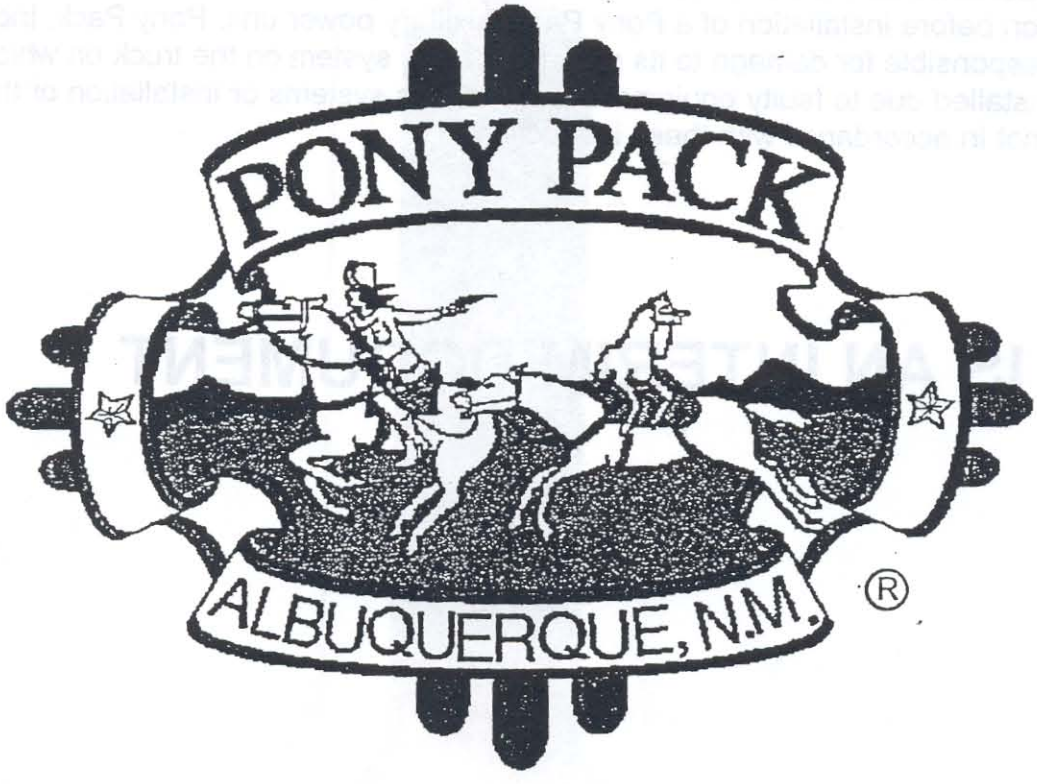
PONY PACK® MANUAL

OPERATOR / INSTALL



Serial Number:

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Pony Pack, Inc.
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Albuquerque, NM. 87102
505 243-1381

California Proposition 65 Warning

Diesel Engine Exhaust and some of its constituents are known to cause cancer, birth defects, and other reproductive harm.

DISCLAIMER

It is very important that the truck A/C, coolant, and fuel systems be free of leaks and contamination before installation of a Pony Pack auxiliary power unit. Pony Pack, Inc., cannot be responsible for damage to its products or any system on the truck on which it is being installed due to faulty equipment in the truck's systems or installation of the Pony Pack not in accordance with these instructions.

THIS IS AN INTERIM DOCUMENT

TABLE OF CONTENTS

PONY PACK MANUAL (OPERATOR / INSTALL)

PONY PACK PARTS LIST

A Pony Pack ®includes:

- Main unit, cover, and mounting frame
- Muffler, muffler clamp
- Cab wire harness and cab control panel
- Relay harnesses as needed
- Bosch 12 volt water pump
- In-line fuel filter
- A/C High pressure check valve
- A/C Suction Tee
- Various brass plumbing fittings
- Pony Pack ® Manual (Operation/Install)
- Kubota Engine Manual, and Kubota Dealer Directory

PONY PACK® PRE-INSTALLATION CHECK LIST

☐ Do all the truck's functions work properly?

☐ Do all the lights work properly?

☐ Does the Air Conditioning System work properly?

☐ Do all fan control and blower motors work properly?

☐ What is the ambient temperature?_____

☐ What are the vent temperatures? AC Heat

_____ _____

_____ _____

☐ AC Manifold Guage readings: Discharge (HI) _____

Suction (LOW) _____

☐ What is the cycle time on the truck's radiator fan?_____

☐ What is the voltage output of the truck's alternator?_____

PONY PACK MANUAL (OPERATOR / INSTALL)

GENERAL INSTRUCTIONS

WE ADVISE THAT YOU READ THE ENTIRE INSTALLATION MANUAL BEFORE BEGINNING, paying particular attention to the components you may need to purchase. We do not include hoses because hose lengths vary from truck to truck. The included cab wire harness is 25 feet long to accommodate the largest trucks. Each installation is unique and there are usually some components from the kit that won't get used as well as some components that will need to be purchased. Additional parts which may need to be purchased include:

- 3/4" coolant hoses and hose clamps
- Air conditioner hoses
- Fuel line, hose clamps and fittings to tap into the fuel tank
- Main power wire, 2 gauge or larger, solder, heat shrink tubing, and connectors
- Miscellaneous electrical end, butt, and bullet connectors
- Valves for the coolant plumbing if you choose to use them
- Brass plumbing fittings not included with the Pony Pack

We recommend that all hoses and wires be secured away from hot or moving parts and isolated from vibration.

MOUNTING THE PONY PACK

DO NOT modify the Pony Pack frame in any way without written permission from PPI.

Removing The Baseplate From The Frame

It is best to remove the Pony Pack from the frame before mounting the frame to the truck. DO NOT SET THE BASEPLATE ONTO A FLAT SURFACE. This may damage the heat exchanger outlet tube (muffler inlet). It is best to set the baseplate on a couple of 2 x 4's to keep the heat exchanger outlet tube off the floor.

Framerail Mount

The Pony Pack frame is usually mounted somewhere along the truck's framerails on the passenger side. We advise giving yourself an inch or two clearance on either side. We also recommend at least a couple of inches clearance above the aluminum Pony Pack cover for easy removal. The top of the Pony Pack mounting frame posts must sit flush with or slightly above the top of the truck's framerails.

If your truck is a Freightliner with side skirts, it may be necessary to modify a 24 inch section of the upper extruded aluminum bracket to which the fairing mounts. The lower aluminum bracket should remain the same.

The ideal siderail mounting location, behind the sleeper and out from under any overhanging equipment, provides the best access to the Pony Pack for installation, maintenance and repair, and simplifies cover removal.

The upright rectangular tubes on the steel mounting frame have aluminum inserts in them. The mounting holes must be drilled through these inserts. We recommend mounting the Pony Pack frame to the truck frame rails using four 1/2 inch diameter or greater, grade 8 bolts.

Deckplate Mount

BEFORE INSTALLING A PONY PACK ON A DECKPLATE, MAKE SURE THAT THE TRAILER SWING WILL CLEAR THE PONY PACK LOCATION.

IT IS CRUCIAL THAT THE TOP OF THE PONY PACK SIT BELOW THE WATER LEVEL IN THE RADIATOR TO PREVENT CAVITATION IN THE PONY PACK ENGINE'S WATER PUMP.

INTEGRATING THE TRUCK AND PONY PACK COOLANT SYSTEMS

The Pony Pack is plumbed into the truck's coolant system via two coolant hos installed between the Pony Pack and the engine block. Heating the cab or sleep involves cutting the inlet hose which transfers coolant from the truck's engine block the cab (or sleeper) heater core and installing the Bosch 12 volt in-line water pum (included).

The best locations for plumbing the Pony Pack to the truck are those which yield th most heat. The installer must understand that the Pony Pack cannot heat the entir truck's coolant system. The Pony Pack's purpose is to heat the engine block only Heating the coolant in the truck's radiator will result in less block and cab heating and is undesirable.

Plumbing The Pony Pack To The Engine

Coolant under pressure from an outlet at the front of the truck engine enters the Pony Pack through the copper line which travels through the Pony Pack's radiator, engine, and heat exchanger before exiting the rear of the Pony Pack through the green silicone hose and returning to a port at the rear of the main truck engine.

From The Truck Engine

Frequently, the heat exchanger temperature switch is installed in conjunction with the outlet hose from the truck engine.

Cab/Sleeper Heating System

A 12 volt in-line water pump is included in the Pony Pack installation kit. This pump needs to be installed in a hose which carries coolant from the engine to the heater core supply line. The heater return line should go into the suction side of the truck engine water pump, **BUT BE KEPT ABOVE THE BYPASS LINE TO THE TOP TANK OF THE RADIATOR. HOT WATER GOES UP !!!!!**

The 12 volt in-line water pump has a metal motor body with an attached black plastic pump housing. The pump inlet is the tube on the end of the housing. The pump outlet is the tube on the side of the housing. When installed, it is important that the motor body is oriented above the plastic pump housing to prevent coolant seepage from the pump housing from getting into the motor.

This pump is unusual in that **THE BROWN WIRE IS THE GROUND AND THE BLACK WIRE IS THE HOT WIRE.**

The cab heat pump will burn itself out if it does not have a water supply. It is also important that the driver does not operate the cab heat pump if his heater core supply shut-off valves are closed.

Heat Exchanger Temperature Switch

A 175° temperature switch (included) should be installed close to the outlet line on the truck engine and the white wire in the harness goes to it.

Placement of the temperature switch in the block affects its accuracy. Ideally, the temperature switch should be placed as close to the high pressure outlet from the truck engine as possible. In this configuration, the temperature switch monitors the coolant temperature just prior to exiting the block but after it has heated the engine.

The switch is wired directly to the Pony Pack via the white wire in the cab wire harness.

INTEGRATING THE TRUCK AND PONY PACK AIR CONDITIONING SYSTEMS

Two A/C hoses and two tees are used to integrate the Pony Pack with the truck's on-board A/C system. Figure 3, "Air Conditioner System Schematic" at the end of this manual illustrates how the two air conditioner systems tie together.

Installing The Check Valve Tee

The check valve tee is a #6 double check valve that needs to be installed on the high pressure side of the A/C system. Disconnect the condenser hose from the dryer inlet, and attach the check valve to the dryer via the tee fitting on the check valve. Reattach the hose from the condenser outlet to one of the check valve arms. The other arm of the check valve tee attaches to the hose from the Pony Pack condenser outlet which is the #6 A/C fitting exiting the rear of the Pony Pack.

Installing The Suction Tee

It is usually most convenient to install the suction tee in the suction line where it enters the truck sleeper. Since this is an open tee, it does not matter which connections on the tee are used. The hose from the line on the Pony Pack connects to the remaining side of the tee.

INTEGRATING THE TRUCK AND PONY PACK FUEL SYSTEMS

A 5/16" fuel line exits the rear of the Pony Pack. An in-line fuel filter, furnished with the unit, should be installed in this line according to the direction arrow on the filter. The Pony Pack is designed so that a separate return line does not need to run to the fuel tank. A 5/16" fuel line (supplied by the owner) is needed to connect the Pony Pack fuel line to the truck fuel supply. **DO NOT PLUMB TO THE VERY BOTTOM OF THE FUEL TANK BECAUSE THIS IS WHERE TRASH AND WATER ACCUMULATE.**

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CONTROL PANEL

The Pony Pack is controlled completely from the control panel mounted inside the truck's cab. The panel has four toggle switches, which are discussed below.

ON/IGN Switch

The IGN side of this switch is the ON position. This switch controls electrical power to the Pony Pack unit and all the truck controls pertaining to the Pony Pack. Related truck controls are the truck's fans and the truck's air conditioning controls. If within 15 seconds of turning the ON/IGN switch ON, the Pony Pack is not started, power to the AC clutch and fans will be cut-off. If the driver were to throw this switch back and forth, the fans would operate for 15 seconds at a time until the switch was thrown again. While we do not advocate toggling the ON/IGN switch back and forth unnecessarily, this example illustrates the 15 second automatic shut-down feature which makes it virtually impossible for a Pony Pack malfunction to drain the truck batteries.
The ON/IGN switch needs to be ON before the PREHEAT/START switch will work.

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PREHEAT/START Switch

The PREHEAT/START Switch is a spring loaded switch which preheats the glow plugs and starts the Pony Pack. With the ON/IGN switch in the ON position, hold the PREHEAT/START Switch to the left in the PREHEAT mode for 20 or 30 seconds. Then press the switch into the START position. Release the switch after the Pony Pack starts. If the Pony Pack does not start, preheat it again for 20 to 30 seconds and try to start the unit. The Pony Pack will start more readily if the MAIN/AUX switch is in the MAIN position or if air conditioning system is simply turned off.

ON/CAB HEAT Switch

This switch turns on the Bosch in-line water pump that is installed in the heater core feed hose. When this switch is ON, the pump circulates coolant through the heater cores in the cab, sleeper, or both. The pump will work for only 15 seconds unless the Pony Pack is running. If you use the cab heat pump, be sure that the dashboard controls are in the heater mode. Otherwise, the in-line water pump may burn out while trying to pump coolant against a shut-off heater core valve.

MAIN/AUX Switch

This switch controls which air conditioning compressor and power source for the blower motors, truck or Pony Pack, will operate when the dashboard air conditioner controls are turned on. In the MAIN position, the truck's AC system will operate as if there were no Pony Pack at all. In fact, the keyswitch must be in the ignition or switched accessory position. The AUX side operates the Pony Pack system. The key does not need to be in the keyswitch for the truck's blower motors and thermostat to work. (The word "OFF", under this switch is irrelevant. Older Pony Packs used a three position switch.)
Upon engaging, the Pony Pack compressor increases the load on the Kubota engine. It is normal to hear the tone of the engine change slightly. We recommend not using the Pony Pack air conditioner until the Pony Pack has been running for a few minutes and the Kubota engine is warm.

ON/ENGINE Light

When the Pony Pack is running, this light is on.

The Cab Wire Harness

First, choose a location in the cab for the Pony Pack control panel. Usually it is mounted in the dashboard, frequently replacing the ashtray. PONY PACK,INC. DISCOURAGES MOUNTING THE CONTROL PANEL IN THE BUNK. WE WILL NOT BE RESPONSIBLE FOR ELECTRICAL PROBLEMS RESULTING FROM A BUNK MOUNTED CONTROL PANEL. Plug the end of the harness with the two waterproof plugs into the Pony Pack. Run the cab wire harness from the Pony Pack to the back side of the

Control Panel

The Pony Pack is controlled completely from the control panel mounted inside the truck's cab. The panel has four toggle switches. See drawings at end of manual.

The Cab Wire Harness

First, choose a location in the cab for the Pony Pack control panel. Usually it is mounted in the dashboard, frequently replacing the ashtray. **PONY PACK,INC. DISCOURAGES MOUNTING THE CONTROL PANEL IN THE BUNK. WE WILL NOT BE RESPONSIBLE FOR ELECTRICAL PROBLEMS RESULTING FROM A BUNK MOUNTED CONTROL PANEL.** Plug the end of the harness with the two waterproof plugs into the Pony Pack. Run the cab wire harness from the Pony Pack to the back side of the control panel. Select a suitable location to drill a hole in the firewall, preferably near the control panel location. Before threading the harness through the firewall, separate the loom and locate the white 16 gauge wire. (This is the only white wire.) This wire attaches to the heat exchanger temperature switch. Also separate the green wire. This wire attaches to the black wire on the cab heat pump. Thread the remaining wires and loom through the hole in the firewall and route them to the control panel.

Connecting The Ground Strap

Because it is mounted on 4 rubber feet, the Pony Pack is electrically isolated. A ground strap is bolted to the underside of the baseplate near the front. The other end of the ground strap needs to be bolted to a solid ground. Commonly, one of the front mounting feet bolts are used.

Wiring The Main Power Lead

INSTALL THE MAIN POWER LEAD ONLY AFTER ALL OTHER ELECTRICAL CONNECTIONS ARE MADE. The main power lead from the Pony Pack to the truck engine should be a 2 gauge cable. Pony Pack, Inc. highly recommends using crimped, soldered, and heat shrink end connectors and a full length wire loom. One end of the cable connects to the power cable that exits the rear of the PONY PACK. The other end of the main power lead connects to the output post on the truck's alternator.

