



## T2000 Electrical System

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### Description

#### Central Electric Panel (CEP)

The Central Electric Panel (CEP) is the power distribution system for the entire vehicle. Access to the CEP is gained by lifting out the glovebox on the passenger side.

*NOTE: The light that illuminates the glovebox also illuminates the CEP for ease of service.*

The CEP is found on the instrument panel harness for all engines. The CEP consists of modular E-block components. The CEP contains

- 3 high current relay modules and spacers
- 4 ATO fuse modules and modified spacers

*NOTE: The ATO fuse modules have a modified spacer so that they will accept a 2-way connector designed specifically for this system. The 2-way connectors plug into the ATO fuse modules acting as power points for possible future harnesses and for dealer add-ins.*

- 3 ISO relay modules and spacers
- 2 multi-modules and spacers
- (1) 41 cavity mini fuse module and spacer
- 33 yellow wedges

### System Overview

The entire fusing system is fed by 4 power feeds

- P81BB, the clean power feed
- P82BB, the battery feed
- P5IKS, the accessory feed
- P113BB, the ignition feed

The clean power and battery circuits supply continuous power while the accessory and ignition circuits only supply power while the key switch is in the accessory or ignition position respectively.

The T2000 electrical system is designed specifically for electronic engines. Expanded functions of the SAE data buss include oil pressure and water temperature, eliminating redundant sensors on the engine. Cruise control and engine retarder wiring are optimized for electronic engines.



**WARNING!** *If the vehicle is equipped with an airbag system, the wiring for the airbag system should never be probed or spliced into. If damage is noted to any section of the harness, the entire section of harness must be replaced. Damage to the system harness could cause an airbag to deploy inadvertently, resulting in injury.*

### Wiring Circuits

Each circuit is color coded and identified with a circuit number. Wiring diagrams are included in this publication and in the Modular Wiring Diagram Book.

### Spare Circuits

Sixteen spare circuits are located on the Central Electrical Panel (CEP). There are

- 3 spare battery circuits
- 8 spare accessory circuits
- 5 spare ignition circuits

Each spare circuit is protected with its own fuse.

*NOTE: Easy addition of circuits is provided by plug-in connectors that have a ground and a power wire.*

### Fuses

Most fuses are bussed (use a common power source) whenever possible. The ATO fuse modules used as the power points for the 2-way connector are individually fused and the ground circuits are bussed (use a common ground source). Therefore, the current rating of the fuses limits the number of fuses on each buss bar.

The ATO fuse modules used as the power points for the 2-way connector are individually fused and the ground circuits are bussed.

The CEP E-block modules are individually serviceable. One module may be removed and replaced with another module.

Mini and maxi fuses use improved terminal technology to reduce heat build-up in the connector. Improved mounting dissipates heat away from, rather than into, adjacent components.



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### Relays

Maxi ISO relays capable of switching 60 amps eliminate overloading the key switch. A maxi ISO relay replaces the starter relay. To conserve space, mini relays are used in low current applications.

### Connectors

All connectors are a hard-shell type, sealed where necessary. Packard Metripack Vision 94 connectors are used most of the time, but under certain conditions, different type connectors (i.e. Deutsch) may be specified to meet application requirements.

The firewall connectors have a capacity of 68 circuits. They are serviceable and field additions can be made easily.

### Instruments

Refer to T2000 Instrument Panel, Form: KW4133 in the Master Shop Manual.

### A/D Module

The A/D module is located with the air tank cluster on the passenger side of the vehicle. This module translates the various temperature inputs on the vehicle into signals used by the instrument cluster. **The vent line attached to the module must be connected for proper operation and service.**

## General Troubleshooting

Replace components on the CEP in accordance with specifications provided by the manufacturer of that particular component.

E-block terminal service is described in the following pages.

### Component Locations

- Mega Fuse: on engine
- Starter Relay: in cab
- Fuse Panel: between AC duct



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### Portable Static-Dissipative Field Service Kit

This field service kit is designed to connect a technician and the static dissipative work surface to the same ground point. The wrist strap and the dissipative mat will drain any static charges from the body and from any conductive objects placed on the mat. The strap and mat will also prevent the generation of any new static charges.

