GE Fanuc Automation

P.O. Box 8106
Charlottesville, VA 22906

GFZ–0085

GE Fanuc Automation

Programmable Control Products

Series 90™–30 Programmable Controller

Troubleshooting Guide

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GFZ–0085 *August 1993*

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Notice

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Modelmaster	Series Three	VuMaster
ProLoop	CIMPLICITY PowerTRAC	Series Five
Workmaster	Genius Power TRAC	

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Safety Considerations

General Warnings When Troubleshooting

Stand clear of controlled equipment when power is applied. If the problem is intermittent, sudden unexpected machine motion could occur, causing injury. Also reference NFPA 70E Part II for additional guidelines for safety practices.

Never reach into a machine to operate a switch since unexpected motion could occur, causing injury.

Remove all electrical power at the Main Power Disconnect to ensure total power removal.

Always remove power before inserting or removing modules, or before connecting I/O cabling.

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Preface

This guide describes a logical sequence for troubleshooting your Series 90–30 programmable controller. It includes the procedure for changing or adding a EPROM or EEPROM to your CPU. The Series 90–30 PLC is a member of the Series 90™ family of programmable logic controllers from GE Fanuc Automation.

Revisions to this Troubleshooting Guide

This is the first release of this Troubleshooting Guide. Included are models CPU 311, 313, 321, 323, 331 and 341.

Related Publications

Series 90™–30 Programmable Controller Installation Manual (GFK–0356).

Series 90™–30 and 90–20 PLC Hand–Held Programmer User's Manual (GFK–0402)

Logicmaster™ 90 Series 90–30 and 90–20 Programming Software User's Manual (GFK–0466)

Series 90™–30/90–20 Programmable Controllers Reference Manual (GFK–0467)

We Welcome Your Comments and Suggestions

At GE Fanuc Automation, we strive to produce quality technical documentation. After you have used this troubleshooting guide, please take a few moments to write us with your comments and suggestions. Our address is: Manager Technical Publications, GE Fanuc Automation. PO Box 8106, Charlottesville, VA 22906

Drake C. Fink

Sr. Staff Systems Engineer

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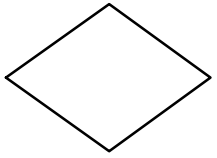
SYMBOLS USED IN THIS GUIDE

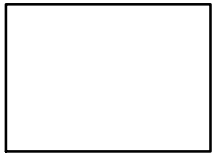
BEGIN AT THIS SYMBOL ON THE FIRST CHART.

FOLLOW THE PATH WITH THE CORRECT ANSWER IN THE DIRECTION OF THE ARROW

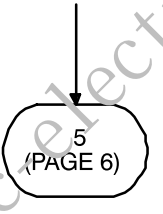
SYMBOLS USED THROUGHOUT THE GUIDE ARE GEOMETRICALLY CODED



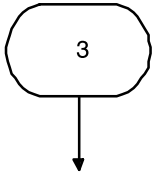
A DIAMOND ASKS A QUESTION



A RECTANGLE TELLS YOU TO DO SOMETHING



A NUMBERED BUBBLE WITH AN ARROW INTO THE BUBBLE INDICATES THAT THE PROCEDURE IS CONTINUED AT A CORRESPONDINGLY NUMBERED BUBBLE ON THE INDICATED PAGE NUMBER.



A NUMBERED BUBBLE WITH AN ARROW OUT OF THE BUBBLE INDICATES THE START OF A PROCEDURE ON THAT PAGE.I

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Adding or Changing the EEPROM in the 90™–30

Application programs are normally developed in the CPU's RAM memory and executed from RAM memory. If additional program integrity is desired, or operation of the PLC without a battery is desired, an optional EEPROM or EPROM can be installed in a spare socket (labeled PROGRAM PROM) on the Model 311/313 backplane or in a socket on the model 331/341 CPU module. EEPROMs can be written to and read from. EPROMs can be read when installed in the PLC; however, they must be written to using an external PROM programming device.

Following is the procedure for adding or changing the EEPROM or EPROM. For clarity, the term PROM is used to refer to either an EEPROM or an EPROM.

1. Remove power from the system.
2. If 311/313
   - Remove all modules, including the power supply.
   - Remove the plastic cover.
3. If 331/341:
   - Remove CPU from backplane.
   - Remove front plate and bezel. Unsnap circuit board and remove from case.
4. If the socket is the type which has a screw near the top edge (some versions of 311/331), loosen screw at top of PROM socket (CCW twist;).
5. If present, remove old PROM from socket. Replace with or install new PROM. Orient the PROM so the end with a notch (the top of the prom) is toward the top edge of the backplane. Pin 1 of the prom is the first pin on the left as you move counter–clockwise from the notch. On the 311/331, correct installation orients the notch toward the screw.
6. When present, tighten screw at top of PROM socket (CW twist).
7. If 311/313:
   - Replace the plastic cover.
   - Replace all modules, including the power supply.
8. If 331 CPU:
   - Assure jumper JP1, located at the bottom of the PROM socket, is in the 1–2 position for EPROM and the 3–2 position for EEPROM. This informs the CPU firmware which type of device is present.
9. If 331/341 CPU:
   - Replace circuit board in case.
   - Reinstall front plate and bezel.
   - Replace CPU in backplane.

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Changing the EEPROM (continued)

10. Apply power. The PLC follows the flowchart found in the ”Power–Up Sequence” figure in the Power–Up and Power–Down Section of the *Series 90–30/90–20 Programmable Controllers Reference Manual* (GFK–0467) to determine if a program will be loaded from PROM to RAM.

11. For the EEPROM to be used by the CPU, the CPU configuration must be set to use EEPROM as the ”Program Source”. You may use the LM90 Configuration software or the HHP to accomplish this.