INSTALLING THE PONY PACK MUFFLER

The muffler bolts to the underside of the baseplate on the same side as the heat exchanger using two 3/8" x 1-1/2" bolts and lock nuts (included). Use the muffler clamp (included) to clamp the muffler inlet tube over the heat exchanger outlet tube which protrudes just below the baseplate.

POST INSTALLATION INSPECTION

A wire harness, main power wire, two water lines, one fuel line, and two A/C lines all exit the rear of the Pony Pack connecting it to the various systems on the truck. Be sure these lines are secured away from hot or moving parts. Similarly, pad hoses where they may rub. Check all these lines periodically. Thermally insulating the water hoses will improve the Pony Pack's efficiency.

On trucks with air actuated doors and valves on their heating/AC system, the A/C compressor will not work properly without air pressure in the system. After the Pony Pack is installed, idle the truck for 5 or 10 minutes before putting the refrigerant back into the system.

INITIAL START-UP PREPARATION

Bleed the air out of both the fuel system and the coolant system before starting the Pony Pack for the first time. Make sure the engine has oil in it. Once the ignition switch on the Pony Pack control panel is turned on, the Pony Pack functions will work for 15 seconds before automatically shutting down. (This auto shut-down feature prevents the Pony Pack from discharging the batteries if the Pony Pack shuts down).

Bleeding The Air Out Of The Fuel System

There are 3 bleeder screws on the Kubota engine. (They all take a 10 mm wrench.) Figure 1 shows 3 screws numbered 1 through 3. They need to be bled in that order. It is a good idea to lay a rag over the alternator to keep dripping fuel out. **REMOVE THE RAG BEFORE STARTING THE PONY PACK**. Press the service button on to activate the Pony Pack's fuel transfer pump for 15 seconds at a time. Open the first bleeder screw 1 or 2 turns. When fuel starts coming out from under the screw threads, close the screw. Do the same with the 2nd and 3rd bleeder screws. **DO NOT OVERTIGHTEN SCREWS 1 AND 2**. The service button may need to be pressed several times.

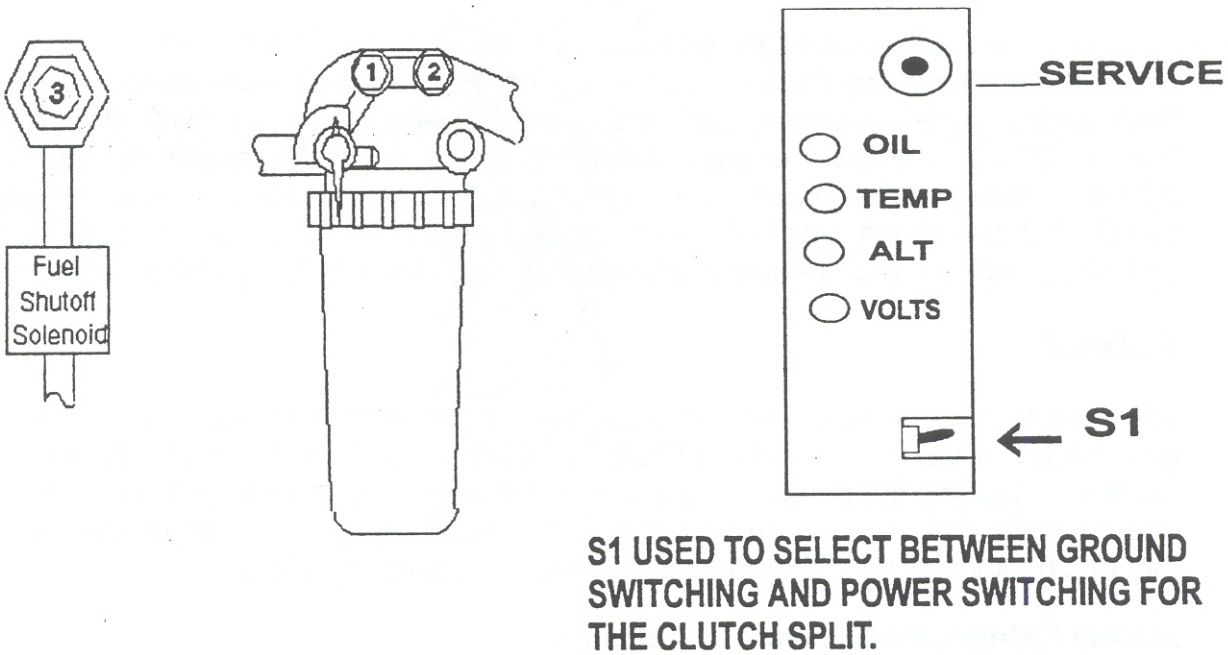

Figure 1: Location of the three bleeder screws.

Bleeding The Air Out of the Coolant System

To bleed the air out of the coolant system, clamp the hose between the radiator and the water pump. Also clamp the hose between the thermostat housing and the heat exchanger. Remove the hose from the thermostat housing. Loosen the clamp on the hose between the radiator and the water pump. When all the air is expelled from the thermostat housing neck, re-clamp this hose. Loosen the clamp on the hose between the thermostat housing and the heat exchanger. When water is received, replace the hose on the thermostat housing.

Checking The Heat Exchanger Flapper Mechanism

The flapper valve on the heat exchanger is controlled by the small electric motor. The motor is positioned at the front of the Pony Pack and to the right of the thermostat housing. This motor is controlled by the temperature switch installed in the truck engine. To test this motor, undo the white wire on the temperature switch. Touch this wire to a SOLID ground. The heat exchanger motor should throw the heat exchanger flapper valve linkage toward the condenser (heat exchanger mode). Remove the ground and the flapper valve should move away from the condenser (bypass mode). If the ground is not solid, the flapper valve may stutter.

Checking The A/C Compressor Clutch Control

With key in and the truck's ignition switch turned on, turn on the truck's air conditioning controls. Turn the Pony Pack ignition switch on. Flip the lower right switch on the Pony Pack control panel (switch 4) back and forth between MAIN and AUX. On MAIN, the truck's A/C clutch should engage. On AUX, the Pony Pack's clutch should engage. **NOTE:** There must be pressure (refrigerant) in the system for the clutch to engage. Check that the clutch selector switch located on bottom of control module is set to correct position for your vehicle. Both clutches must never engage at the same time.

MODULE

The module is mounted under the cover of the Pony Pack on the left hand side. It has four small red LED's on it labeled "OIL", "TEMP", "ALT" and "VOLTS". It monitors oil pressure, coolant temperature, and alternator output. If the Pony Pack shuts down unexpectedly, before trying to restart the unit, the driver should remove the cover and see which indicator light is on and troubleshoot the unit accordingly.

Adding Refrigerant Back Into The System

The Pony Pack is the practical place to charge the A/C system. It should take between 1/2 and 1 pounds of refrigerant in addition to the truck's refrigerant capacity.

PRE-START INSPECTION

1. With the engine off, remove the cover.
2. Check the oil level and add oil if necessary.
3. Visually check for evidence of coolant or oil leakage.
4. Tighten or replace the main drive belt if it is loose or worn.
5. Replace the water pump belt if it is worn.
6. Visually check mounting bracket bolts.
7. Check for loose, broken, or corroded wiring and connectors.
8. Check the condition of hoses and make sure the hose clamps are tight.
9. Replace the cover and check the mounting frame and baseplate feet for rigidity.

MAINTENANCE

Changing The Oil

Change the oil and the filter every 125-150 hours. The oil capacity of the Kubota Z482 engine is 2.3 quarts. Because Pony Pack runs every engine before it leaves our factory, your new unit should already have Rotella T 15-40 oil in it. Do not mix different oils. Most customers simply use the same oil that is in their truck engine after their first oil change..

Periodic Checks (Kubota)

Kubota recommends checking certain items at regular intervals. These intervals are outlined in the Kubota engine manual.

Air Cleaner

Under normal conditions, the air cleaner should last several hundred hours. Lack of power, excessive fuel consumption, and black smoke indicate a dirty air cleaner.

Cleaning Out The Heat Exchanger

The Heat Exchanger should be cleaned out every 3 months. Unsnap the Heat Exchanger blanket at the top casting and expose the hatch cover. Remove the hatch cover. With a small rod or stiff wire, make sure all 21 copper tubes are open. Seal off the end of the muffler with a small plastic bag or gray tape. Pour household ammonia into the 21 copper tubes. It should hold just under 1 gallon to completely fill the Heat Exchanger and muffler. The ammonia will dissolve the carbon after a few minutes. Unplug the muffler and pour water through the heat exchanger until it runs clear. Re-assemble the Heat Exchanger. **NOTE: Do Not** overfill or the ammonia will run into the engine's cylinders.

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ELECTRICAL TROUBLESHOOTING GUIDE

The electrical troubleshooting guide is divided into 10 sections; one for each of the 10 symptoms listed below. Follow the instructions in the section which best describes the problem you are having. Pony Pack control panel switches are capitalized. Diagrams of the four common control panel wiring schemes as well as Pony Pack wiring schematics are included at the end of this section.

1. Starter will not engage.
   A. Check that the ON/IGN switch is on.
      Yes - Go to B
      No - Turn on the ON/IGN switch.
   B. Engage the START switch and check for +12V on the main starter post.
      Yes - Go to C
      No - Check main battery wire and connections.
   C. Engage the START switch and check for +12V on the orange solenoid wire at the starter solenoid.
      Yes - Replace the starter
      No - Go to D
   D. Engage the START switch and check for +12V on the orange wire at the START switch on the control panel.
      Yes - Check for broken wire in the cab harness or unit harness.
      No - Go to E
   E. Check for +12V on the red/white wire on the PREHEAT/START switch.
      Yes - Replace the PREHEAT/START switch.
      No - Go to F
   F. Check for +12V on the red wire on the ON/IGN switch.
      Yes - Replace the ignition switch.

2. **Engine will not start.**
   A. Turn on the ON/IGN switch. Check for +12V on the red/white wire on the PREHEAT/START switch.
      Yes - Go to B
      No - Go to section 1-F.
   B. Turn the START switch ON then OFF and check for +12V on the blue wire on the MAIN/AUX switch or ON/CAB HEAT switch. NOTE: This check must be made within 15 seconds.
      Yes - Go to G
      No - Go to C
   C. Turn START switch ON and check for +12 V on the ORANGE wire from the start/preheat switch to the back of the Pony Pack
      Yes - Check for a broken wire in unit harness or cab harness.
      No - Go to D
   D. Check for +12 V on the 18 gauge red/white wire on the control panel.
      Yes - Go to E
      No - Go to Section 1-G
   E. Check for +12V on the 18 gauge red/white wire control module.
      Yes - Go to F
      No - Check for broken wire in unit harness or cab harness.
   F. Turn the ON/IGN switch off then on. Check for less than 1 V on the 18 gauge blue wire on the fuel solenoid. NOTE: This check must be made within 15 seconds.
      Yes - Replace the module
      No - Go to G.
   G. Turn ON/IGN switch off then on. Check that the fuel pump runs. NOTE: This check must be made within 15 seconds.
      Yes - Go to H

No - Replace the fuel pump.

H. Turn ON/IGN switch off then on. Check that the fuel solenoid engages. NOTE: This check must be made within 15 seconds.
   Yes - Engine problem is not electrical.
   No - Replace the fuel solenoid.

3. **Engine is hard to start.**

A. Check that the MAIN/AUX switch is on MAIN (this keeps the Pony Pack compressor clutch from engaging).
   Yes - Go to B
   No - Set the MAIN/AUX switch to MAIN

B. Turn on the ON/IGN switch. Check for +12V on the 18 gauge red wire on the ON/IGN switch.
   Yes - Go to C
   No - Go to Section 1-F

C. Engage the PREHEAT switch. Check for +12V on the yellow\black wire on the PREHEAT switch.
   Yes - Go to D
   No - Replace the PREHEAT/START switch.

D. Engage the PREHEAT switch. Check for +12V on the yellow\red wire on the glow plugs.
   Yes - Check the glow plugs.
   No - Go to E

E. Check for proper connection of 6 pin plug to module.
   Yes - Go to F
   No - Check for a broken wire in the unit harness.

F. Replace module.

4. **Engine will not shut off with switch.**

A. Turn the ON/IGN switch off. Check for +12V on the 18gauge red/white wire on the ON/IGN switch.
   Yes - Replace the ON/IGN switch.
   No - Go to B

B. Check for +12V on the blue wire on the MAIN/AUX switch.
   Yes - Replace the control module.
   No - Replace the fuel solenoid.

5. **Engine shuts down in approximately 15 seconds.**

A. Check the module for one or more LED's glowing.
   Yes - Go to C
   No - Go to B

B. Start the engine and monitor the blue wire on the cab heat switch. At shut down, check for +12V on the blue wire.
   Yes - Replace the module.
   No - Problem is not electrical.

C. The module is indicating an engine problem due to overheating, loss of oil pressure or loss of alternator output. Make sure the indicated system is not failing before continuing.
   Check which LED is glowing.
   Oil - Go to D
   Temp - Go to E
   Alt - Go to F

D. Locate the oil sensor on the lower right front of the engine. Disconnect the green wire from the sensor. Start the engine. Check for a ground on the green wire.
   Yes - Check the unit harness for a short.
   No - Replace the oil sensor.

E. Locate the shut-down temperature sensor located on the upper left rear of the engine. Disconnect the plug from the sensor. Start the engine. Check for a ground on the green/white wire.
   Yes - Check for a short in the unit harness.
   No - Replace the shut-down temperature sensor.

F. Locate the alternator on the left side of the engine. Disconnect the blue wire from the alternator. Start the engine. Check for a ground on the blue wire.
   Yes - Check for a short in the unit harness.
   No - Replace the alternator.

NOTE: If a false shut-down occurs with the sensor wire disconnected and no ground is found on the sensor wire, replace the control module.

6. Engine runs but will not heat the cab, engine, or both.

A. Start the Pony Pack and let it run long enough to heat up. (30 to 45 minutes in the summertime, longer in the winter.) Turn on the truck ignition switch and check the engine temperature gauge. Does the main engine heat up?
   Yes - Go to H
   No - Go to B

B. Check for a ground on the 16 gauge white wire on the module connector.
   Yes - Go to D
   No - Go to C

C. Locate the main engine block temperature switch. Check for a ground on the white wire on the temperature switch.
   Yes - Check the unit and cab harnesses for a broken wire.
   No - Replace the block temperature switch.

D. Locate the main engine block temperature switch. Observe the heat exchanger motor while disconnecting the white wire from the main engine block temperature switch. Does the heat exchanger motor cycle to the bypass position (swings away from the condenser)?
   Yes - The problem is not electrical.
   No - Go to E

E. Reconnect the white wire to the main engine block temperature switch. Does the heat exchanger motor cycle to the heat exchanger position (swings toward the condenser)?
   Yes - Check the block temperature switch, cab harness, and unit harness for a loose connection.
   No - Go to F

F. Disconnect the 2- pin connector on the heat exchanger motor from the unit harness. Jumper +12V to the one wire and ground to the other wire on the motor. Does the heat exchanger motor cycle?
   Yes - Check the unit harness for broken wires. If there are none, replace the module.
   No - Go to G

G. Reverse the +12V and ground connections to the heat exchanger motor. Does the motor cycle?
   Yes - Check the unit harness for broken wires. If there are none, replace the module.
   No - Replace the heat exchanger motor.

H. Be sure the CAB HEAT switch is on. Check for +12V on the blue wire on the cab heat switch.
   Yes - Go to I
   No - Check for a broken wire in the cab harness.

I. Check for +12V on both terminals of the cab heat switch.
   Yes - Go to J
   No - Replace the cab heat switch.

J. Locate the cab heater pump installed in the heater hose lines from the main engine. Check for ground on the BROWN wire from the pump. (The brown is the ground and the black is the power wire.)

Yes - Go to K
No - Check for a broken ground wire.

K. Check for +12V on the black wire from the cab heater pump.
Yes - Replace the cab heater pump.
No - Check for a broken wire from the CAB HEAT switch.

7. Engine runs but compressor clutch will not engage.

A. Turn the MAIN/AUX switch to MAIN. Does the main engine compressor clutch engage?
Yes - Go to C
No - Go to B

note: check the position of S1 on the module is it in the correct position for your truck.

B. Check for +12V (ground on some trucks) on the main clutch wire. (It may be helpful to refer to the control panel wiring diagrams later in this manual).
Yes - Check the MAIN/AUX switch.
No - Check the thermostatic control. Repair the truck AC system.