Contact:  
3M Static and Electromagnetic Control Division  
P.O. Box 2963  
Austin, TX 78769-2963

1-800-328-1368 outside Texas  
1-800-252-8193 inside Texas

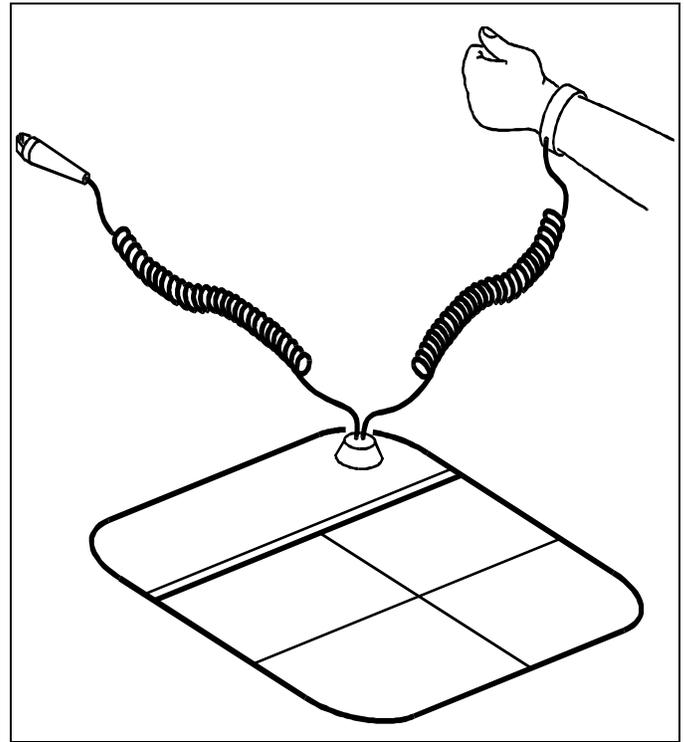
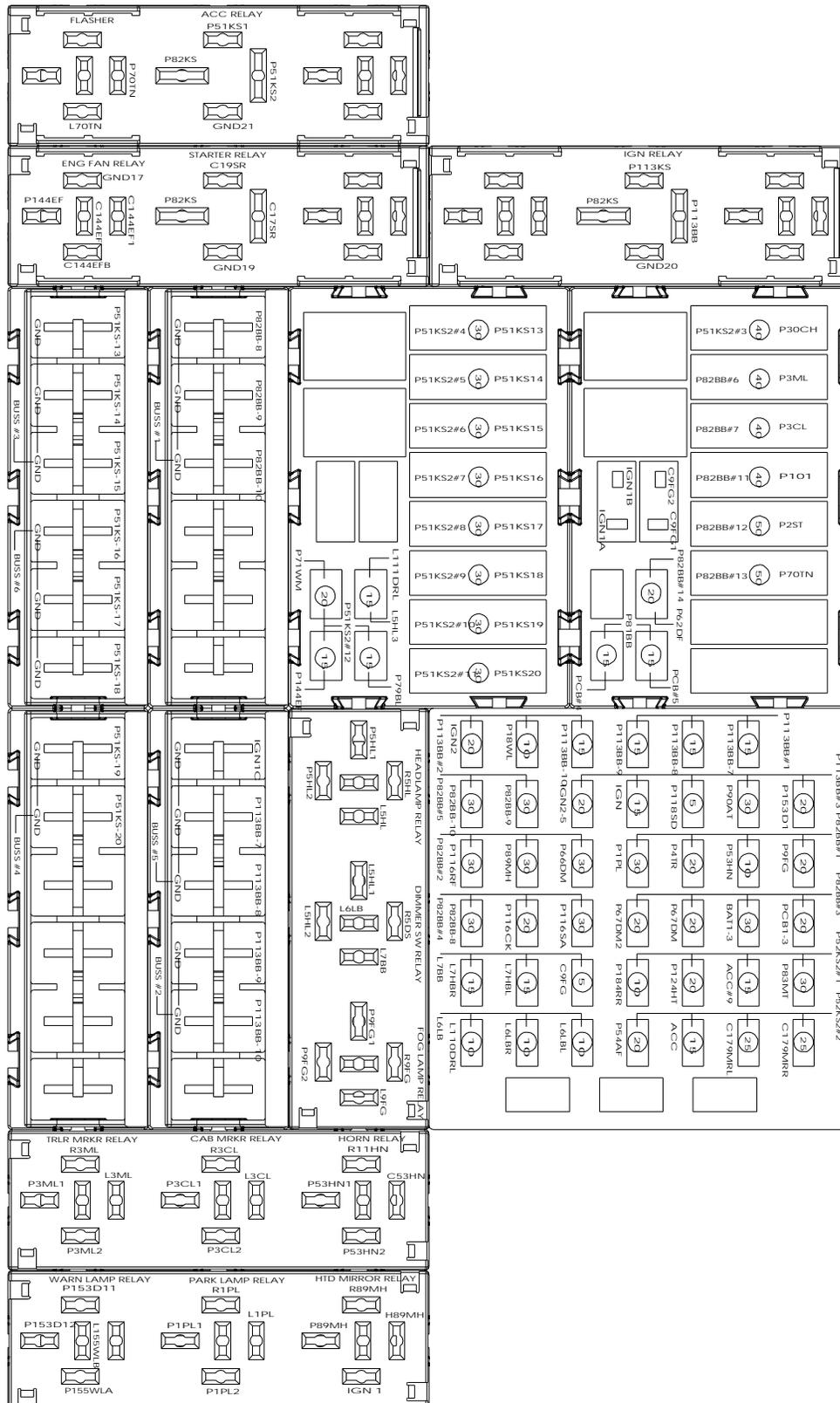