12. To store the program in RAM, you may use either the Hand–Held Programmer or Logicmaster 90–30, Rev 3.5 or higher. Refer to the instructions in the *HHP User's Manual* (GFK–0402) for HHP. To use Logicmaster 90–30, follow these instructions:

- Start the LM90–30 Programmer Package
- Activate the Utilities Menu (F9)
- Select the EEPROM function (F10)
- Select the WRITE operation
- Verify the items you want to write to EEPROM are selected.
- Press ENTER to start the operation. Refer to the *Logicmaster 90 Series 90–30 and 90–20 Programming Software User's Manual* (GFK–0466) for more information.

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Notes and Precautions

1. **WARNING**: Do not discard the lithium–manganese dioxide battery in fire. Do not attempt to discharge the battery. The battery may burst or burn or release hazardous materials. Dispose of the battery as you would any hazardous material.

2. **CAUTION**: After a power fault, the system will come back on in the mode (*STOP, RUN/ENABLED, RUN/DISABLED)* in which it was operating before power loss, unless the power up configuration specifies a particular mode.

3. Not having a battery installed will not prevent the PLC from running. It will generate a PLC fault on power cycle that prevents the PLC from entering *RUN* mode automatically. Clearing this fault will enable the PLC to be placed in *RUN* mode.

4. To short the 'super cap' on a 311/321 PLC:

   - Remove power from the system.
   - Remove all modules, including the power supply.
   - Remove the plastic face plate.
   - Find component C20 along the left edge of the module. This is the 'super cap'. Short the positive (+) and negative (–) leads of this device.
   - Replace the plastic face plate.
   - Replace all modules.
   - Restore power to the system.

5. Supply (input) voltage tolerances for Series 90–30 power supplies:

IC693PWR321:	100 to 240 VAC 100 to 250 VDC (125 VDC nominal)
IC693PWR322:	18 to 56 VDC, 21 VDC minimum to start 24 VDC OR 48 VDC nominal

6. Total cable length must not exceed 50 feet between a CPU rack and an expansion rack. Length must not exceed 700 feet between a CPU rack and a remote rack. No termination plug is needed on a one–rack system.

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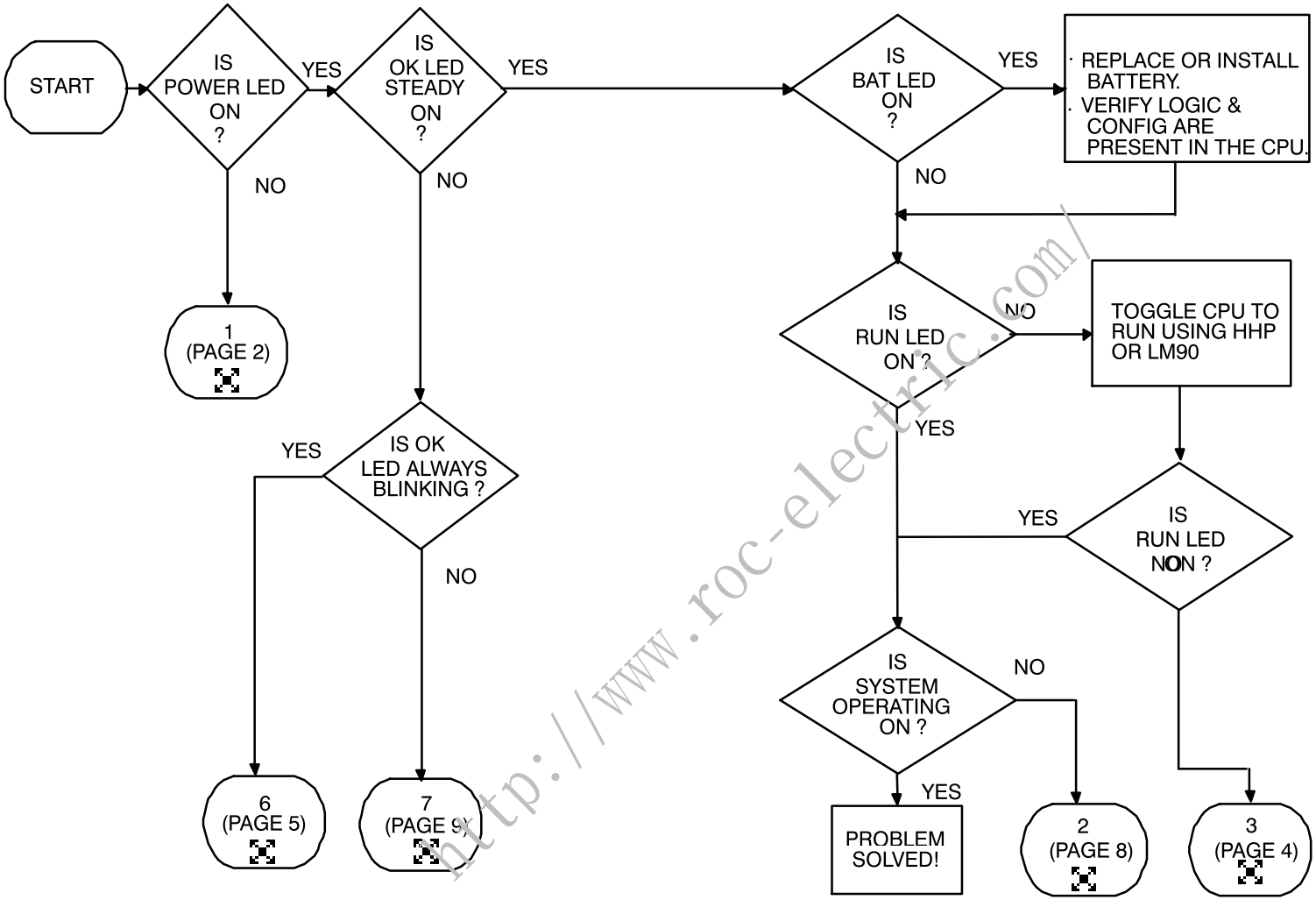