C. Turn the MAIN/AUX switch to AUX. Check for +12V / GROUND on the gray wire on the switch.
Yes - Go to D
No - Replace the MAIN/AUX switch.

D. Locate the pressure switches on the right front of the engine. Check for+12V on the gray/white wire on the harness connecting to the high pressure cut-off switch.
Yes - Go to E
No - Check for a broken wire in the unit harness or cab harness.

E. Check for +12V on the wire connecting the high pressure cut-off switch to the low pressure cut-off switch.
Yes - Go to F
No - Check the system charge. Replace the defective pressure switch.

F. Check for +12V on the gray wire on the module .
Yes - Go to G
No - Check for a broken wire in the unit harness.

G. Check for +12V on the black wire on the PP compressor clutch.
Yes - Replace the compressor clutch.
No - Check for a broken wire in the unit harness.

8. Compressor clutch will not disengage.

A. Turn the MAIN/AUX switch to MAIN. Check for +12V on the black wire on the MAIN/AUX switch.
Yes - Go to B
No - Go to C

B. Disconnect the black wire from the MAIN/AUX switch. Check for +12V on the black wire.
Yes - Check for a short in the unit harness or cab harness.
No - Replace the MAIN/AUX switch.

C. Check for +12V on the gray wire at the module.
Yes - Replace the module.
No - Replace the compressor clutch.

9. Fan will not run.

A. Start the PP engine. Disconnect the 2-pin plug from the rear of the fan Jumper +12V to one terminal and ground to the other terminal. Does the fan run?
Yes - Go to B
No - Replace the fan.

B. Remove the jumpers. Reconnect the 2-pin plug on the fan to the unit harness. Locate the fan pressure switch on the right front of the engine. Disconnect the 2-pin plug from the harness to the pressure switch. Jumper across the terminals on the unit harness. Does the fan run?
Yes - Go to H
No - Go to C

C. Temporarily leave the jumper on the unit harness from the fan pressure switch. Check the 18 gauge brown/white wire on the module for ground.
   Yes - Go to D
   No - Check the unit harness for a broken wire.
D. Check the brown wire on the fan plug for +12V.
   Yes - Go to E
   No - Check the unit harness for a broken wire to the fan.
E. Check the black wire on the fan plug for ground.
   Yes - Check the fan connection.
   No - Check for broken wire

10. Condenser fan runs continuously.

A. Turn the MAIN/AUX switch to MAIN. Locate the temperature sensor at the top rear of the engine. Disconnect the plug from the sensor. Does the fan still run?
   Yes - Go to B
   No - If engine temp is hot enough to stay on it's okay. If not replace temp sensor
B. Locate the fan pressure switch on the right front of the engine. Disconnect the 2-pin plug from the unit harness. Does the fan still run?
   Yes - Go to C
   No - Replace the fan pressure switch.
C. If engine temp is hot enough to stay on it's okay. If not Replace the module.

11. Blows Main Power Fuses (F1,2).

A. Turn all the Pony Pack switches off and the MAIN/AUX switch to MAIN. Remove the Main Power Fuses (F1,2). Check for a ground on one side of Main Power Fuses.
   Yes - Go to B
   No - Go to C

B. Replace module.

C. Check harness for short.

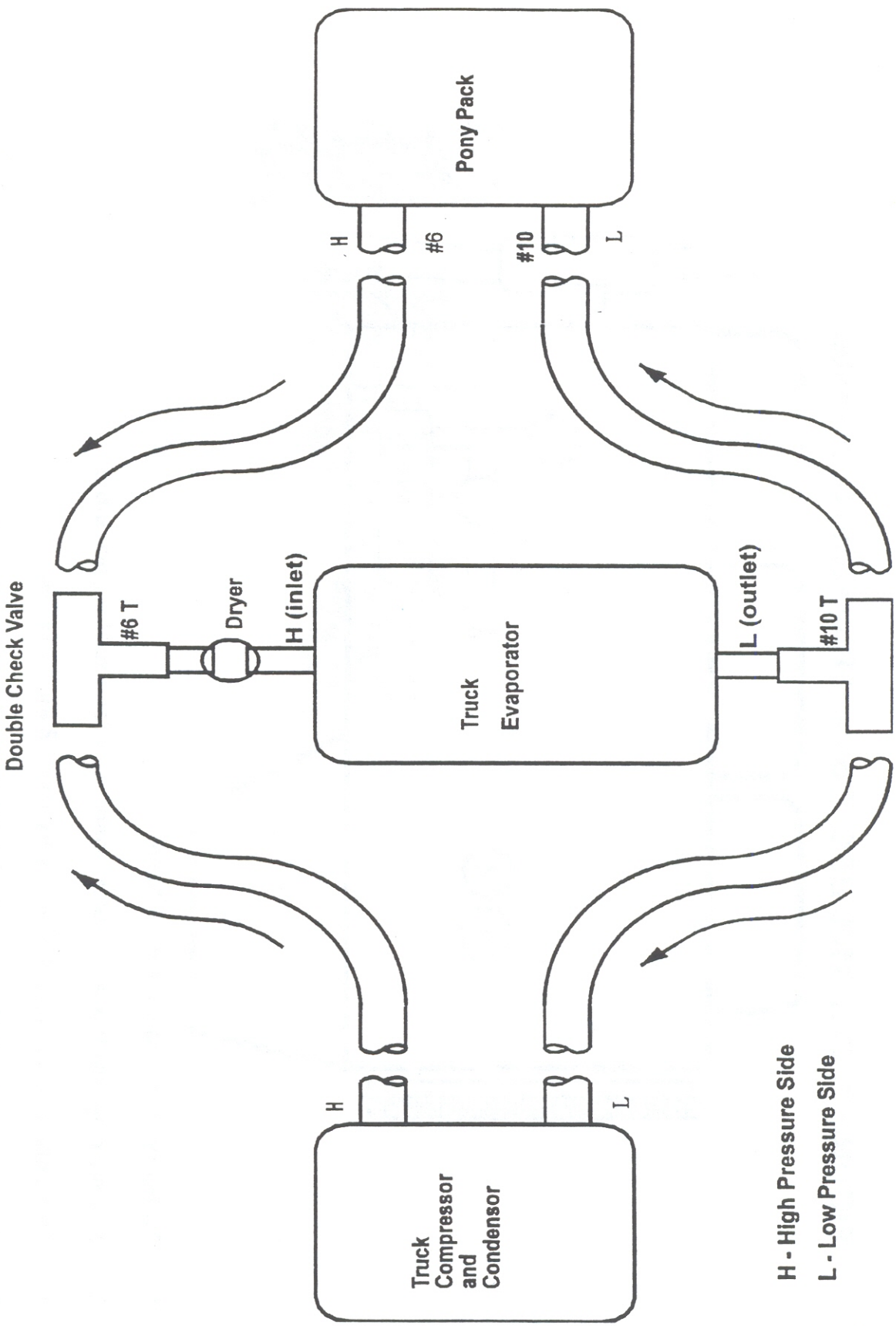
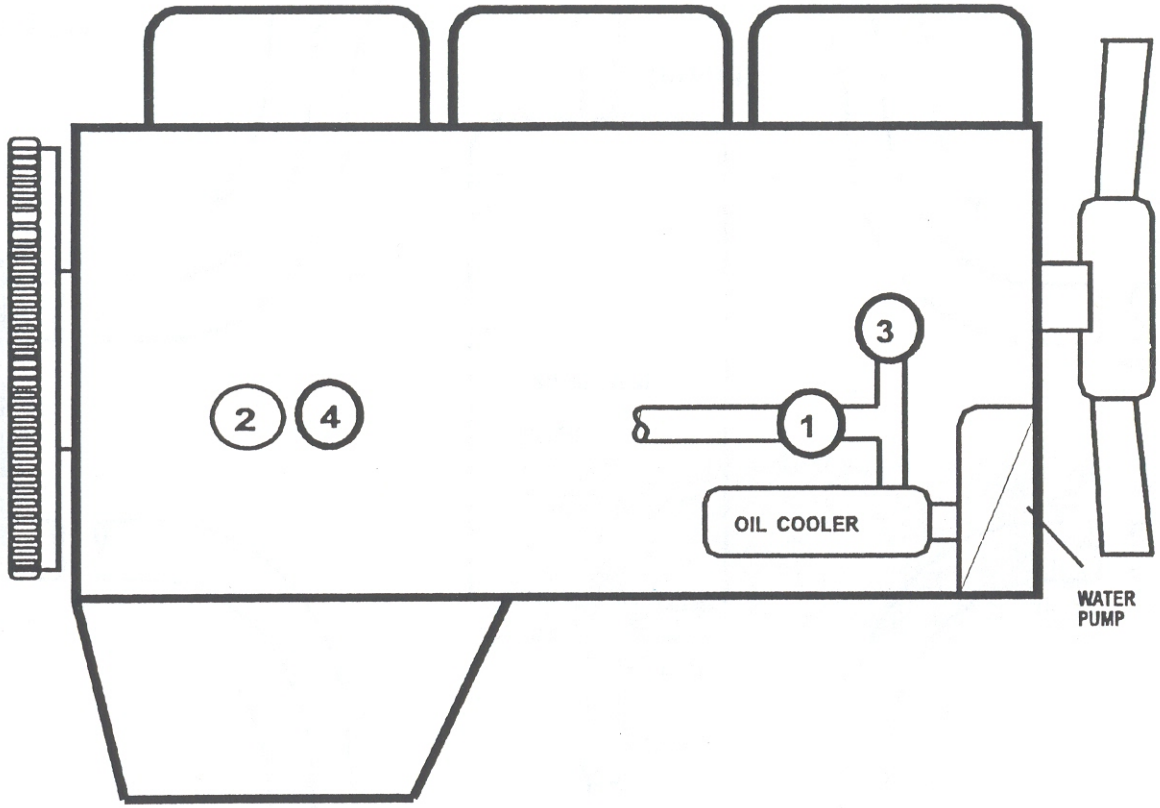


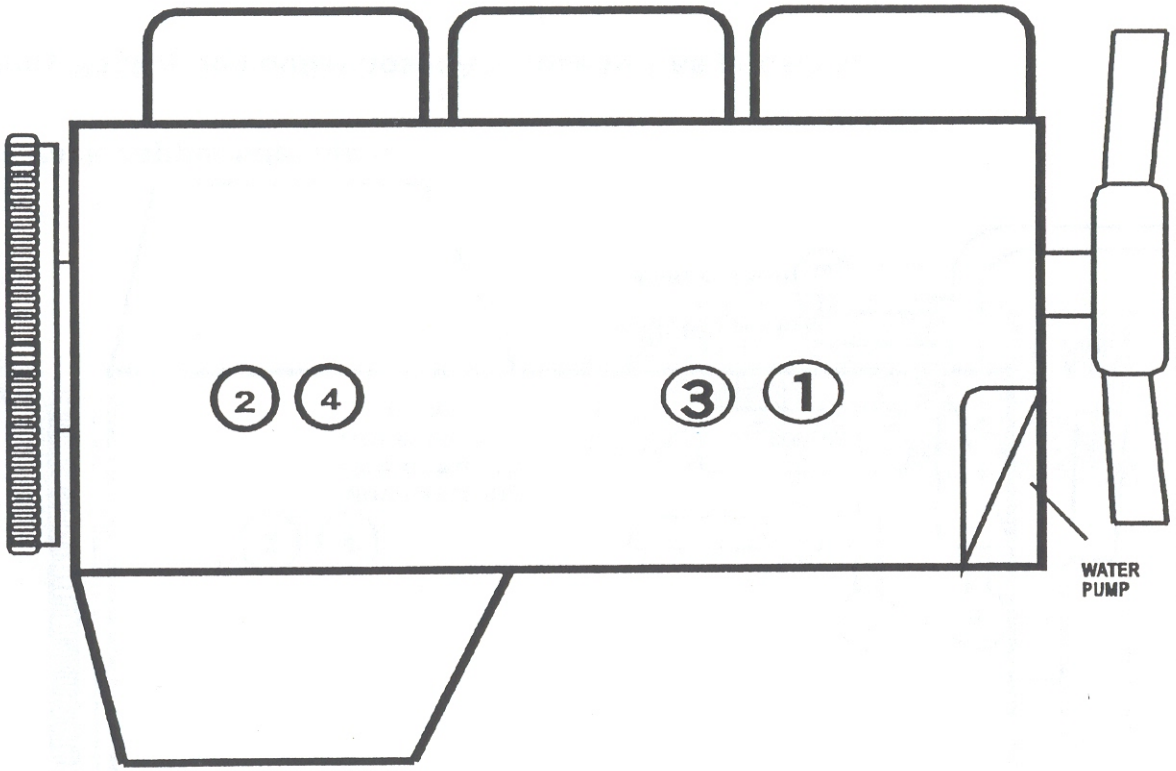
FIGURE 2: Air Conditioner System Schematic

FIGURE 3: CAT 3406 B&C Coolant Plumbing Schematic



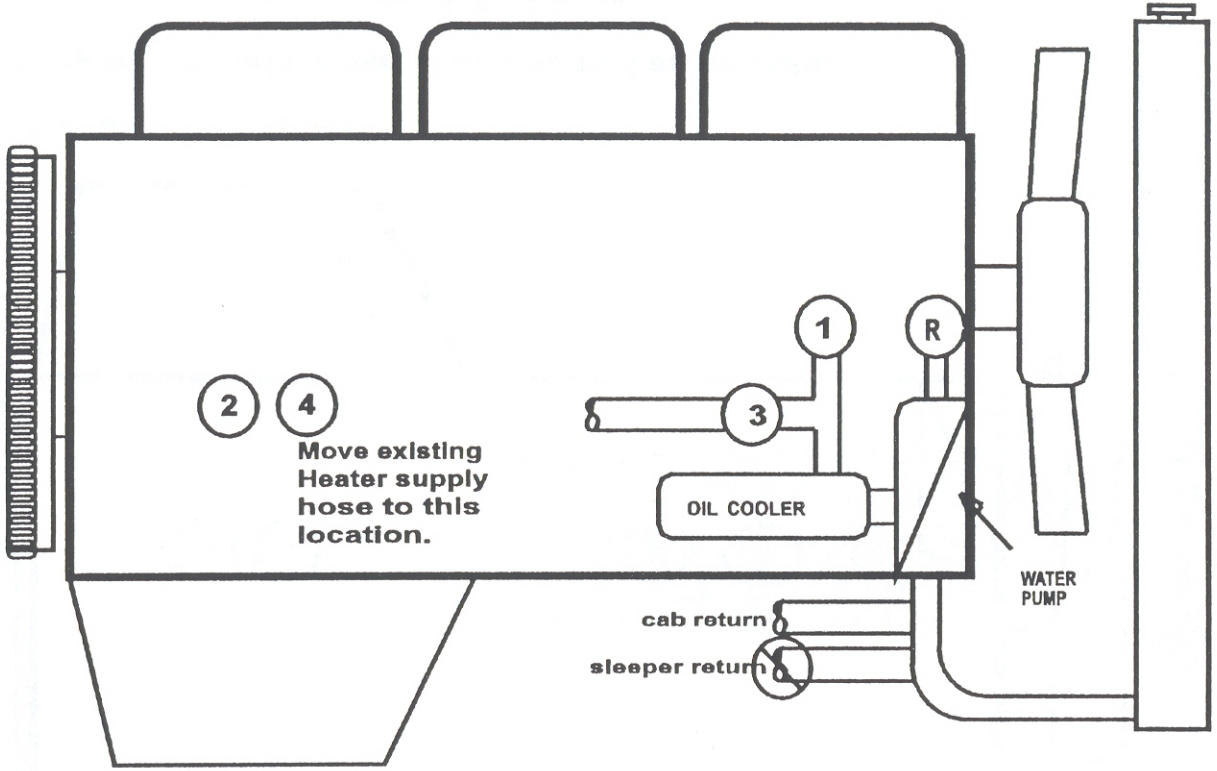
1. To Pony Pack copper inlet tube.
2. From Pony Pack green oulet hose: As close to 4 as possible.
3. Temperature Switch: As far away from 2 as possible.
4. Bosch in-line coolant pump: Installed in the existing heater supply hose with 2.

