad assembly to the studs. Tighten the hex standoffs.
19. While holding the front keypad panel and keypad assembly in place, put the rear keypad mounting bracket over the hex standoffs. Ensure that the four wires from the keypad assembly exit out of the top (speaker side) of the rear keypad mounting bracket. See Figure 5. Use the four 5/16-inch hex nuts to secure the rear keypad mounting bracket. Tighten the nuts by using an "x" pattern to ensure uniform compression of the front keypad panel.
20. Re-install the No. 69491-002 Amplifier PCBA using the two Phillips head screws.
21. Reconnect the four wires from the keypad assembly as follows:
 - Connect white wire to terminal three of TB2.
 - Connect green wire to terminal four of TB2.
 - Connect red wire to terminal five of TB2.
 - Connect slate wire to terminal screw E1 on the No. 69491-002 Amplifier PCBA.
22. Re-secure the wiring as noted in Step 3 using the supplied tie-wraps. Wires MUST be routed and secured to prevent contact with uninsulated conductors. Refer to Figure 7 as an example.

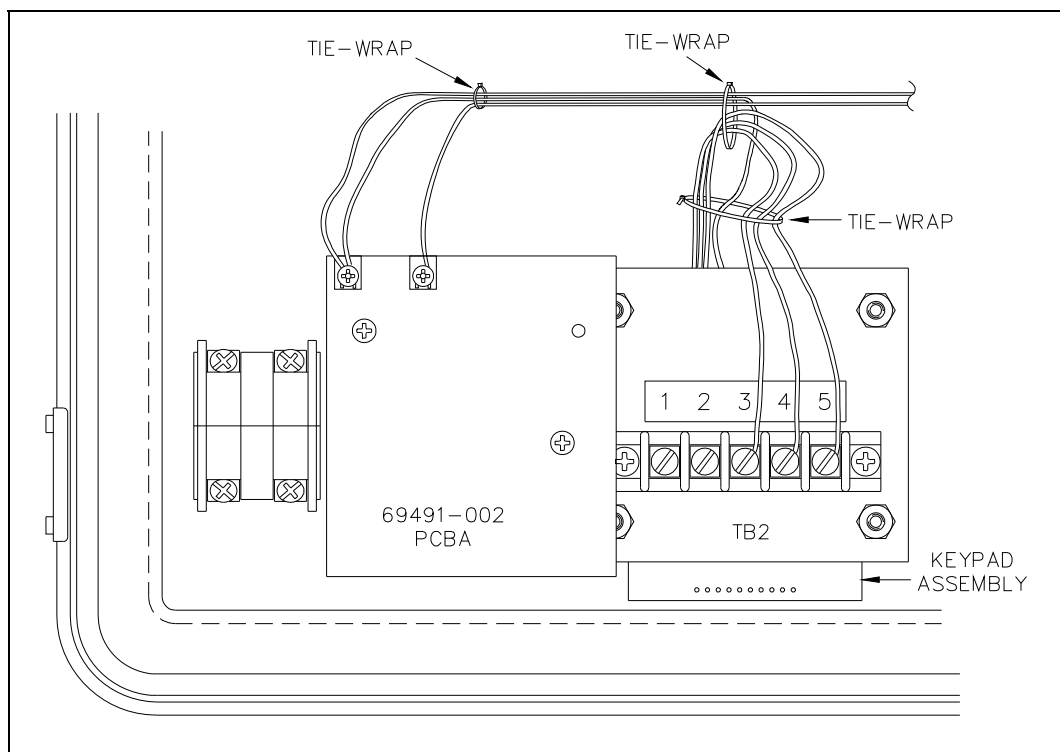


Figure 7. Tie-Wrap Location Example

23. Check all work, then reconnect both wires to the internal battery's positive terminal. Test the keypad for proper operation.
24. Using a razor blade knife, trim the excess gasket material along the top and bottom edges of the front keypad mounting panel.

Warranty

Equipment. GAI-Tronics warrants for a period of one (1) year from the date of shipment, that any GAI-Tronics equipment supplied hereunder shall be free of defects in material and workmanship, shall comply with the then-current product specifications and product literature, and if applicable, shall be fit for the purpose specified in the agreed-upon quotation or proposal document. If (a) Seller's goods prove to be defective in workmanship and/or material under normal and proper usage, or unfit for the purpose specified and agreed upon, and (b) Buyer's claim is made within the warranty period set forth above, Buyer may return such goods to GAI-Tronics' nearest depot repair facility, freight prepaid, at which time they will be repaired or replaced, at Seller's option, without charge to Buyer. Repair or replacement shall be Buyer's sole and exclusive remedy. The warranty period on any repaired or replacement equipment shall be the greater of the ninety (90) day repair warranty or one (1) year from the date the original equipment was shipped. In no event shall GAI-Tronics warranty obligations with respect to equipment exceed 100% of the total cost of the equipment supplied hereunder. Buyer may also be entitled to the manufacturer's warranty on any third-party goods supplied by GAI-Tronics hereunder. The applicability of any such third-party warranty will be determined by GAI-Tronics.

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Warranty Periods. Every claim by Buyer alleging a defect in the goods and/or services provided hereunder shall be deemed waived unless such claim is made in writing within the applicable warranty periods as set forth above. Provided, however, that if the defect complained of is latent and not discoverable within the above warranty periods, every claim arising on account of such latent defect shall be deemed waived unless it is made in writing within a reasonable time after such latent defect is or should have been discovered by Buyer.

Limitations / Exclusions. The warranties herein shall not apply to, and GAI-Tronics shall not be responsible for, any damage to the goods or failure of the services supplied hereunder, to the extent caused by Buyer's neglect, failure to follow operational and maintenance procedures provided with the equipment, or the use of technicians not specifically authorized by GAI-Tronics to maintain or service the equipment. **THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE IN LIEU OF AND EXCLUDE ALL OTHER WARRANTIES AND REMEDIES, WHETHER EXPRESS OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

Return Policy

If the equipment requires service, contact your Regional Service Center for a return authorization number (RA#). Equipment should be shipped prepaid to GAI-Tronics with a return authorization number and a purchase order number. If the equipment is under warranty, repairs or a replacement will be made in accordance with the warranty policy set forth above. Please include a written explanation of all defects to assist our technicians in their troubleshooting efforts.

Call 800-492-1212 (inside the USA) or 610-777-1374 (outside the USA) for help identifying the Regional Service Center closest to you.