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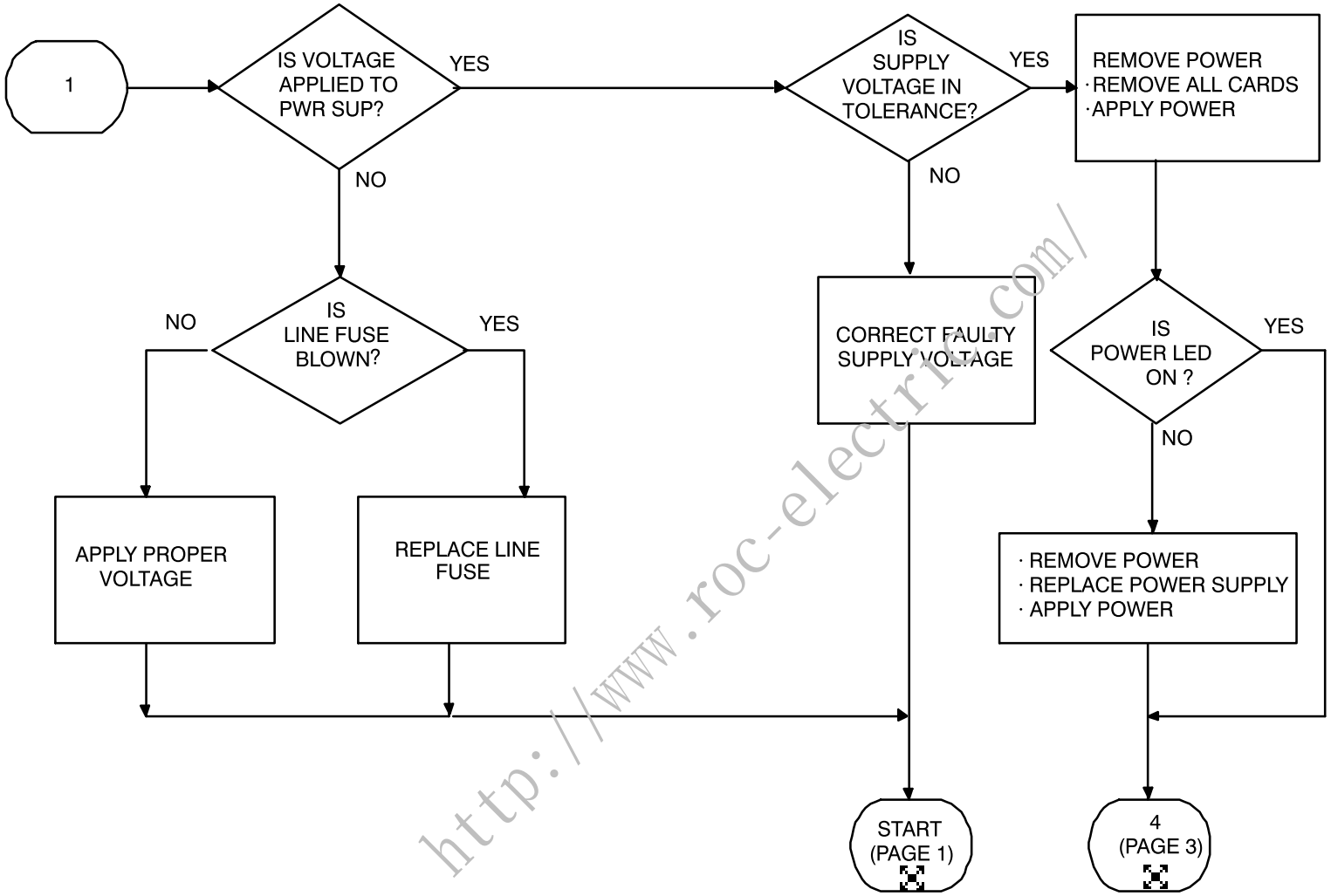
(Refer to the Preface for information on safety considerations, related publications and the symbols used in this guide.)



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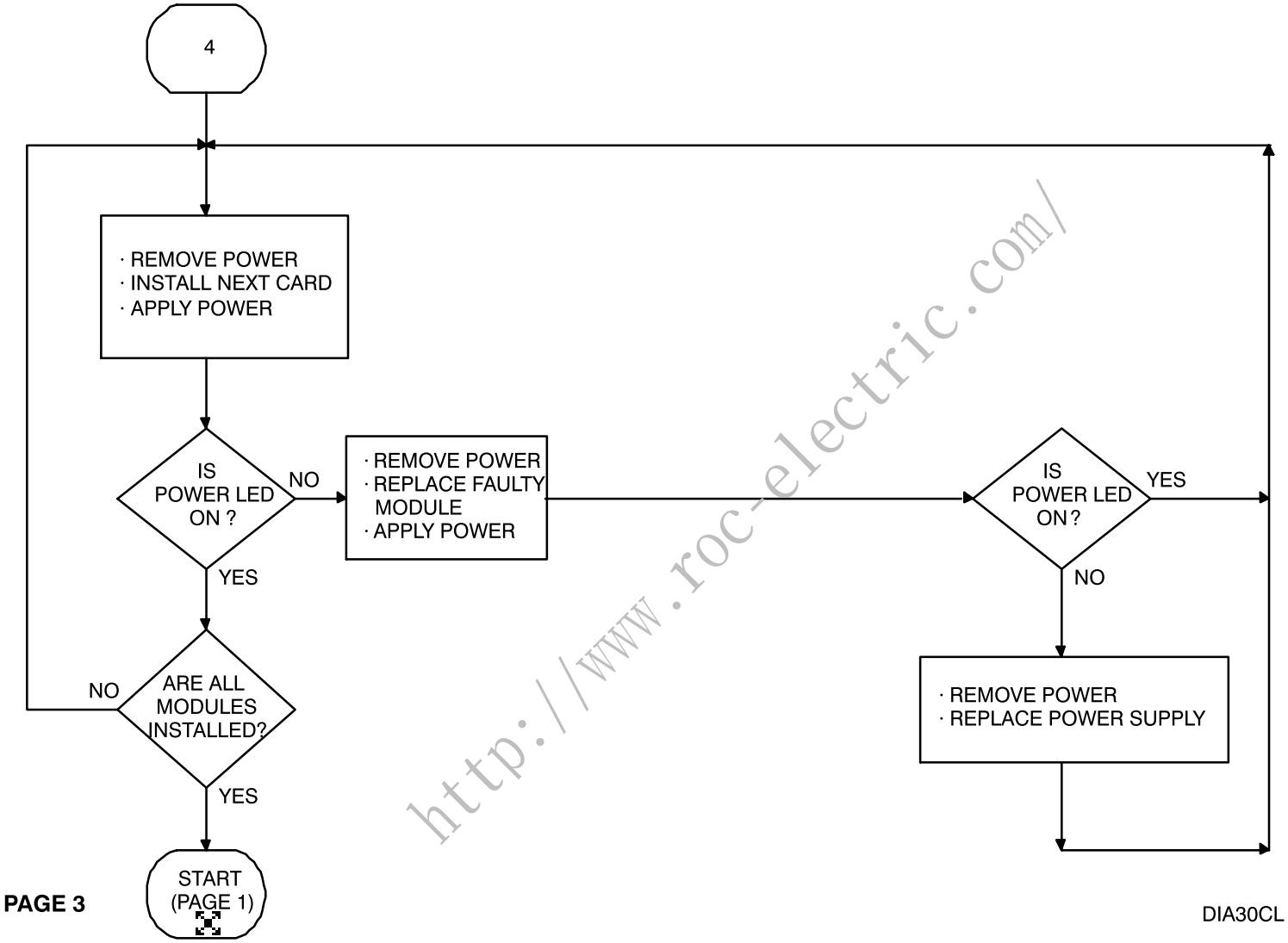