FIGURE 4: CAT E model Coolant Plumbing Schematic



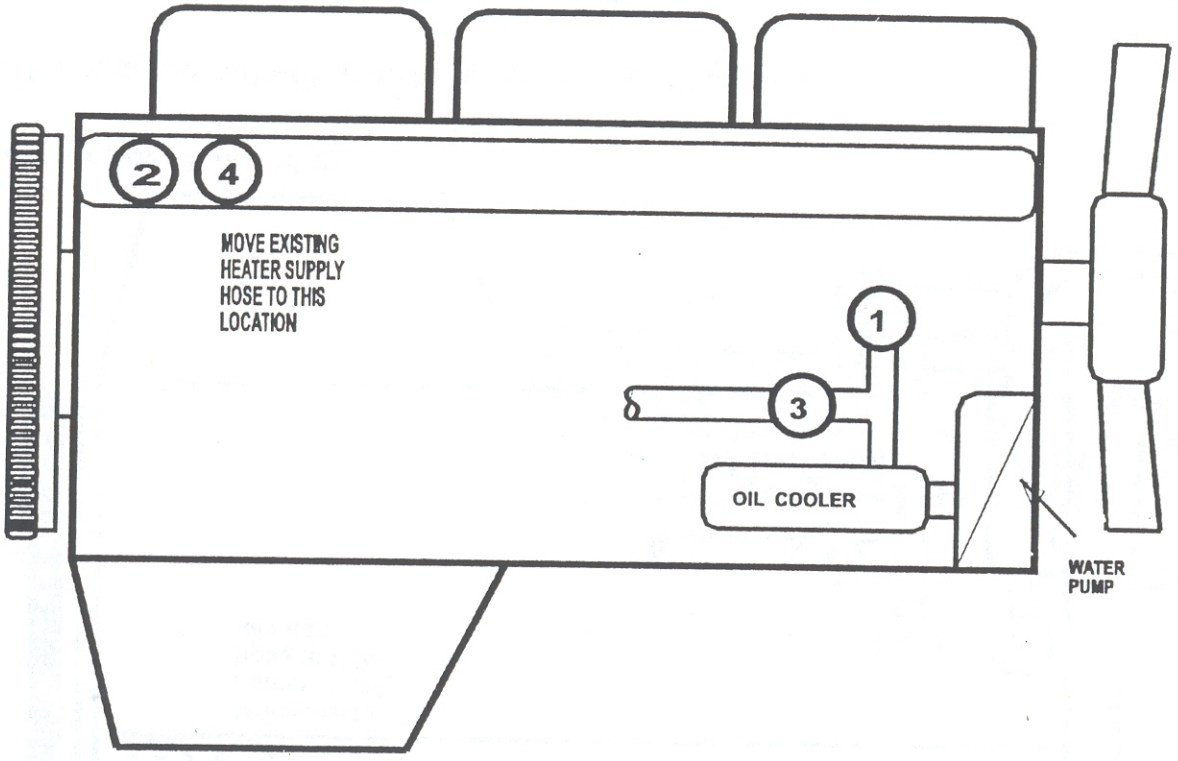
1. To Pony Pack copper inlet tube.
2. From Pony Pack green outlet hose: As close to 4 as possible.
3. Temperature Switch: As far away from 2 as possible.
4. Bosch in-line coolant pump: Installed in the existing heater supply hose with 2.

FIGURE 5: CATERPILLAR Coolant Plumbing Schematic for Freightliner



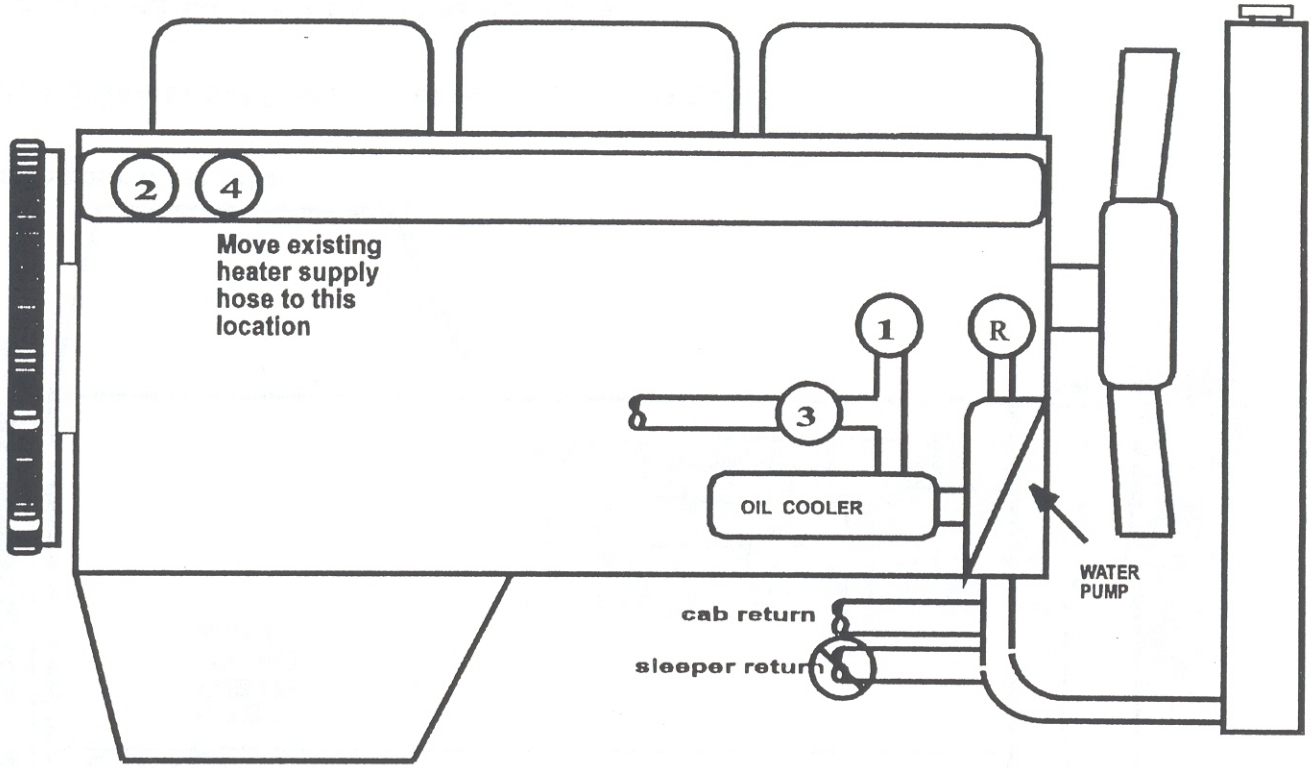
1. To Pony Pack copper inlet tube.
2. From Pony Pack green outlet hose: As close to 4 as possible.
3. Temperature Switch: As far away from 2 as possible.
4. Bosch In-line coolant pump: Installed in the existing heater supply with 2.

FIGURE 6: DETROIT DIESEL Coolant Plumbing Schematic



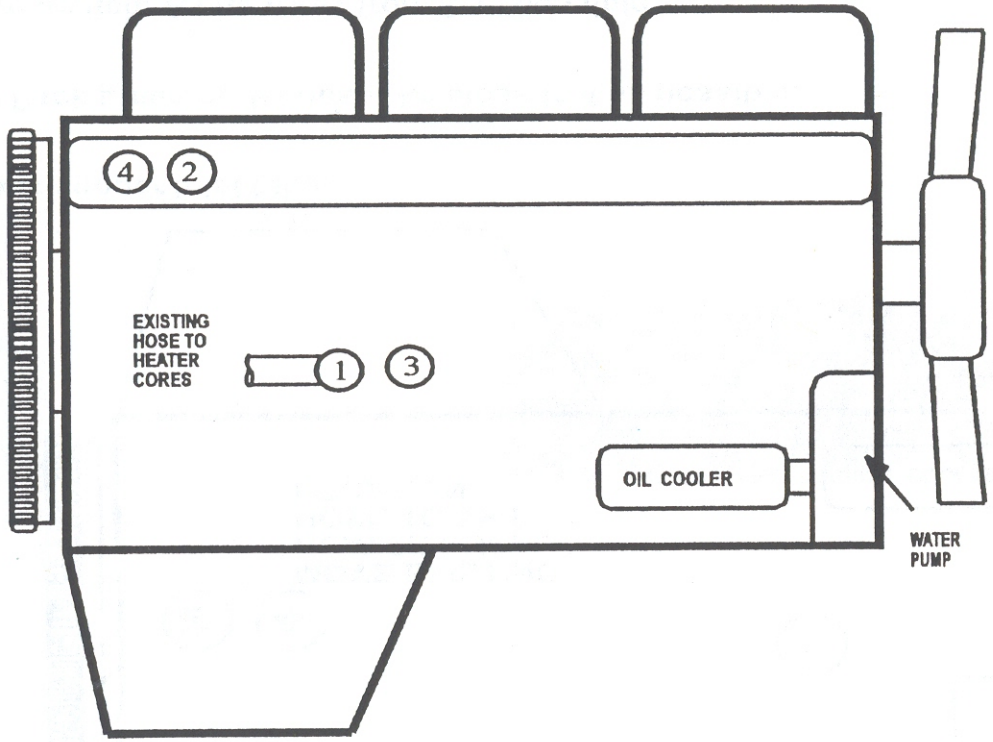
1. **To Pony Pack copper inlet tube.**
2. **From Pony Pack green outlet hose: As close to 4 as possible.**
3. **Temperature Switch: As far away from 2 as possible.**
4. **Bosch In-line coolant pump: Installed in the existing heater supply with 2.**

FIGURE 7: DETROIT DIESEL Coolant Plumbing Schematic for Freightliner



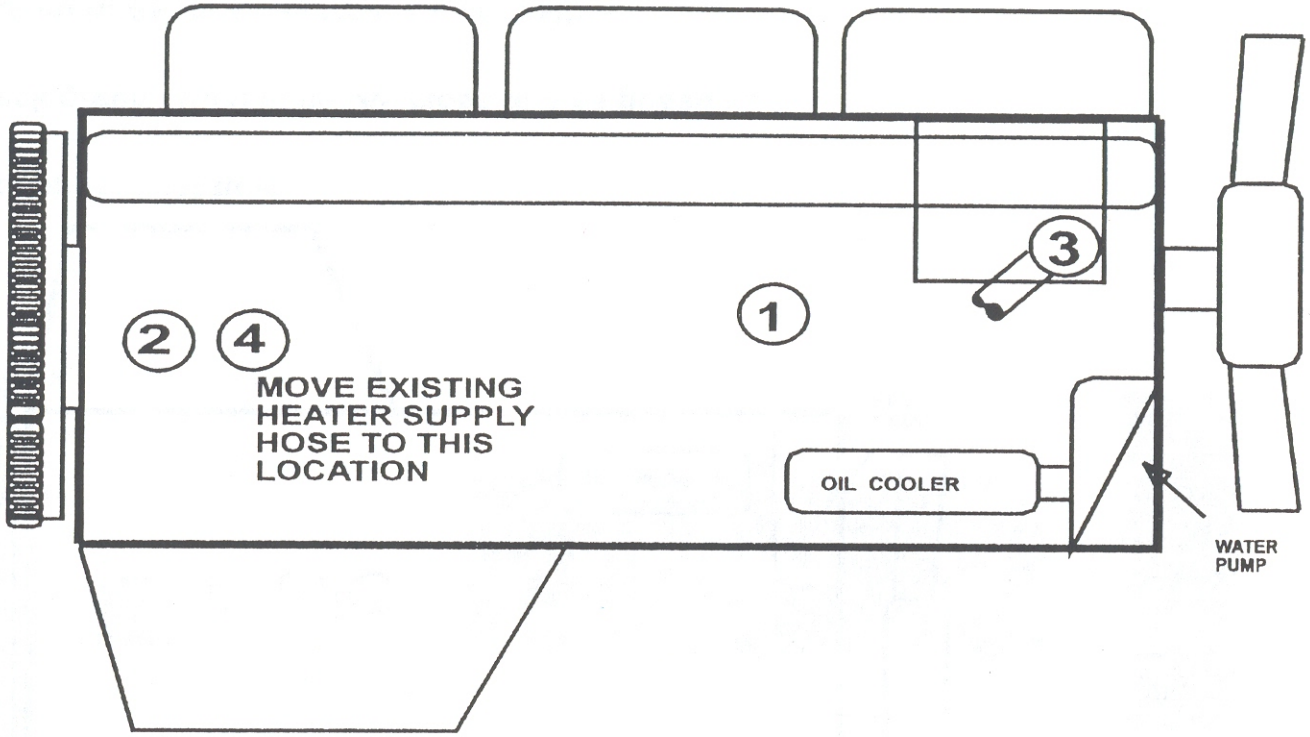
1. To Pony Pack copper inlet tube.
2. From Pony Pack green outlet hose: As close to 4 as possible.
3. Temperature Switch: As far away from 2 as possible.
4. Bosch in-line coolant pump: Installed in the existing heater supply with 2.

FIGURE 8: CUMMINS (Early Model) Coolant Plumbing Schematic



1. To Pony Pack copper inlet tube.
2. From Pony Pack green outlet hose: As close to 4 as possible.
3. Temperature Switch: As far away from 2 as possible.
4. Bosch In-line coolant pump: Installed in the existing heater supply with 2.

FIGURE 9: VOLVO WHITE Coolant Plumbing Schematic



1. To Pony Pack copper inlet tube.
2. From Pony Pack green outlet hose: As close to 4 as possible.
3. Temperature Switch: As far away from 2 as possible.
4. Bosch in-line coolant pump: Installed in the existing heater supply with 2.

