

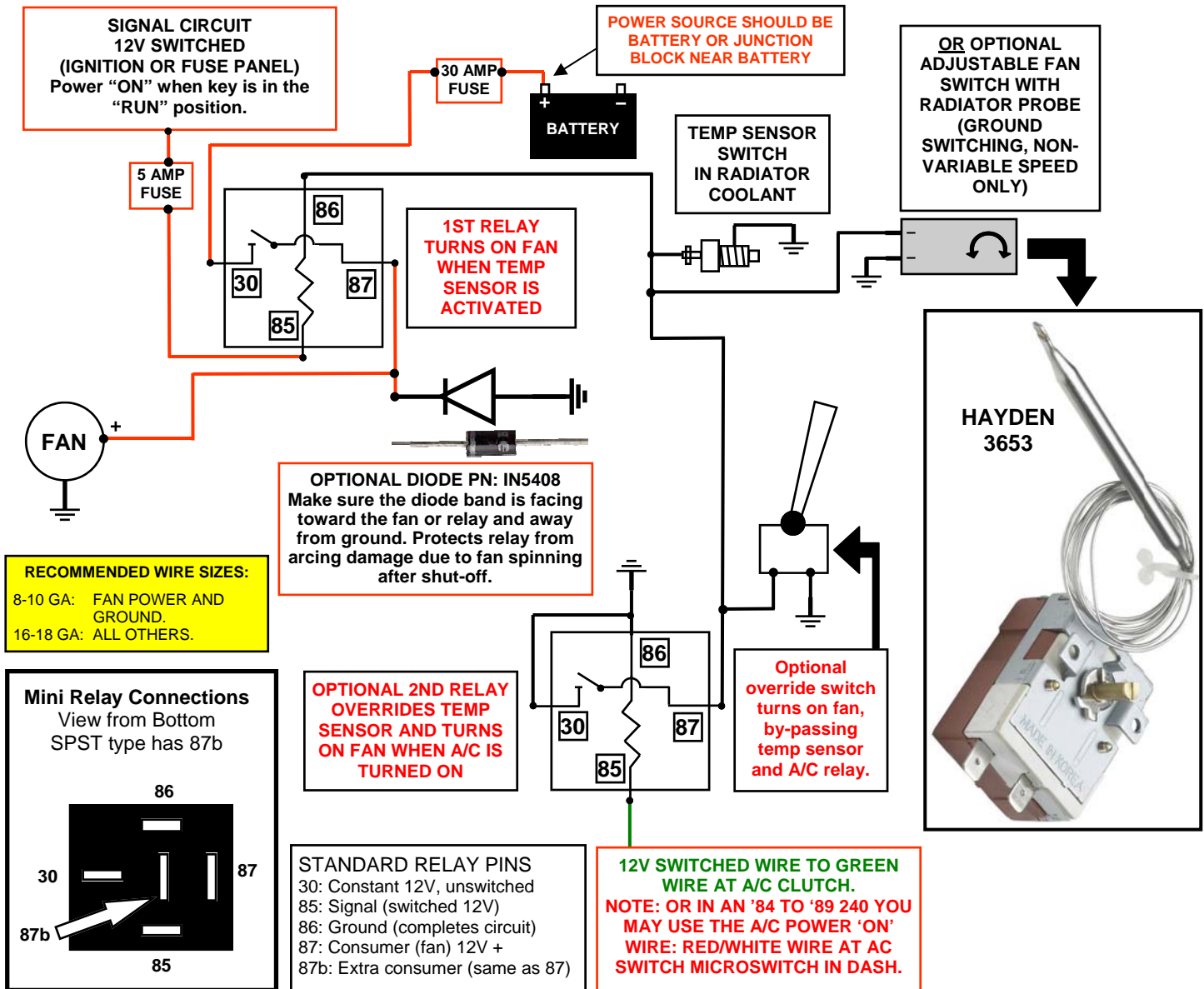
Suggested Electric Fan Wiring Diagrams

These diagrams show the use of relays, ON/OFF sensors, ON/OFF switches and ON/OFF fan controllers. Nothing here should be confused with the latest generation of PWM VARIABLE SPEED CONTROLLERS, which have much higher technology, such as a soft start feature and smooth ramping, but not necessarily better durability.