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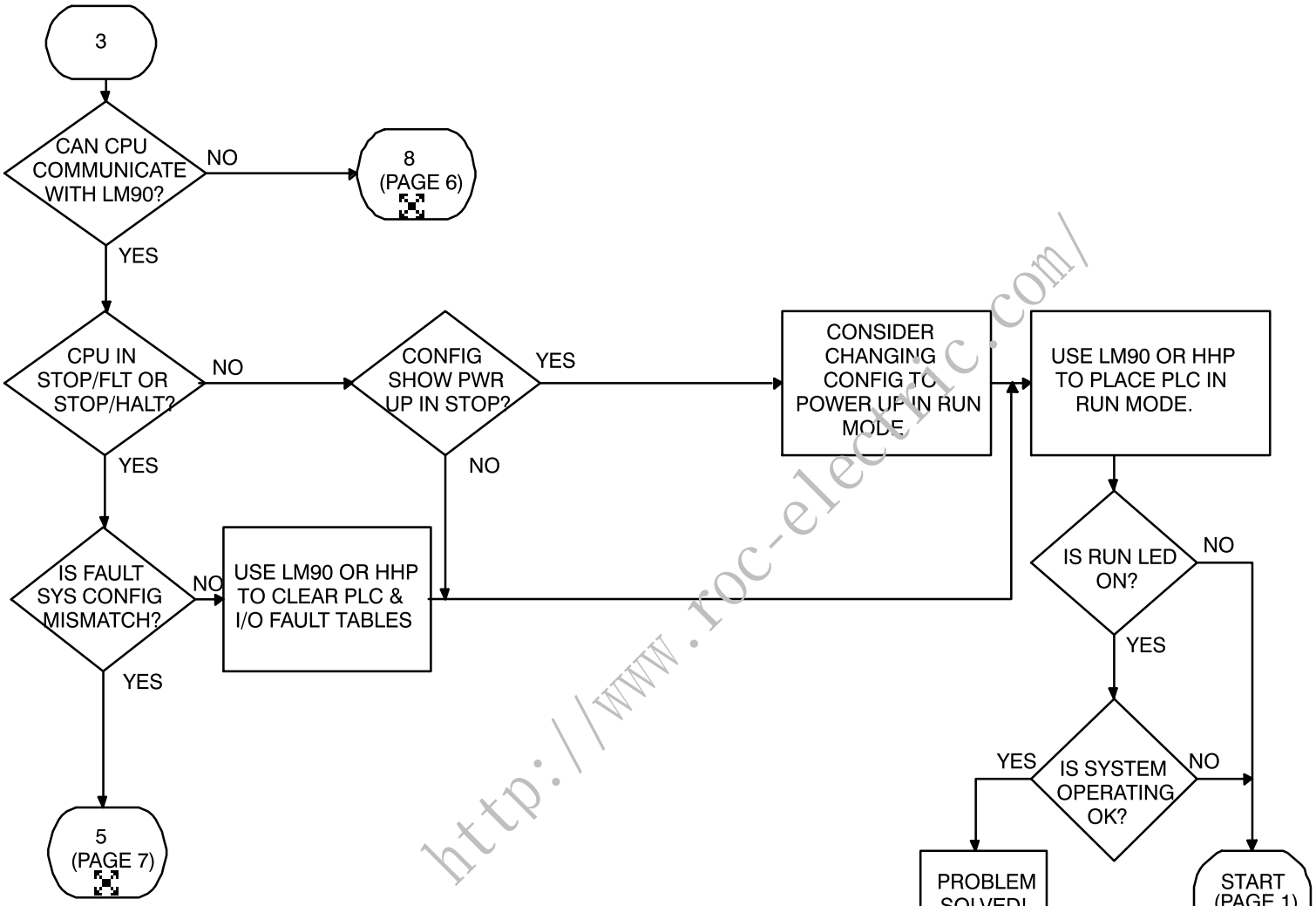