Figure 15-1



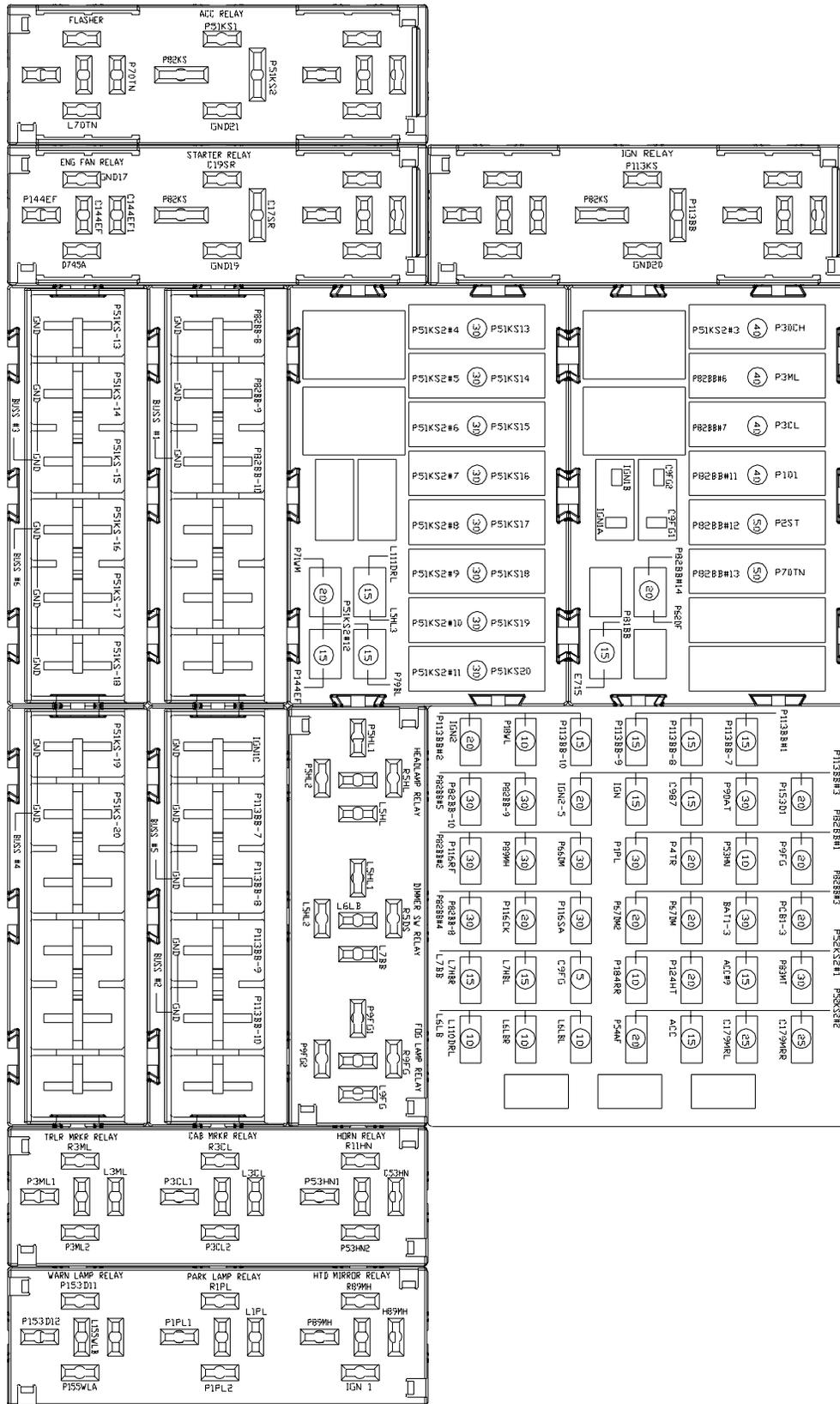
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Cummins E Block