Suggested Primary Cooling Fan - Single Speed (ON/OFF)

Using Ground Switching Devices Only for Primary Activation. A Ground Switched Device is one that provides a grounded output upon activation instead of a voltage output.

Updated: 08/28/16



SPST vs SPDT Relays. What's the difference?

Single Pole, Single Throw (SPST): This relay will be identified as having a middle 87b spade (or no middle spade at all). This is the most common relay used for fog lights or other simple circuits. If there is a middle 87b pin, it will have power whenever there is power to the 87 (whenever relay is "activated"). This way the middle 87b pin may be used as an extra power output.

Single Pole, Double Throw (SPDT): If you have a relay with an 87a pin in the middle spot, it is a SPDT relay, sometimes called a "changeover relay." This type of relay will work for this application also, but you will not use pin 87a. In a changeover relay, the 87a pin will be "HOT" anytime the 87 pin is "OFF," so long as power is connected to pin 30.

Thanks go to Bob Wilson (volvodad on Brickboard) for contributing to these differences.

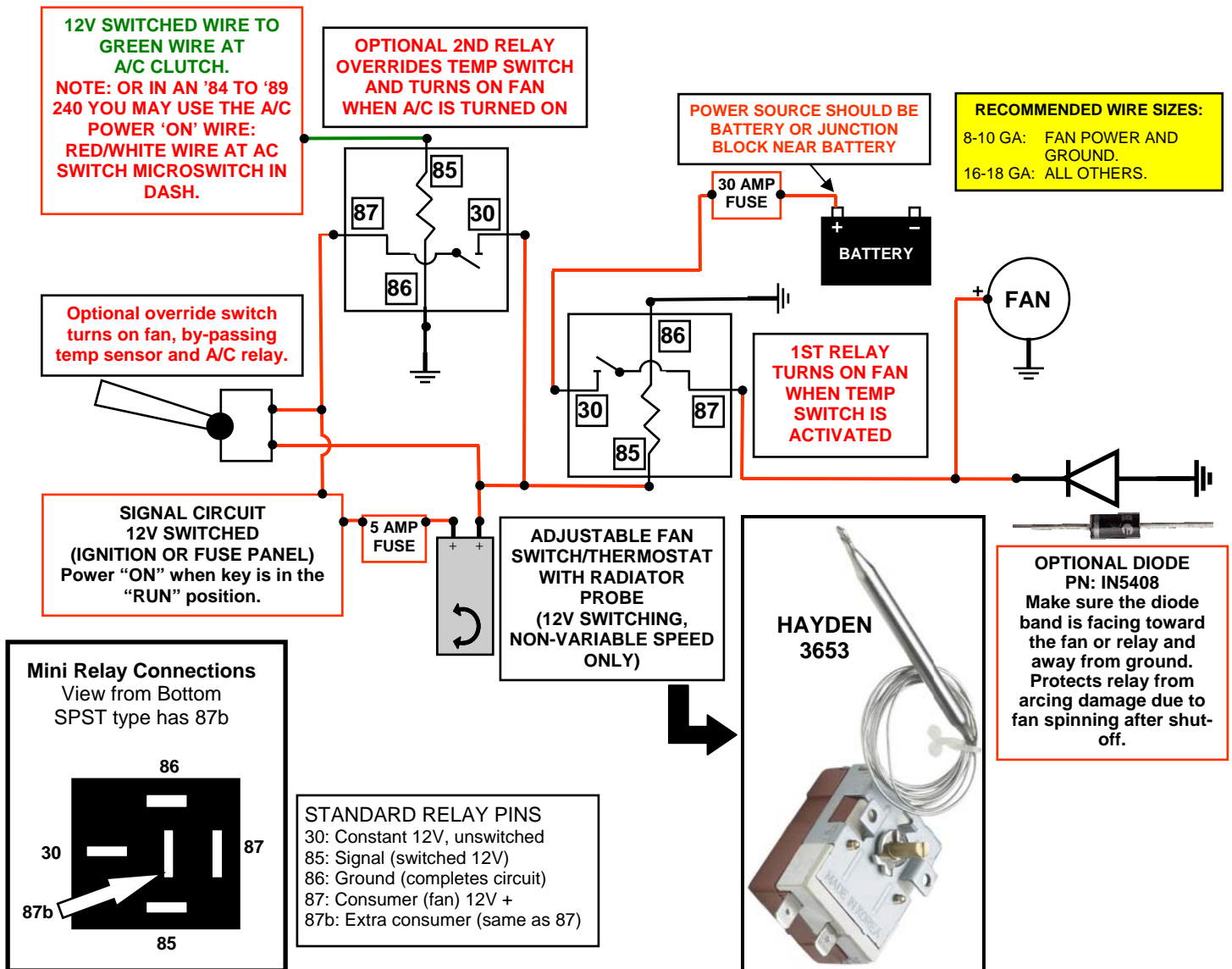
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Using 12 Volt Switching Devices Only for Primary Activation