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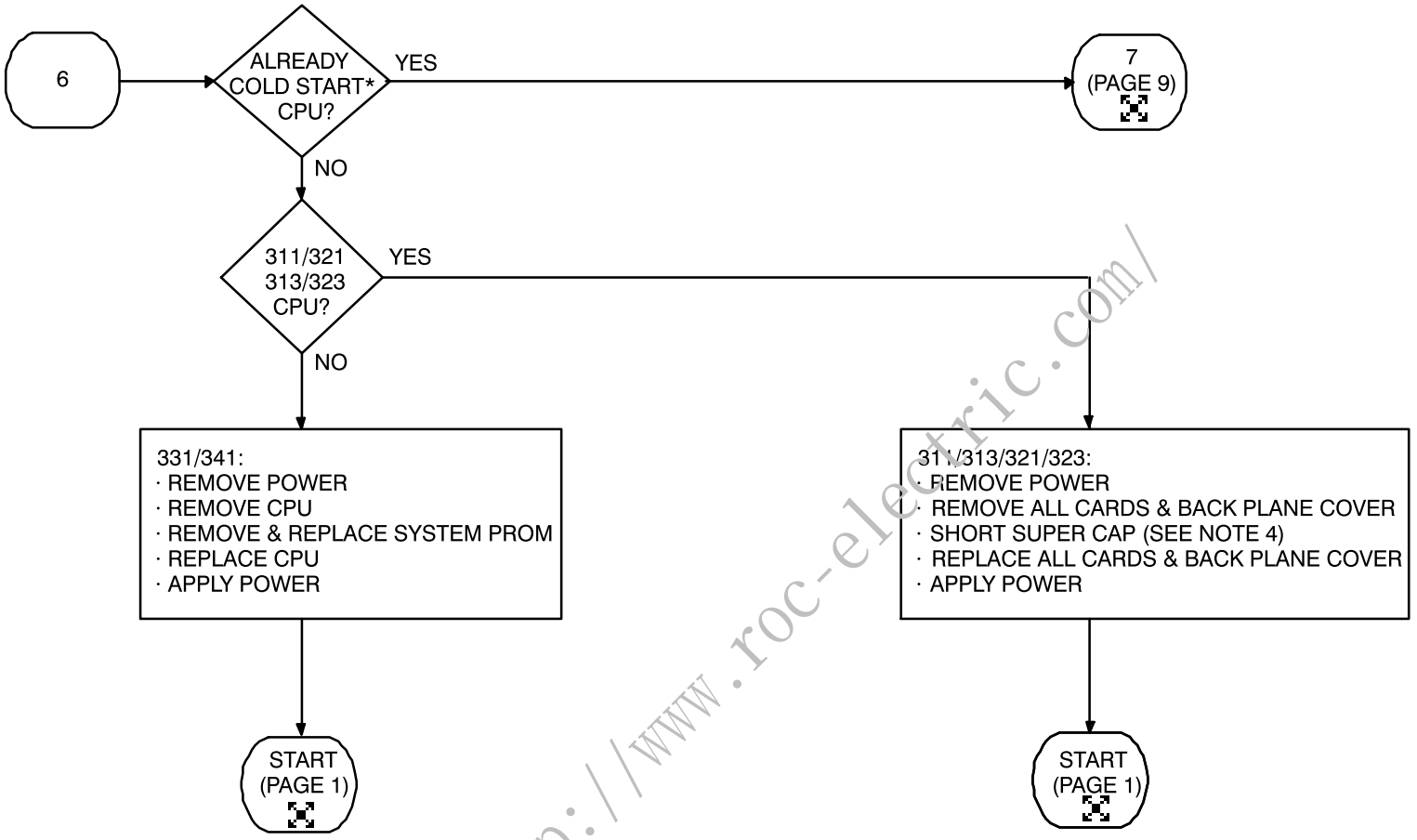

*COLD START DELETES THE CONTENTS OF THE CPU'S MEMORY AND RESTORES COMMUNICATION PARAMETERS (BAUD RATE, PARITY, ETC.) TO THEIR DEFAULT VALUES.