**T2000 Electrical System**



**CAT E Block**



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### Red ISO Relay Spacer Removal

1. Work each end of the relay spacer up evenly using a 3mm flathead screwdriver.
2. The relay spacer should now easily pull away from the relay module.

### Red ISO Relay Spacer Installation

1. Align the relay spacer with the relay module.
2. Bend each of the four stop-lock legs toward the center of the module while applying a light downward force the spacer.

*NOTE: Some relay spacers will not have the stop-lock legs. Therefore, skip step 2 and go to step 3.*

3. Slowly work the spacer into position by applying a steady downward force to each end of the spacer.

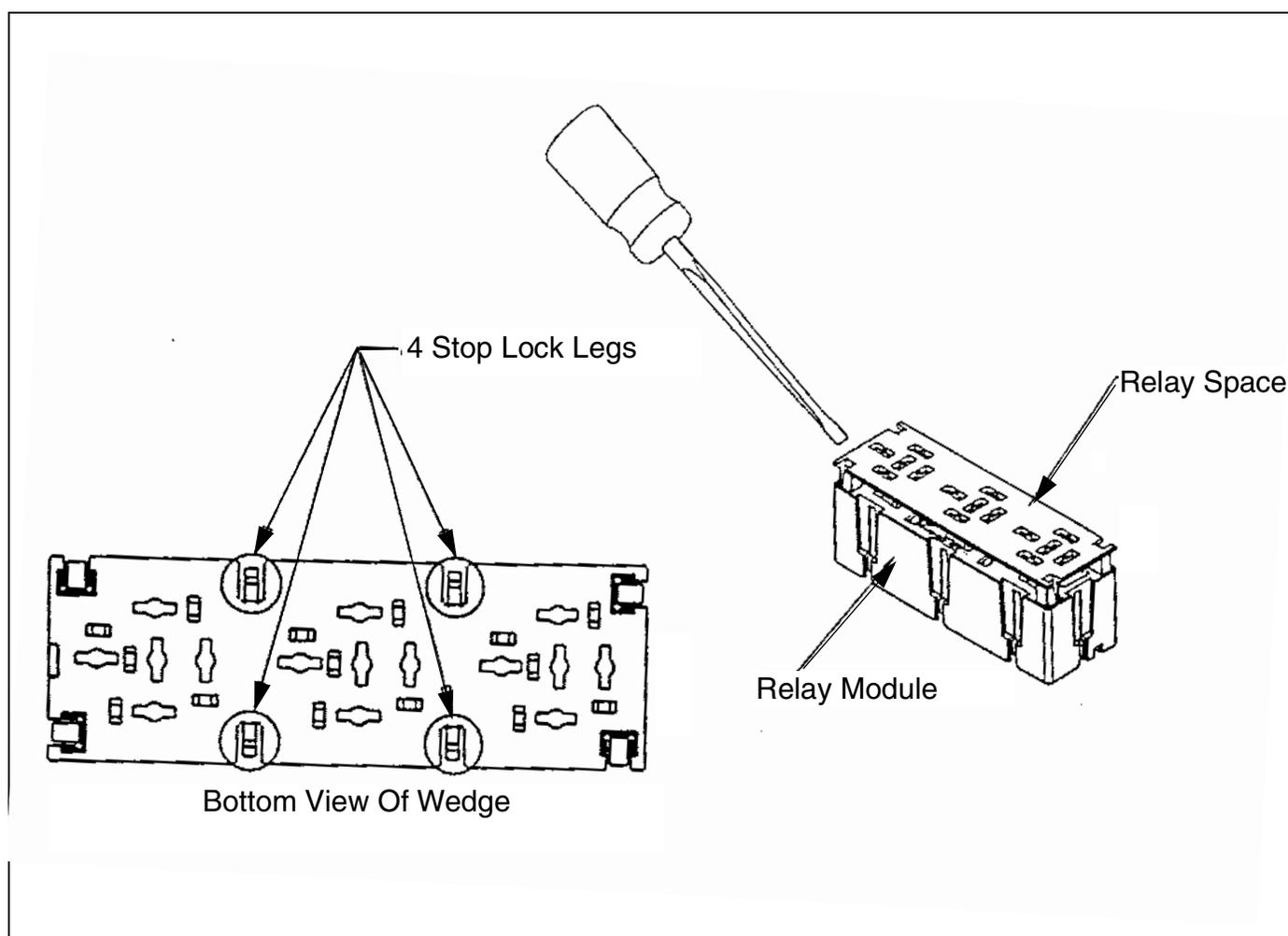


Figure 15-2



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### ISO Relay Terminal Removal

1. Remove red relay spacer. See previous page.
2. Insert a 3mm flathead screwdriver into the top of the cavity, positioned between the relay terminal and the terminal lock finger.
3. Bend the locking finger back away from the terminal, and simultaneously pull the wire which is attached to the terminal being removed.

4. The terminal should now easily be removed from the terminal cavity.

*NOTE: The procedures described for the ISO relay apply to the high current relay with the exception of the large terminals having 2 locking fingers. Both of these locking fingers need to be bent back while pulling on the wire.*