FIGURE 12: Freightliner, Marmon, Western Star SW4 wiring

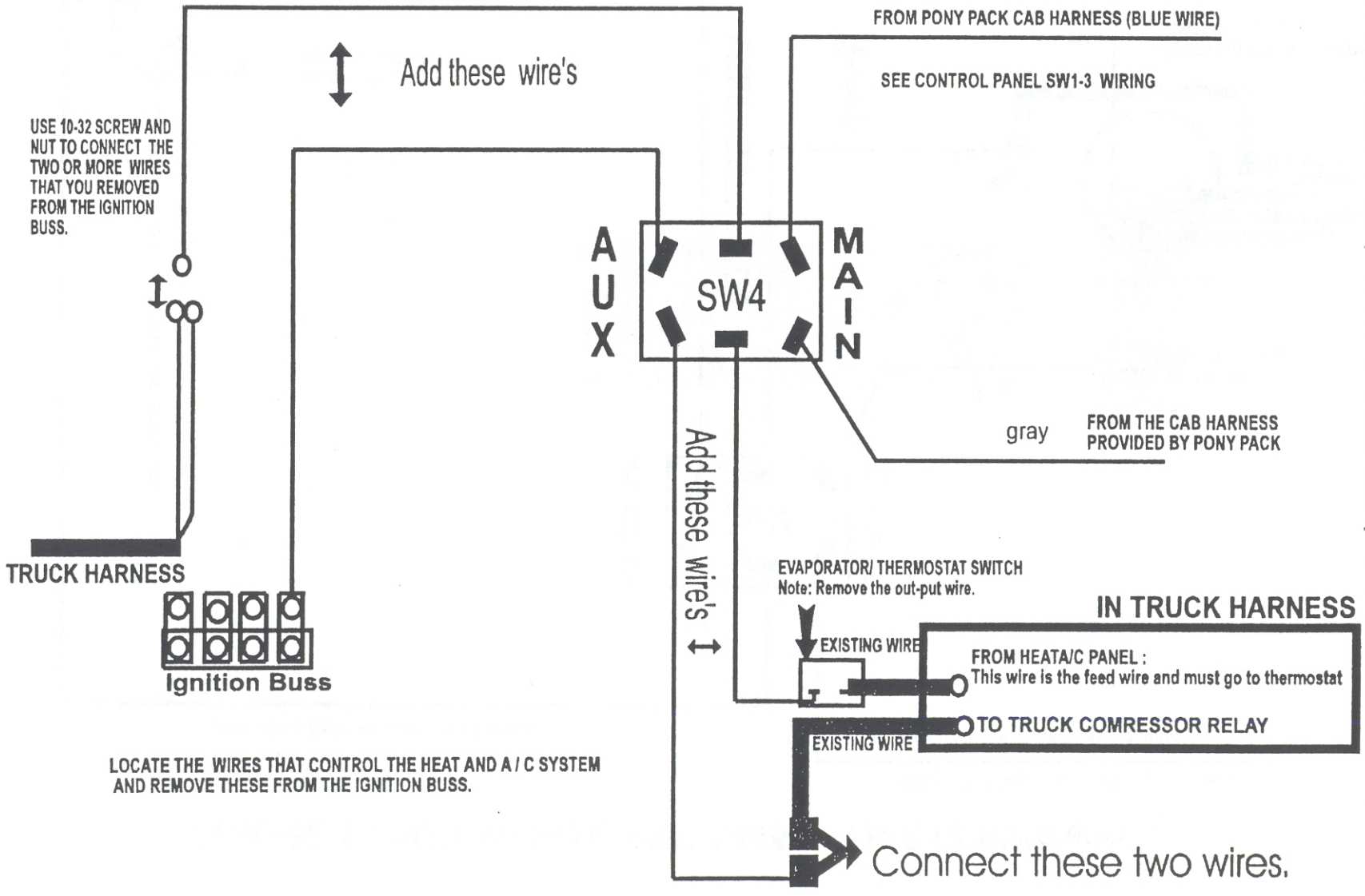


FIGURE 13: KENWORTH PRE 1995 WITH R12 SW4 wiring

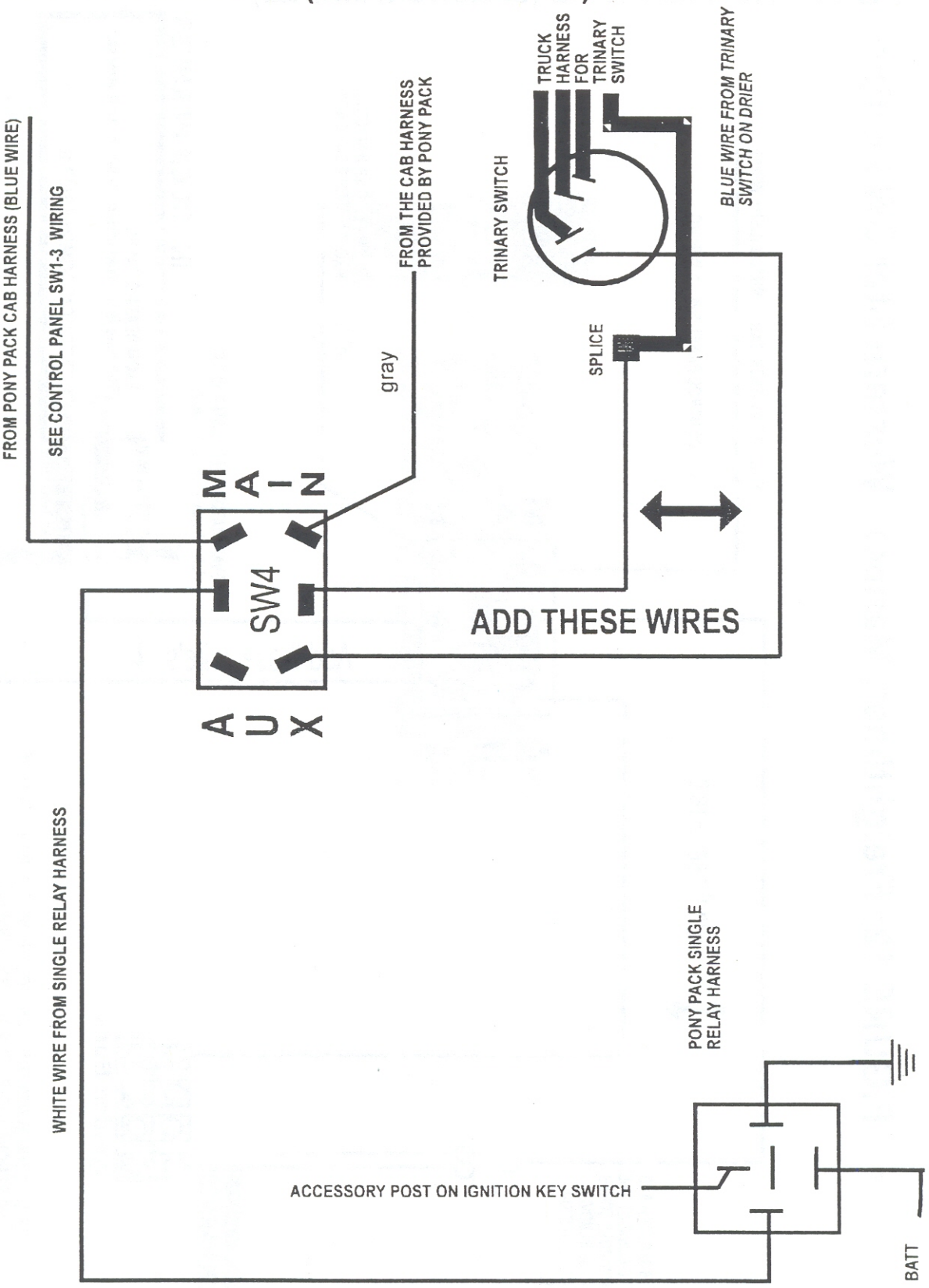
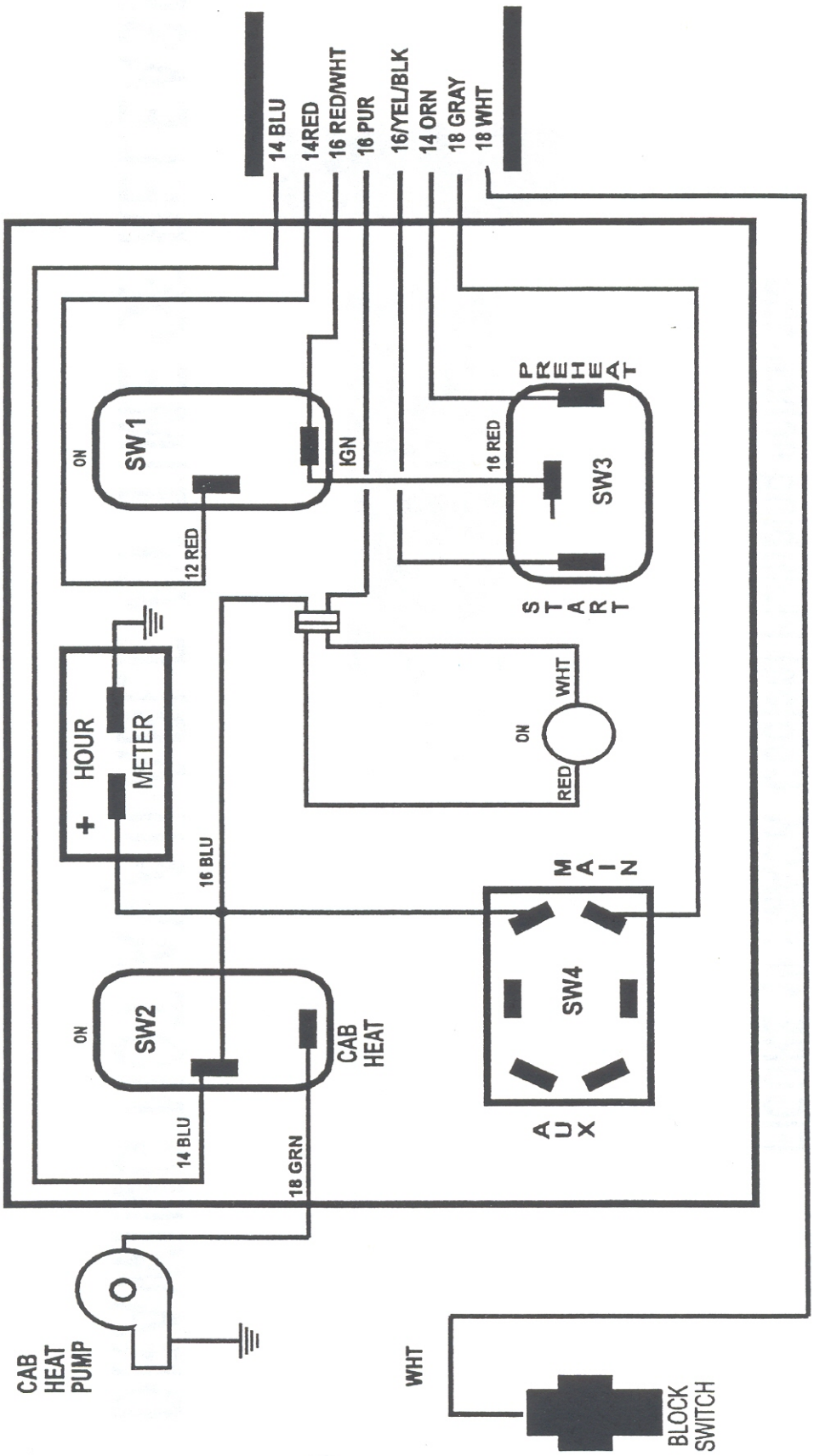


FIGURE 11: CONTROL PANEL WIRING: SW1-3 WIRING REAR VIEW



FOR SWITCH FOUR (4) WIRING SEE THE DRAWINGS FOR YOUR TYPE TRUCK.

PONY PACK® MANUAL (OPERATIONS / INSTALL)

VERY IMPORTANT!

For the new Volvo 770 and the Kenworth T2000 or any other truck with the Index APADS system on the air conditioner : replace the normal air conditioner clutch split instructions with the following:

Out by the air conditioner compressor itself, cut the ground or (n) wire on the truck side of the connector and run two wires back to switch #4.

Wire #1 is connected to the end which comes out of the harness where you made your cut. Wire #1 goes to the center post on switch #4.

Wire #2 is connected to the end which goes on out to the plug itself. Wire #2 then goes back to the truck position on switch #4.

Now, when switch #4 is in the main position, Wire #1 and Wire #2 are connected by switch #4 so that the truck air conditioner clutch is activated as if the unit were not there.

When the switch #4 is in the aux position, Wire #1 is connected to the Pony Pack gray clutch wire by switch #4 to activate the Pony Pack air conditioner compressor clutch.

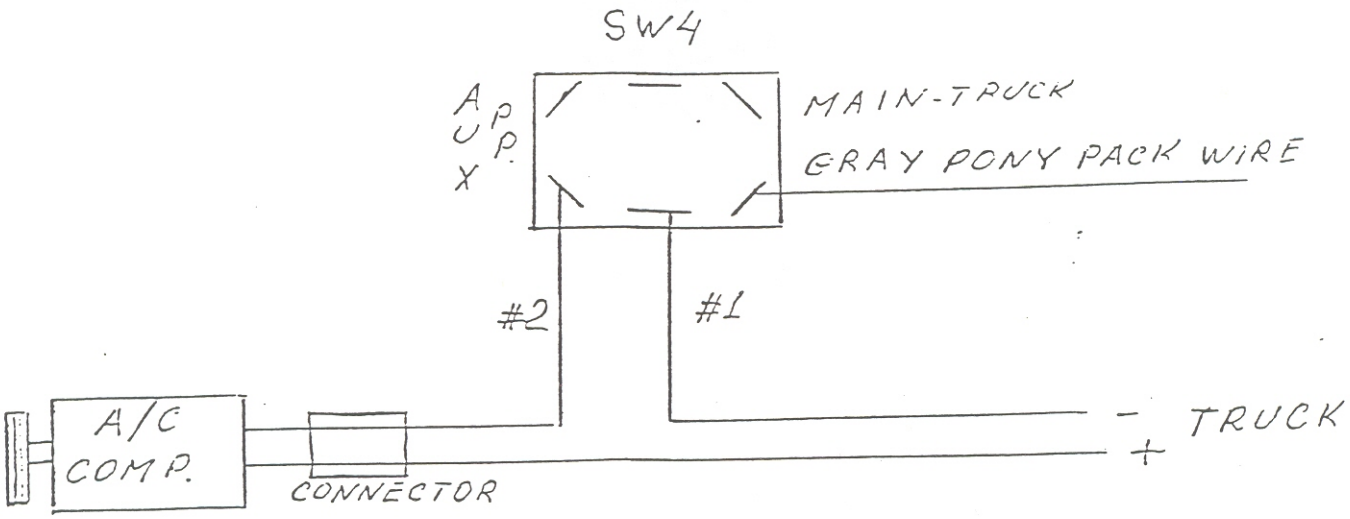
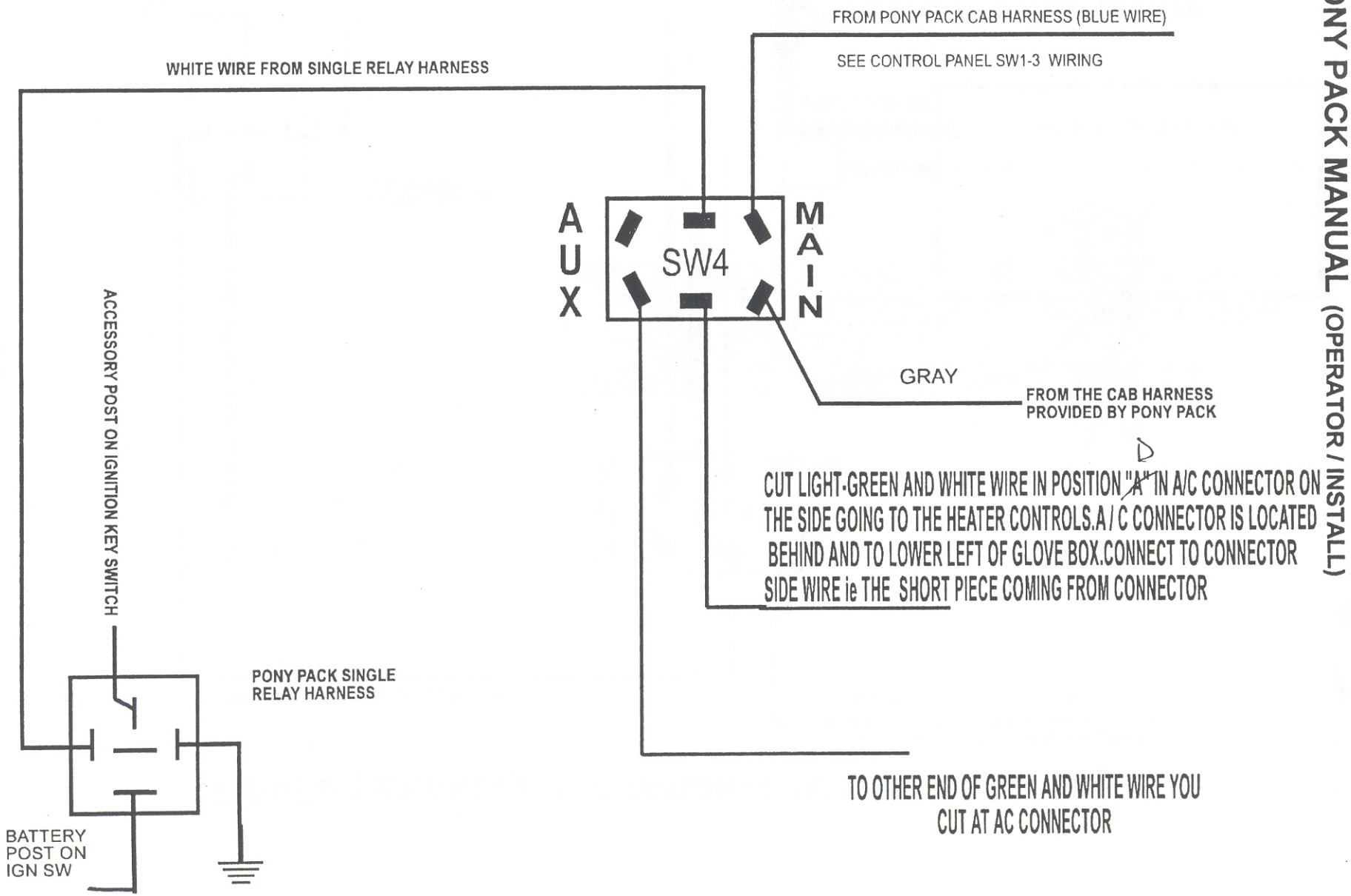