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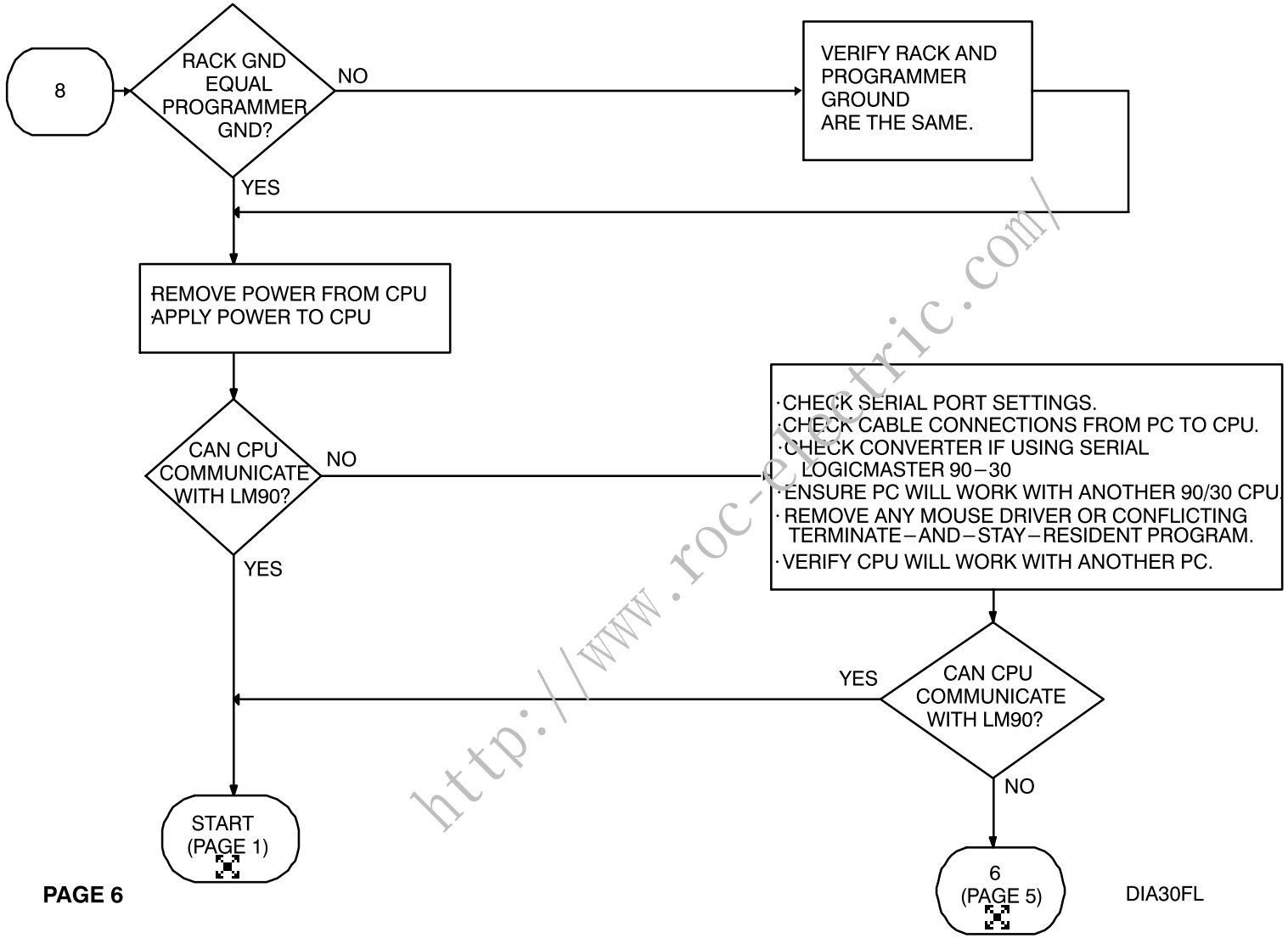

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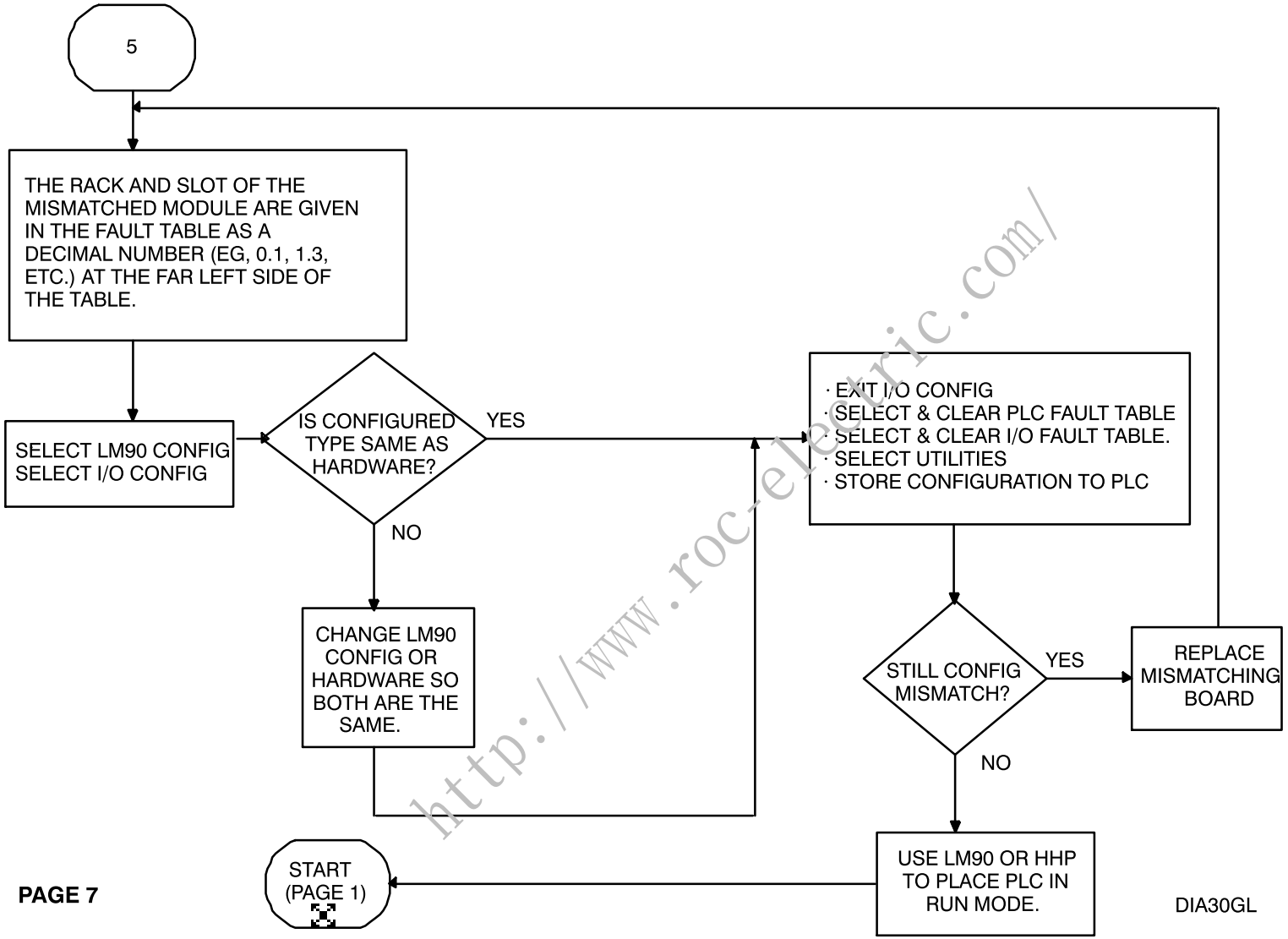