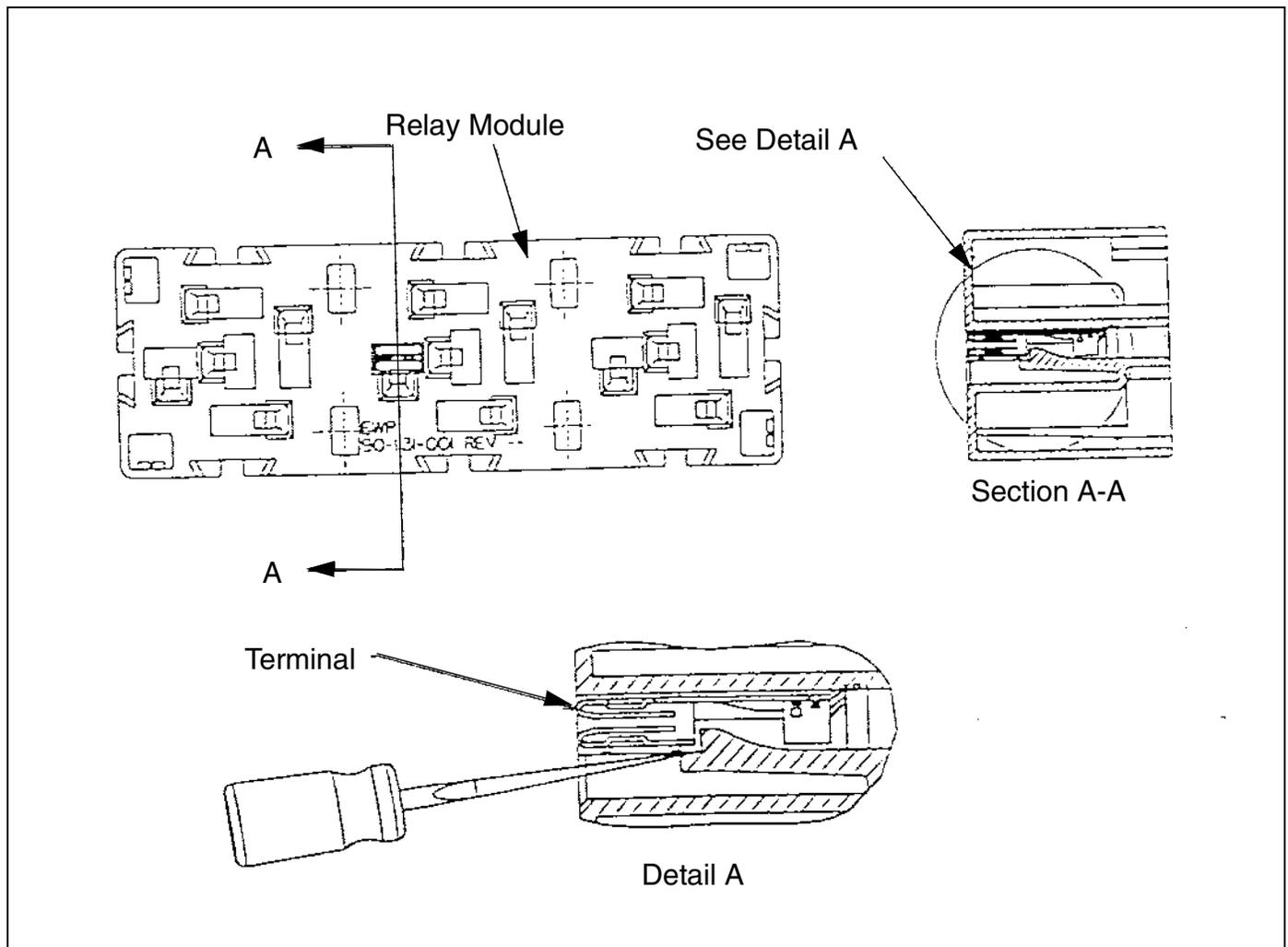


Figure 15-3



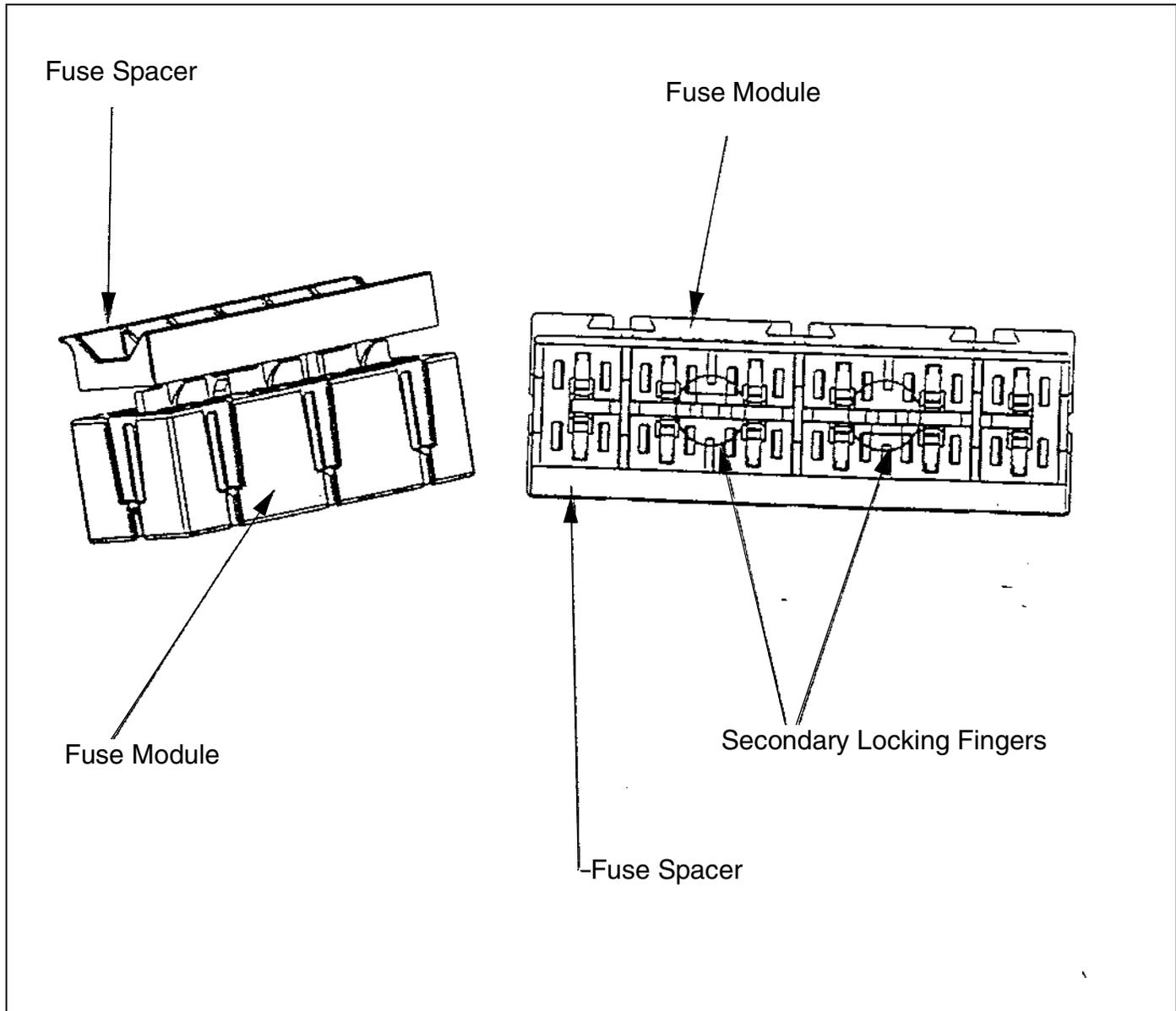
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**Modified ATO Fuse Terminal Removal**