FIGURE 14: KENWORTH 1995 AND LATER WITH R134 SW4 wiring



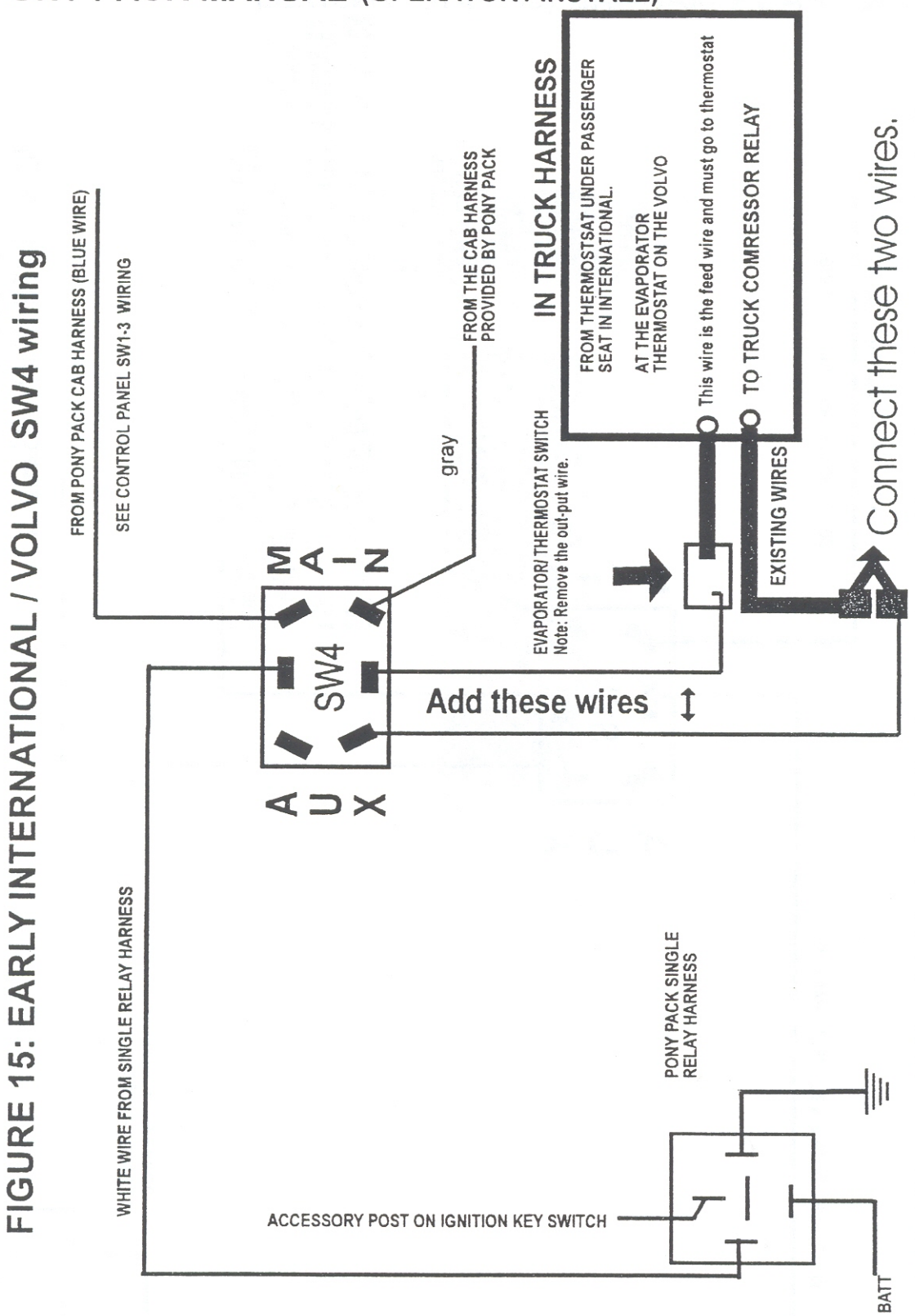


FIGURE 15: EARLY INTERNATIONAL / VOLVO SW4 wiring
FROM PONY PACK CAB HARNESS (BLUE WIRE)
SEE CONTROL PANEL SW1-3 WIRING
FROM THE CAB HARNESS PROVIDED BY PONY PACK
gray
M A I N
SW4
A U X
IN TRUCK HARNESS
FROM THERMOSTSAT UNDER PASSENGER SEAT IN INTERNATIONAL.
AT THE EVAPORATOR THERMOSTAT ON THE VOLVO
This wire is the feed wire and must go to thermostat
TO TRUCK COMRESSOR RELAY
EVAPORATOR/ THERMOSTAT SWITCH
Note: Remove the out-put wire.
EXISTING WIRES
Connect these two wires.
Add these wires
WHITE WIRE FROM SINGLE RELAY HARNESS
PONY PACK SINGLE RELAY HARNESS
ACCESSORY POST ON IGNITION KEY SWITCH
BATT

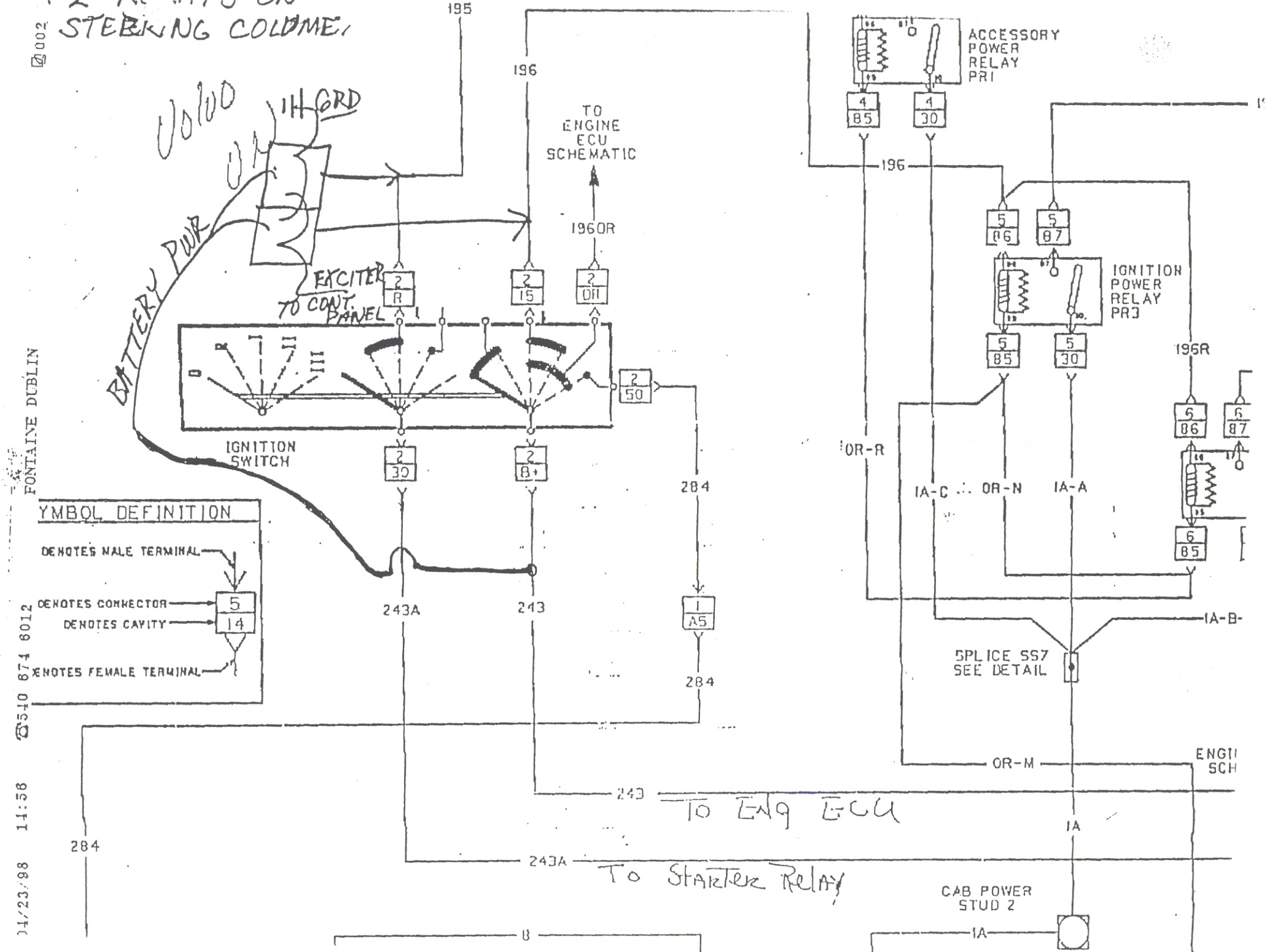

STEERING COLUMN
VOLVO
IH GRD
BATTERY PWR
195
196
TO ENGINE ECU SCHEMATIC
196OR
EXCITER
TO CONT. PANEL
IGNITION SWITCH
ACCESSORY POWER RELAY PR1
IGNITION POWER RELAY PR3
196R
OR-R
IA-C
OR-N
IA-A
IA-B-
SPLICE S57 SEE DETAIL
284
243A
243
OR-M
TO ENG ECU
To Starter Relay
CAB POWER STUD 2
IA
FONTAINE DUBLIN
YMBOL DEFINITION
DENOTES MALE TERMINAL
DENOTES CONNECTOR
DENOTES CAVITY
DENOTES FEMALE TERMINAL
540 674 8012
04/23/98 14:58

FIGURE 16: 1995 and LATER INTERNATIONAL SW4 wiring

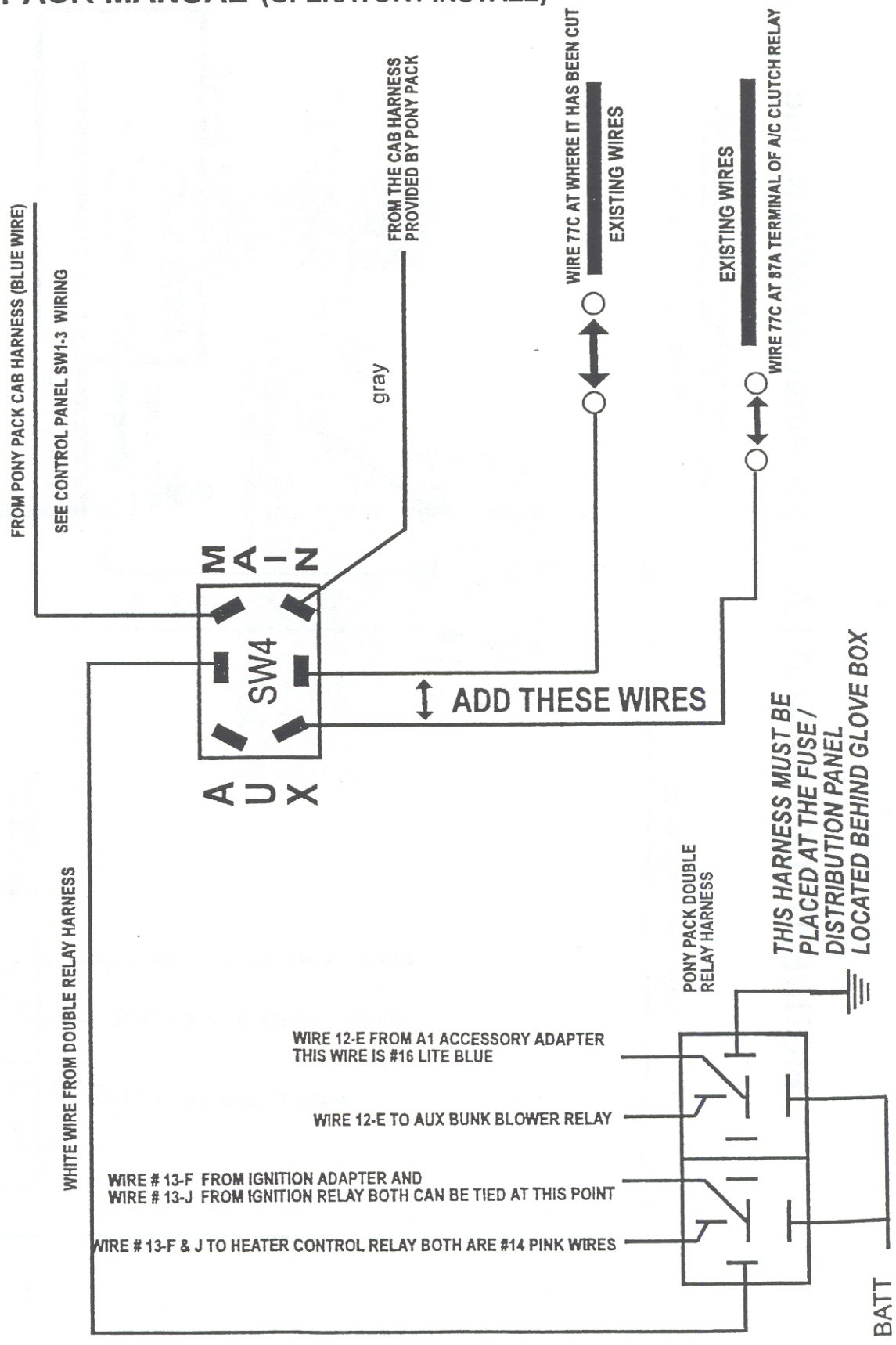
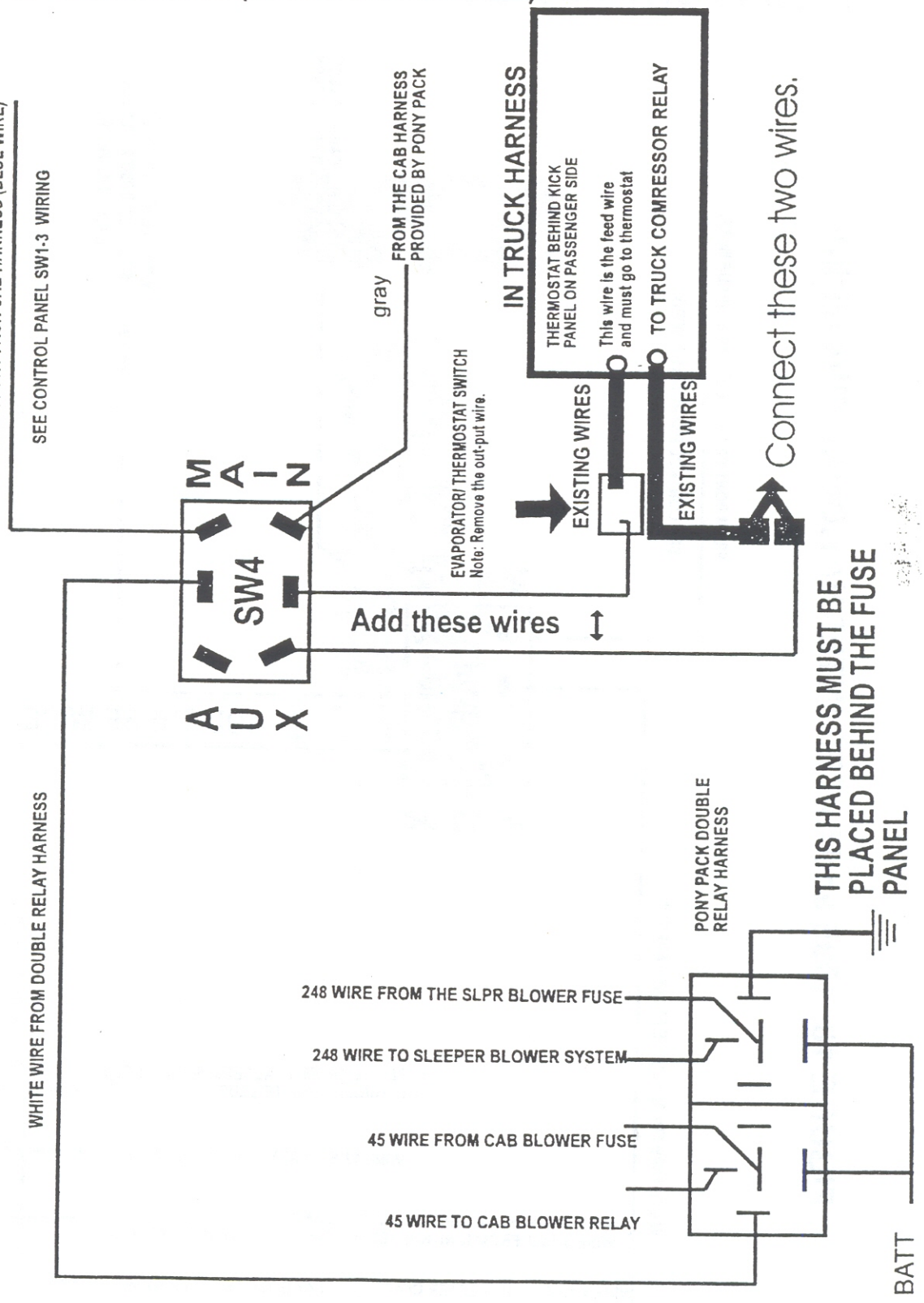