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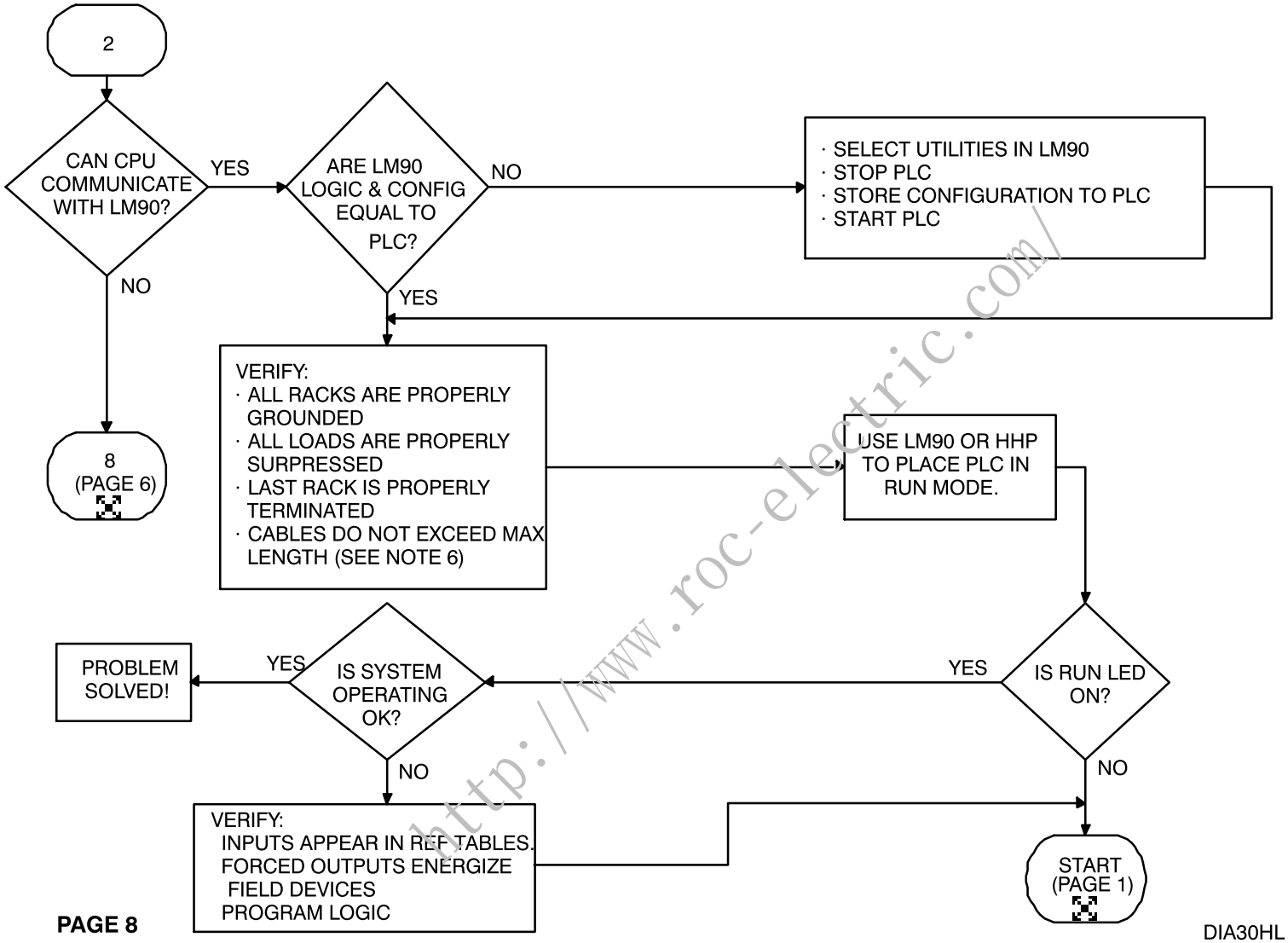

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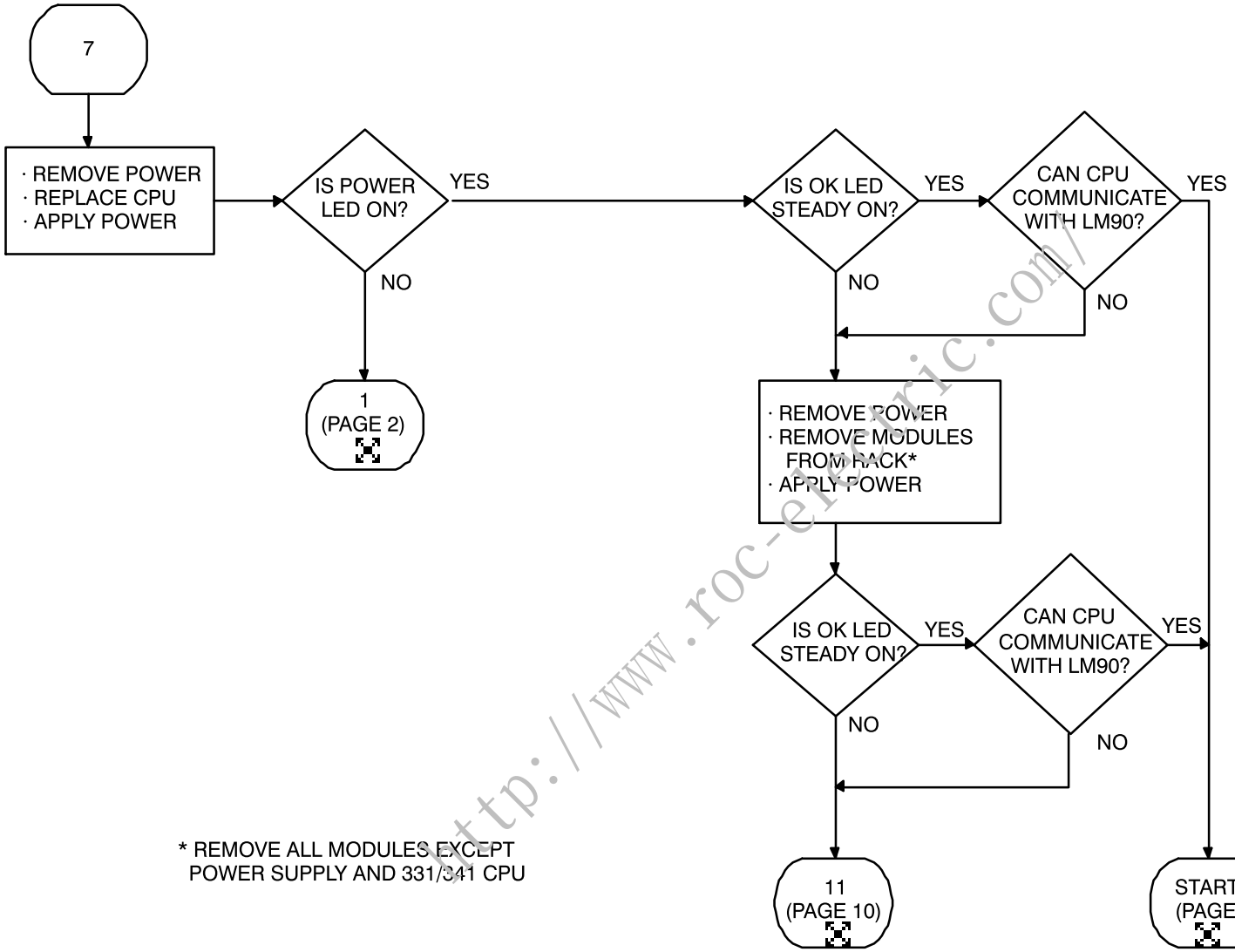