1. Bend either of the two locking fingers back using a 3mm flathead screwdriver while applying an upward force on the end of the spacer (the same end as the

locking finger). The spacer will move slightly. Release the locking finger. The finger should remain unlocked.

2. Repeat step one on the other locking finger.
3. The spacer should now easily be removed from the module.



**Figure 15-4**

**ATO Fuse Terminal Removal**

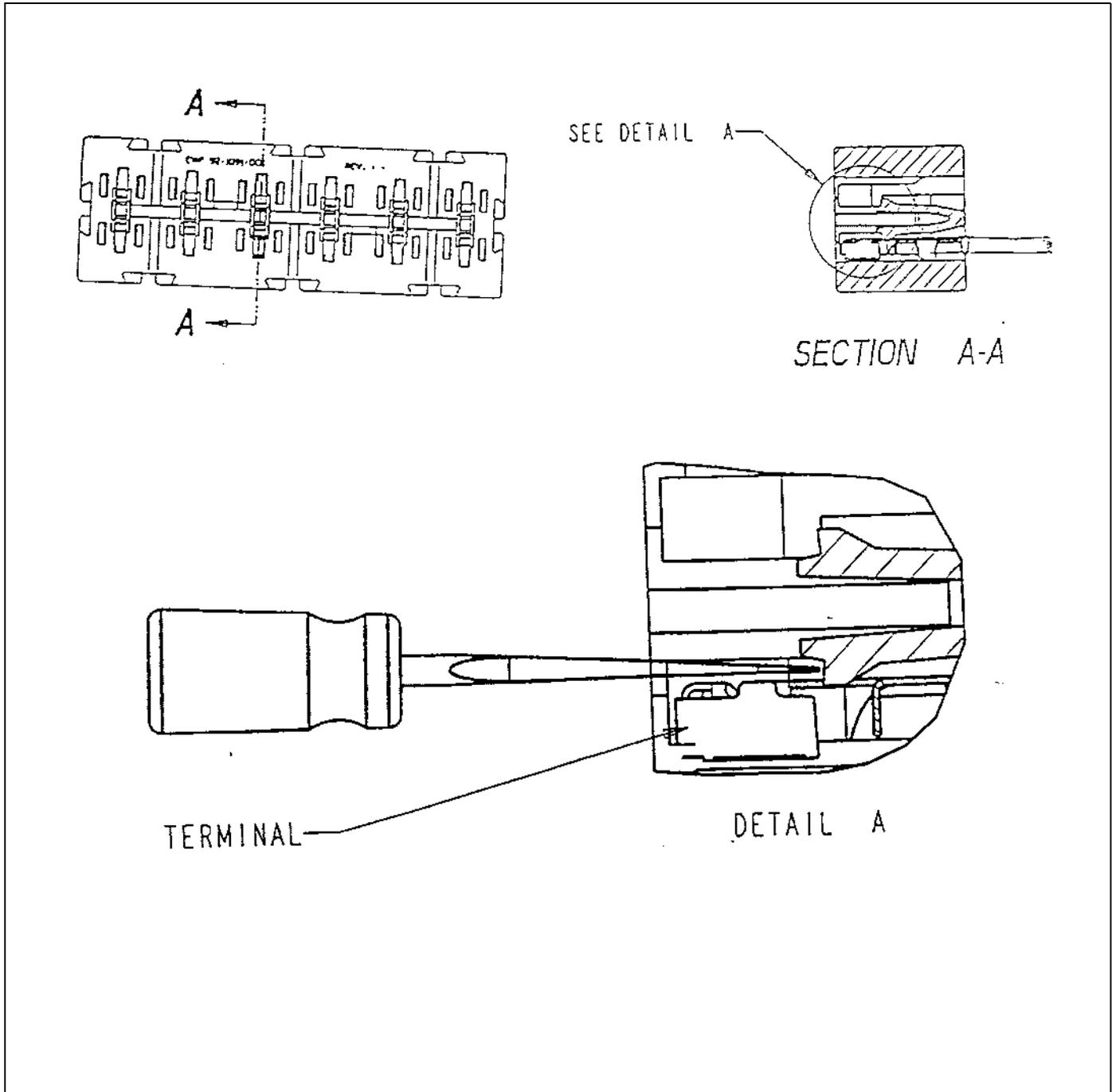
1. Remove modified ATO fuse spacer. See previous page.