FIGURE 17: OCT 94 AND EARLIER Peterbilt SW4 wiring



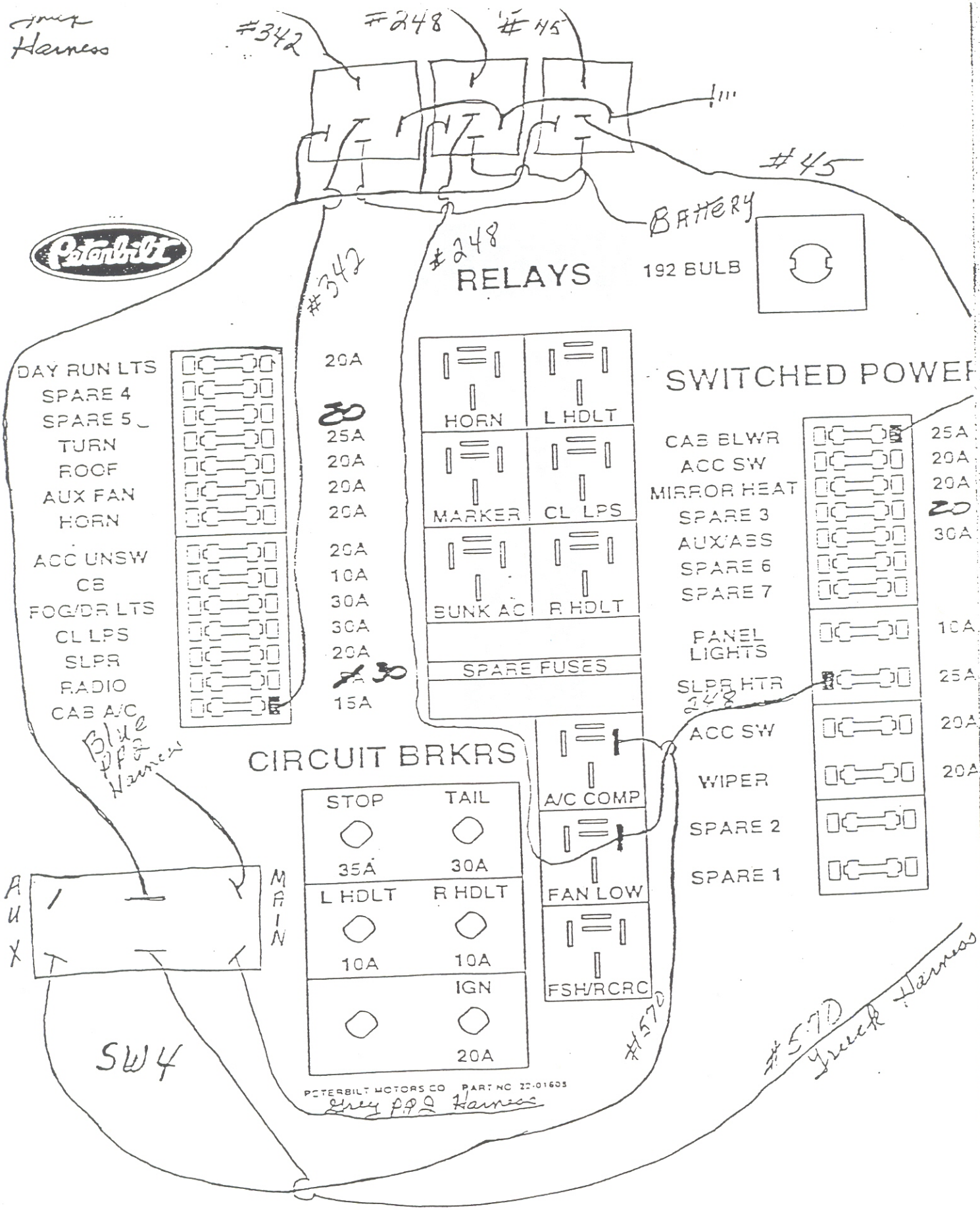

Truck Harness
#342
#248
#45
#45
Battery
192 BULB
Peterbilt
#342
#248
RELAYS
DAY RUN LTS
SPARE 4
SPARE 5
TURN
ROOF
AUX FAN
HORN
ACC UNSW
CB
FOG/DR LTS
CL LPS
SLPR
RADIO
CAB A/C
20A
30
25A
20A
20A
20A
20A
10A
30A
30A
20A
30
15A
HORN
L HDLT
MARKER
CL LPS
BUNK AC
R HDLT
SPARE FUSES
SWITCHED POWER
CAB BLWR
ACC SW
MIRROR HEAT
SPARE 3
AUX ABS
SPARE 6
SPARE 7
PANEL LIGHTS
SLPR HTR
ACC SW
WIPER
SPARE 2
SPARE 1
25A
20A
20A
20
30A
10A
25A
20A
20A
Blue PPG Harness
CIRCUIT BRKRS
STOP
TAIL
35A
30A
L HDLT
R HDLT
10A
10A
IGN
20A
A/C COMP
FAN LOW
FSH/RCRC
#248
#570
#570
Truck Harness
AUX
MAIN
SW4
PETERBILT MOTORS CO PART NO 22-01605
Grey PPG Harness
1998 Peterbilt

FIGURE 18: AFTER OCT 1994 Peterbilt SW4 wiring

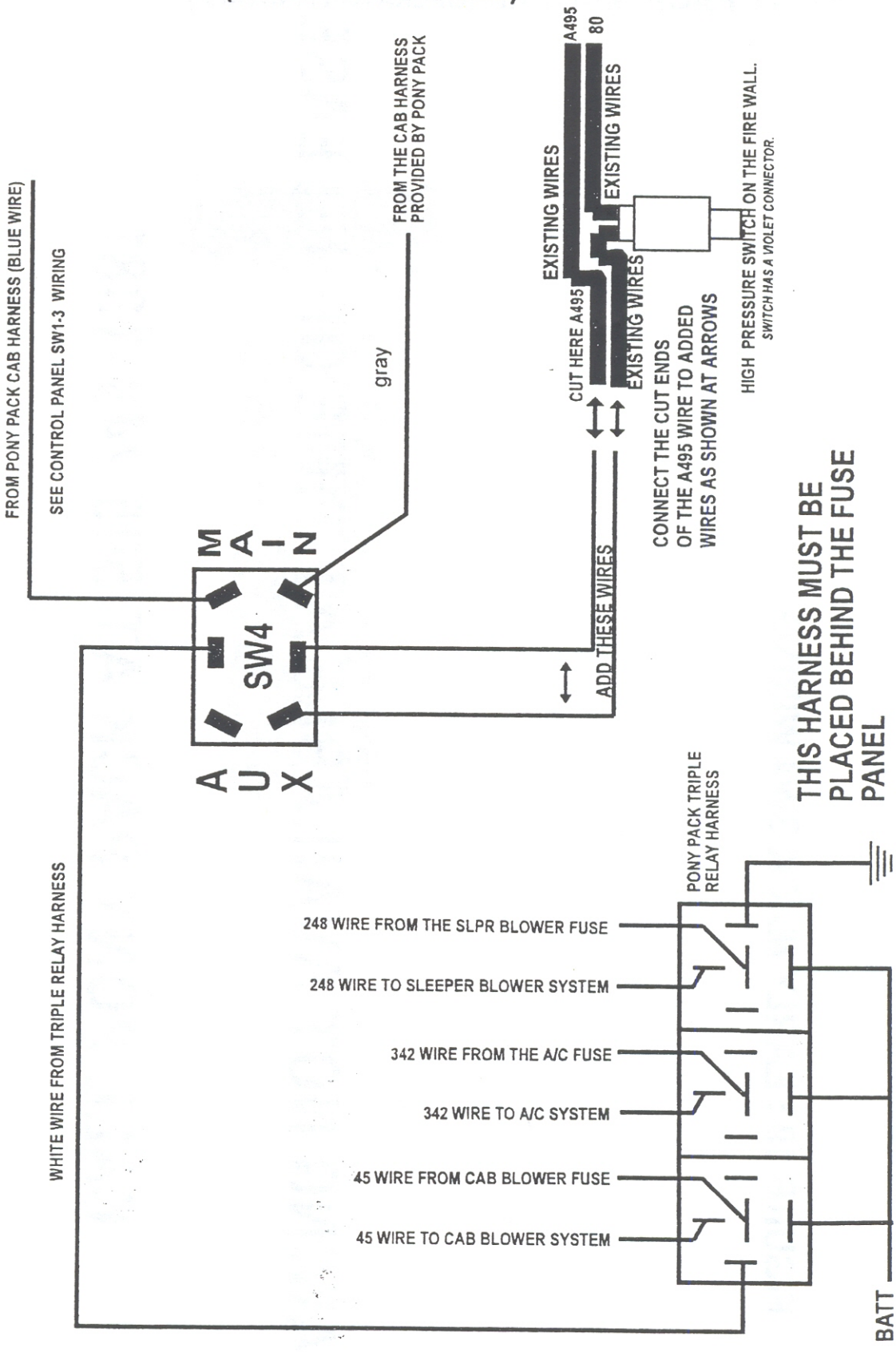
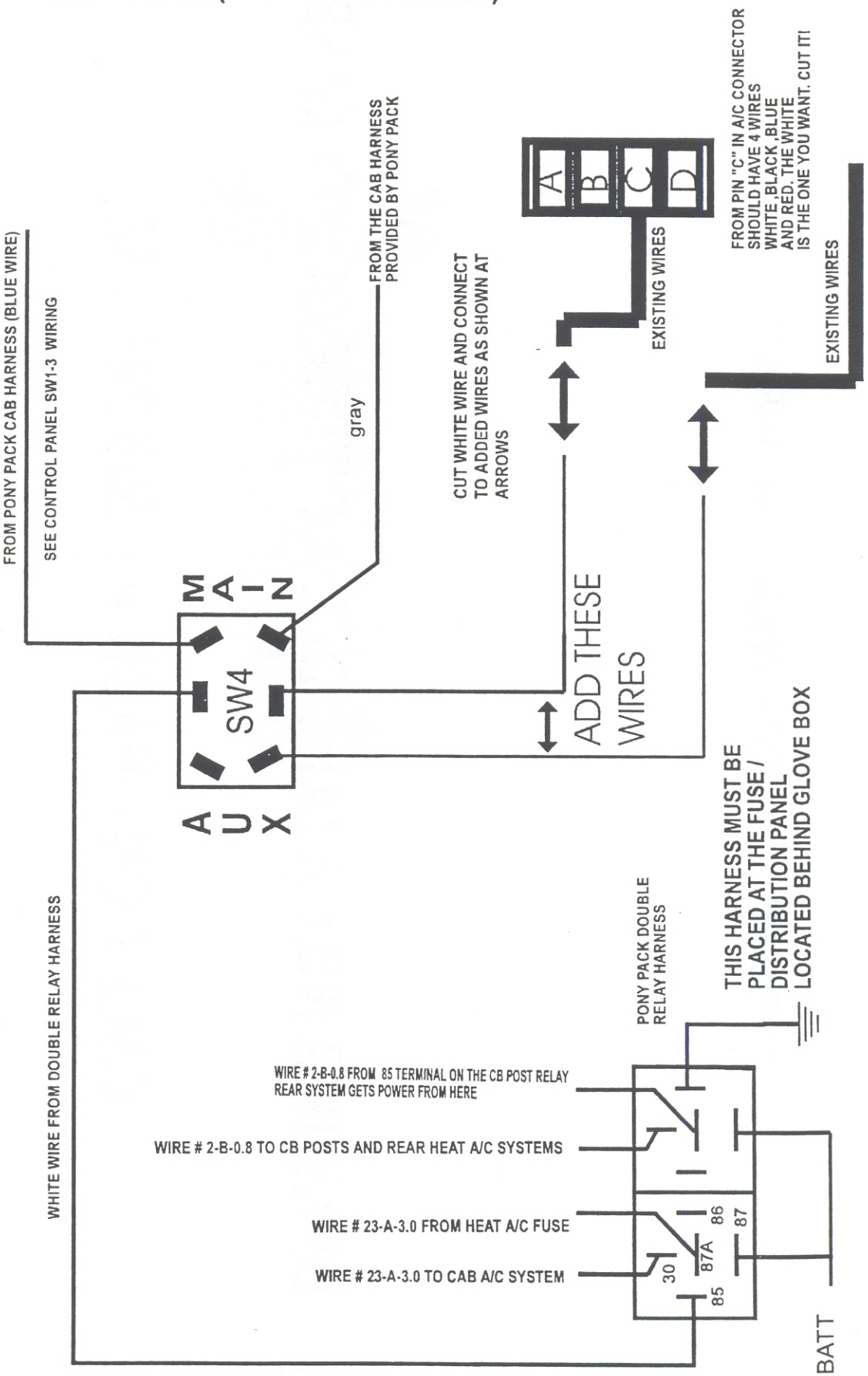
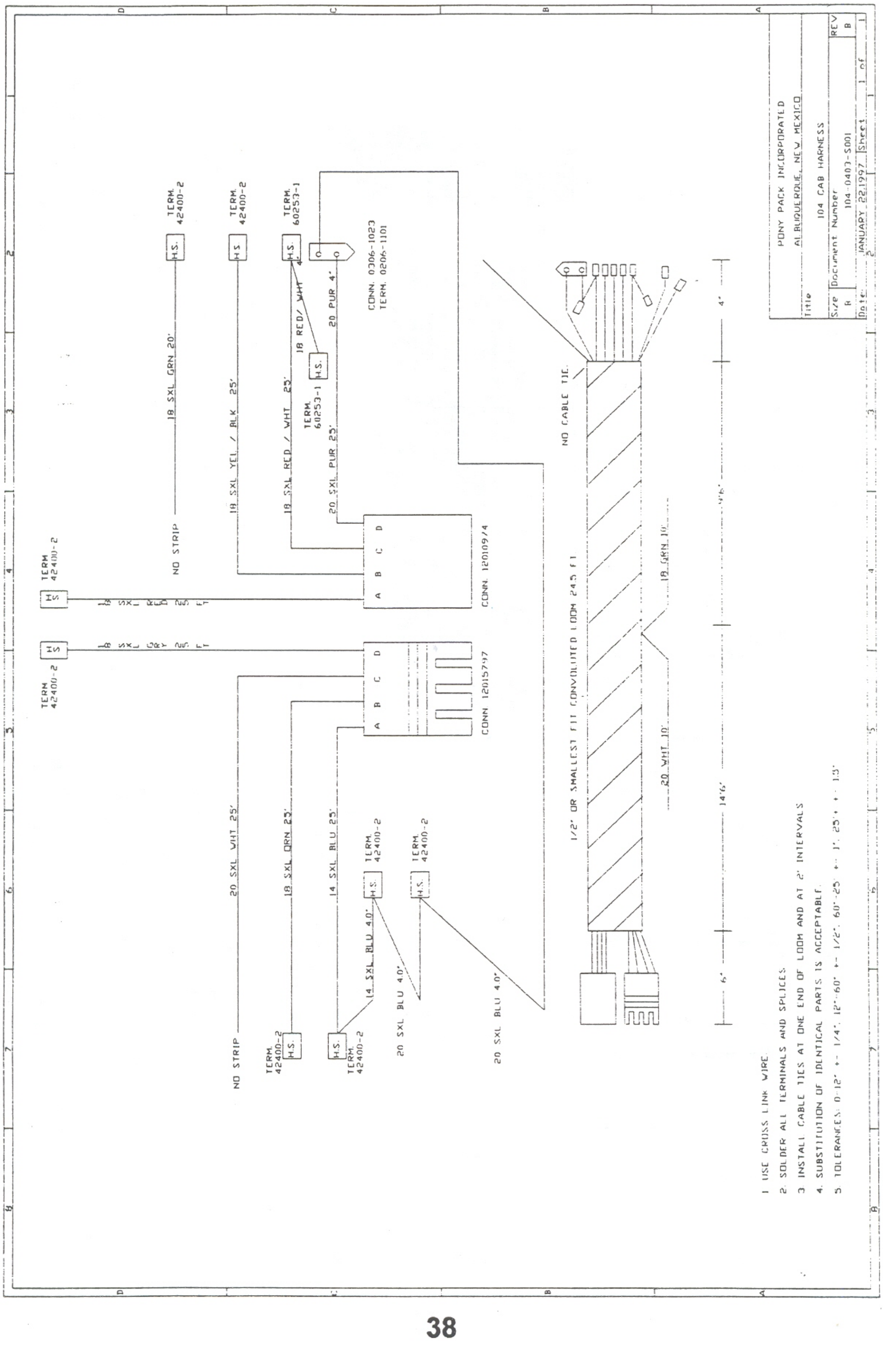