* REMOVE ALL MODULES EXCEPT POWER SUPPLY AND 331/341 CPU

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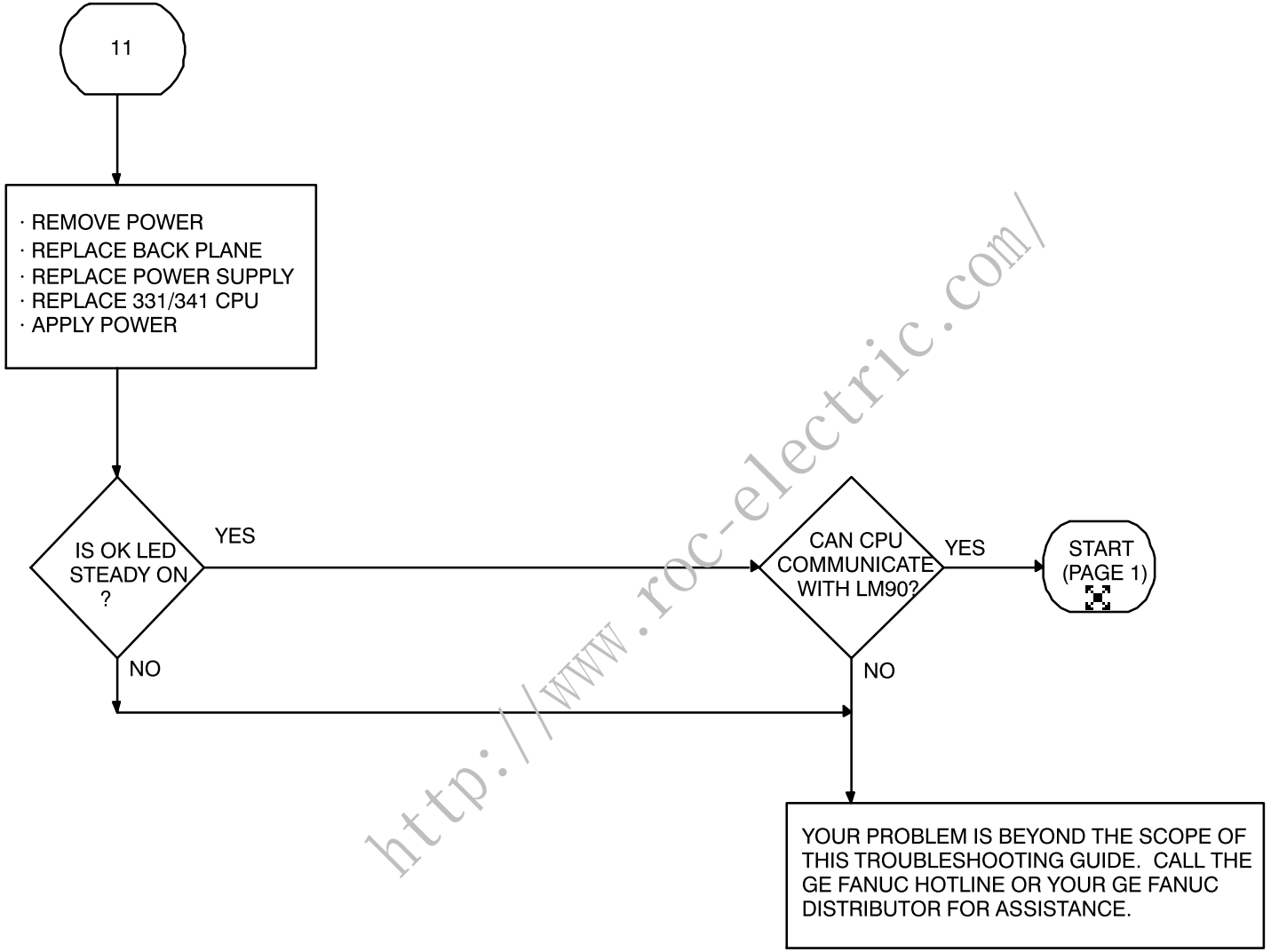

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