2. Insert a 3mm flathead screwdriver into the top of the cavity, positioned between the terminal and the terminal locking finger.



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- 3. Bend the terminal locking finger back away from the terminal and simultaneously pull the wire which is attached to the terminal being removed
- 4. The terminal should now easily be removed from the module.



**Figure 15-5**

**Multi-Module Spacer Removal**

- 1. Work each end of the multi-module spacer up evenly using a 3mm flathead screwdriver.
- 2. The spacer should now easily pull away from the multi-module.



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### Multi-Module Spacer Installation

1. Align the spacer with the multi-module.
2. Slowly work the spacer into position by applying steady downward force to each end of the spacer.

### Multi-Module Terminal Removal

1. Remove the red multi-module spacer. See above.
2. Insert a 3mm flathead screwdriver into the top of the cavity, positioned between the terminal and the terminal locking finger.
3. Bend the locking finger back away from the terminal while simultaneously pulling on the wire which is attached to the terminal being serviced.

*NOTE: The terminal removal procedure is the same for every terminal in the multi-module.*

### 41 Cavity Mini-Fuse Removal

#### Red Mini-Fuse Spacer Removal

1. Work each end of the mini fuse spacer up evenly using a 3mm flathead screwdriver.
2. The spacer should now easily pull away from the mini fuse module.

### Mini-Fuse Spacer Installation

1. Remove the red mini fuse spacer. See above.
2. Insert a 3mm flathead screwdriver into the top of the cavity, positioned between the terminal and the terminal locking finger.
3. Bend the locking finger back away from the terminal while simultaneously pulling on the wire which is attached to the terminal being serviced.

### Buss Bar Removal

1. Remove the spacer of the module containing the buss bar system
2. Cut any tie straps which contain the buss bar system wires underneath the CEP.
3. Start at one end of the buss bar and insert a 3mm flathead screwdriver into the top of the cavity positioned between the terminal and the terminal locking finger.
4. Bend the locking finger away from the terminal while simultaneously pulling the wire which is attached to the buss bar being serviced.
5. Release the locking finger while continuing to pull on the wire.
6. Repeat steps 3, 4, and 5 for the adjacent locking fingers have been unlocked.
7. The buss bar should now pull out the module being serviced.