FIGURE 20: 1994 and LATER MACK SW4 wiring




PONY PACK INCORPORATED
ALBUQUERQUE, NEW MEXICO
Title 104 CAB HARNESS
Size B
Document Number 104-0403-S001
REV B
Date JANUARY 22,1997
Sheet 1 of 1
1 USE CROSS LINK WIRE
2 SOLDER ALL TERMINALS AND SPLICES
3 INSTALL CABLE TIES AT ONE END OF LOOM AND AT 2' INTERVALS
4. SUBSTITUTION OF IDENTICAL PARTS IS ACCEPTABLE.
5 TOLERANCES: 0-12' +- 1/4', 12'-60' +- 1/2', 60'-25' +- 1', 25'+ +- 1.5'
1/2" OR SMALLEST FIT CONVOLUTED LOOM 24.5 FT
NO CABLE TIE
CONN. 12010974
CONN. 12015797
CONN. 0306-1023
TERM. 0206-1101
TERM. 42400-2
TERM. 60253-1
H.S.
NO STRIP
18 SXL GRN 20'
18 SXL YEL / BLK 25'
18 SXL RED / WHT 25'
20 SXL PUR 25'
20 PUR 4'
20 SXL WHT 25'
18 SXL ORN 25'
14 SXL BLU 25'
14 SXL BLU 4.0'
20 SXL BLU 4.0'
18 GRN 10'
20 WHT 10'

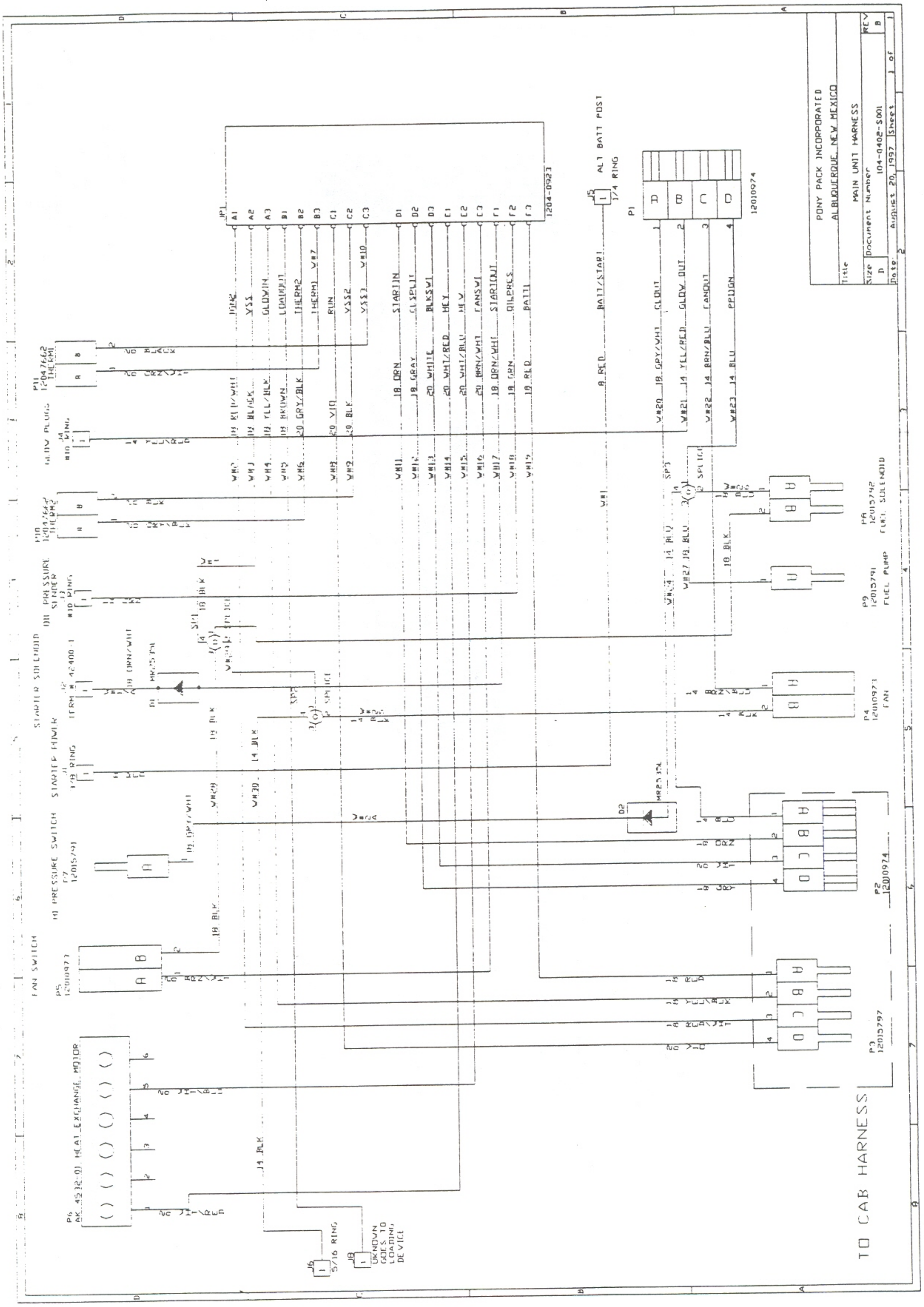
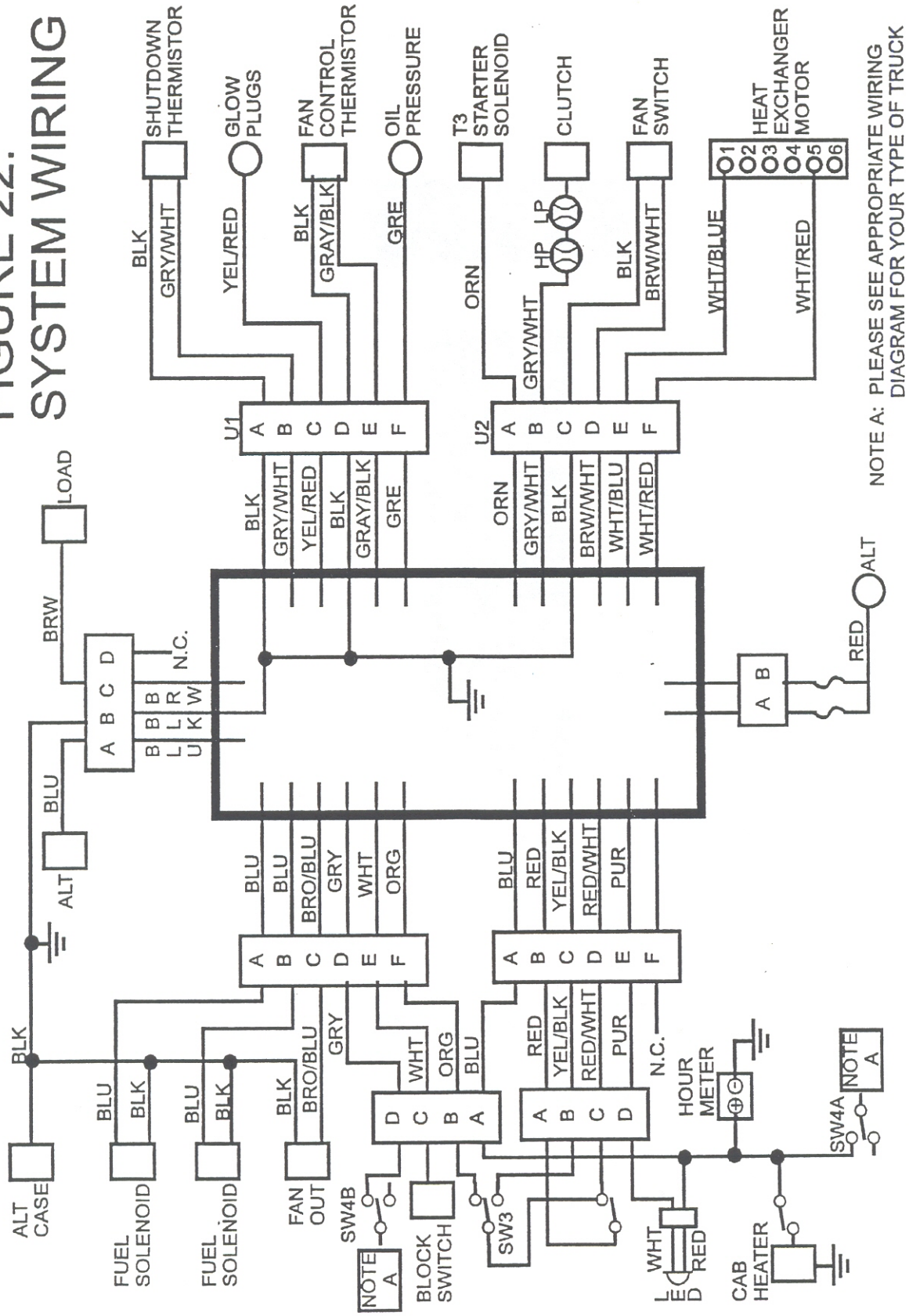

PONY PACK INCORPORATED
ALBUQUERQUE, NEW MEXICO
MAIN UNIT HARNESS
104-0402-S001
August 20, 1997
TO CAB HARNESS

FIGURE 22: SYSTEM WIRING



PONY PACK MANUAL (OPERATOR / INSTALL)

PONY PACK® PARTS LIST

PART NUMBER	DESCRIPTION	VENDOR	VENDOR PART
	General		
104-0100	Engine	Kubota, Ltd.	Z482B
104-0101	Steel Mounting Frame	Pony Pack, Inc.	
104-1102	Unit Base Plate	Pony Pack, Inc.	
104-0103	Mounting Frame Stiffeners	Pony Pack, Inc.	
104-0104	Cupmount (front)	Barry Controls	UC-2404-T6
104-0105	Elastomeric Mount (rear)	Barry Controls	633A-130
104-0107	Idler Pulley	Dayco	39
104-0108	Idler Pulley Bolt	Pony Pack, Inc.	
104-0109	Idler Spacer	Pony Pack, Inc.	
104-0110	Drivebelt Idler Nut	Varies	7/16" SAE Flange
104-0604	Idler Bracket (drivebelt)	Pony Pack, Inc.	
104-0605	Idler Bracket Brace	Pony Pack, Inc.	
104-0111	Muffler	Pony Pack, Inc	
104-0112	Muffler Clamp	Varies	1-1/4" Exhaust
104-0113	Drivebelt	Gates	K060436
104-0114	Waterpump Belt	Gates	7250
104-0118	Radiator to Engine Hose	Pony Pack, Inc	
104-0119	Engine to Heat Exchanger Hose	Pony Pack, Inc	
104-0120	Heat Exchanger to Truck Hose	Pony Pack, Inc	
	Air Conditioning		
104-0200	Compressor	Sanden Intl. (USA)	SD508-U9537
104-0201	Condenser	Pony Pack, Inc.	
104-0202	Radiator	Pony Pack, Inc.	
104-0203	Fan	Bosch	0130303805
104-0204	Shroud	Pony Pack, Inc	
104-0206	Suction Line	Pony Pack, Inc	
104-0207	Accumulator Assembly	Pony Pack, Inc.	
104-0208	Discharge Line	Pony Pack, Inc.	
104-0209	Fan Switch	Kysor	404163
104-1210C	High Pressure Switch	Index Industries	8040171
104-0211	Low Pressure Switch	Kysor	404143
104-0212	Shunt Valve	Pony Pack, Inc.	
104-0213	Suction Tee	Pony Pack, Inc.	
	Heat Exchanger		
104-2300	Heat Exchanger (complete)	Pony Pack, Inc.	
104-1301C	Cleanout Cover Plate	Pony Pack, Inc.	
104-0305	Insulation Cover w/ Blanket	Pony Pack, Inc.	

PART NUMBER	DESCRIPTION	VENDOR	VENDOR PART
104-0306	Manifold Spacer Plate	Pony Pack, Inc.	
104-0307	M6 Manifold Stud	Kubota, Ltd.	01513-50630
104-0308	Cleanout Stud	Varies	(1/4-20) x 1-1/4" x (1/4-28)
104-0309	Manifold Gasket	Pony Pack, Inc.	
104-0312	Cleanout Cover Gasket	Pony Pack, Inc.	
104-0612	Linkage Spring	McMaster-Carr	96605K44
104-0606	HE Motor Mount	Pony Pack, Inc.	
104-0607	HE Motor Arm	Pony Pack, Inc.	
104-0608	HE Motor Linkage	Pony Pack, Inc.	
	Electrical		
104-0401	Alternator	Delco-Remy	1101475CS130
104-0601	Lower Alternator Bracket	Pony Pack, Inc.	
104-0609	Upper Alternator Bracket	Pony Pack, Inc.	
104-0402	Unit Wire Harness	Pony Pack, Inc.	
104-0403	Cab Wire Harness, 25'	Pony Pack, Inc.	
104-0404	Electronic Control Module	Pony Pack, Inc.	
104-0405	Ground Cable, 6"	Pony Pack, Inc.	
104-2406	Control Panel (complete)	Pony Pack, Inc.	
104-0407	2-Toggle Switch	Carling Switch	2FA53-73-Tabs
104-0408	3-Tab Toggle Switch	Carling Switch	6FC53-73-Tabs
104-0409	6-Tab Toggle Switch	Carling Switch	2GL51-73
104-1410	L.E.D Terminated	Pony Pack, Inc.	
104-0411	Relays	Aromat, 40 Amp	CBIE-DC12V
104-0415	175^0 Temperature Sensor	Index Industries	TB201A5-175
104-0417	Thermistor	Pony Pack, Inc.	
104-0418	Heat Exchanger Motor	Bosch	
104-0419	Cab Heat Pump	Bosch	130002066
104-0420	Electric Fuel Pump	Kubota, Ltd.	68371-51211
	Fuel System		
104-0133	Air Intake Hose	Pony Pack, Inc.	
104-0134	Silencer Funnel	Pony Pack, Inc.	
104-0135	Silencer	Pony Pack, Inc.	
104-1503	Fuel Shut-Off Solenoid	Pony Pack, Inc.	
104-1504	Fuel Return Chk Valve Assy.	Pony Pack, Inc.	
104-0505	Unit Return Fuel Tee	Weatherhead	1904
104-0507	Drop In Fuel Filter	Kubota, Ltd.	15231-43560
104-0508	In Line Fuel Filter	Kubota, Ltd.	15351-43010
104-0510	Air Filter	Baldwin Filters	PA2832
104-0603	Fuel Filter Bracket	Pony Pack, Inc.	

PONY PACK MANUAL (OPERATOR / INSTALL)

PART NUMBER	DESCRIPTION	VENDOR	VENDOR PART
	Unit Cover		
104-0700	Unit Cover	Pony Pack, Inc.	
104-2700	Unit Cover Complete	Pony Pack, Inc.	
104-0701	Cover Insulation Panels	Pony Pack, Inc.	
104-1702	Cover Rubber Latch Ass'y	Pony Pack, Inc.	
104-0703	Cover Handle	Pony Pack, Inc.	
104-0704	"WARNING" Label	Pony Pack, Inc.	
104-0705	"NO STEP" Label	Pony Pack, Inc.	
104-0706	Logo Plate	Pony Pack, Inc.	

FILTERS CROSS-REFERENCE LIST

	Oil Filter	In Line Fuel Filter	Drop In Fuel Filter	Air Filter
Baldwin	B179	BF840	PF872	PA2832
Carquest	85334			
Donaldson				ECD045003
Fram	PH3593A			
Kubota	70000-15241	13351-43010	15231-43560	
Lubefiner	PH2802			
AC	PF1127			
Transicold	2535206			
Wix	51064			
Yanmar	124450-35100			
STP	SO2808			