NOTE: Most stand-alone adjustable thermostats (i.e.: Hayden, Flex-a-Lite or Perma-Cool brands) can provide a 12 volt output when activated. Relays shown in these diagrams can provide options for useful features such as an AC override ON and/or manual override ON.



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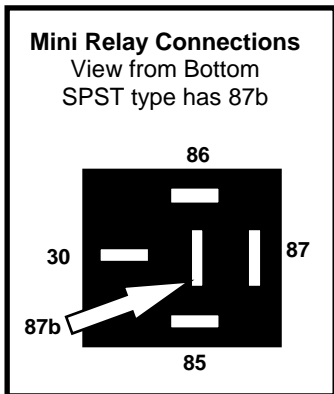
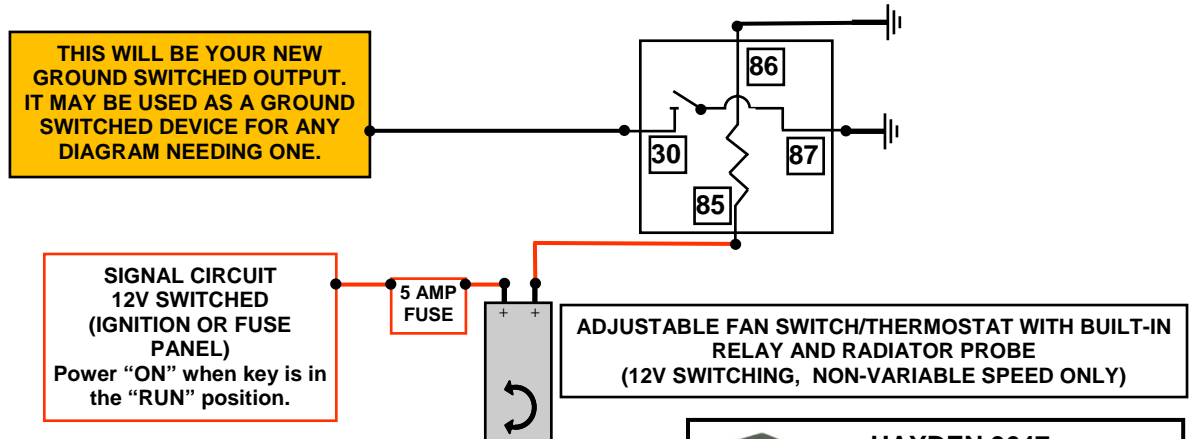
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Converting a 12 Volt Switch into a Ground Switch

If you have an adjustable thermostat that uses 12 VOLT SWITCHING ONLY, such as the popular Hayden or Flex-a-Lite brand thermostats with built-in relays, you may normally only use it with a diagram use it with any diagram showing a need for a 12 VOLT SWITCHED DEVICE. if you follow these steps you may convert it to a GROUND SWITCHED DEVICE using a simple SPST relay.



RECOMMENDED WIRE SIZES:
8-10 GA: FAN POWER AND GROUND.
16-18 GA: ALL OTHERS.

STANDARD RELAY PINS
30: Constant 12V, unswitched
85: Signal (switched 12V)
86: Ground (completes circuit)
87: Consumer (fan) 12V +
87b: Extra consumer (same as 87)



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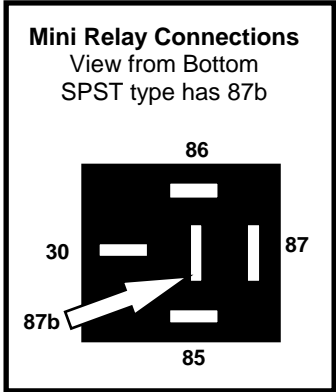
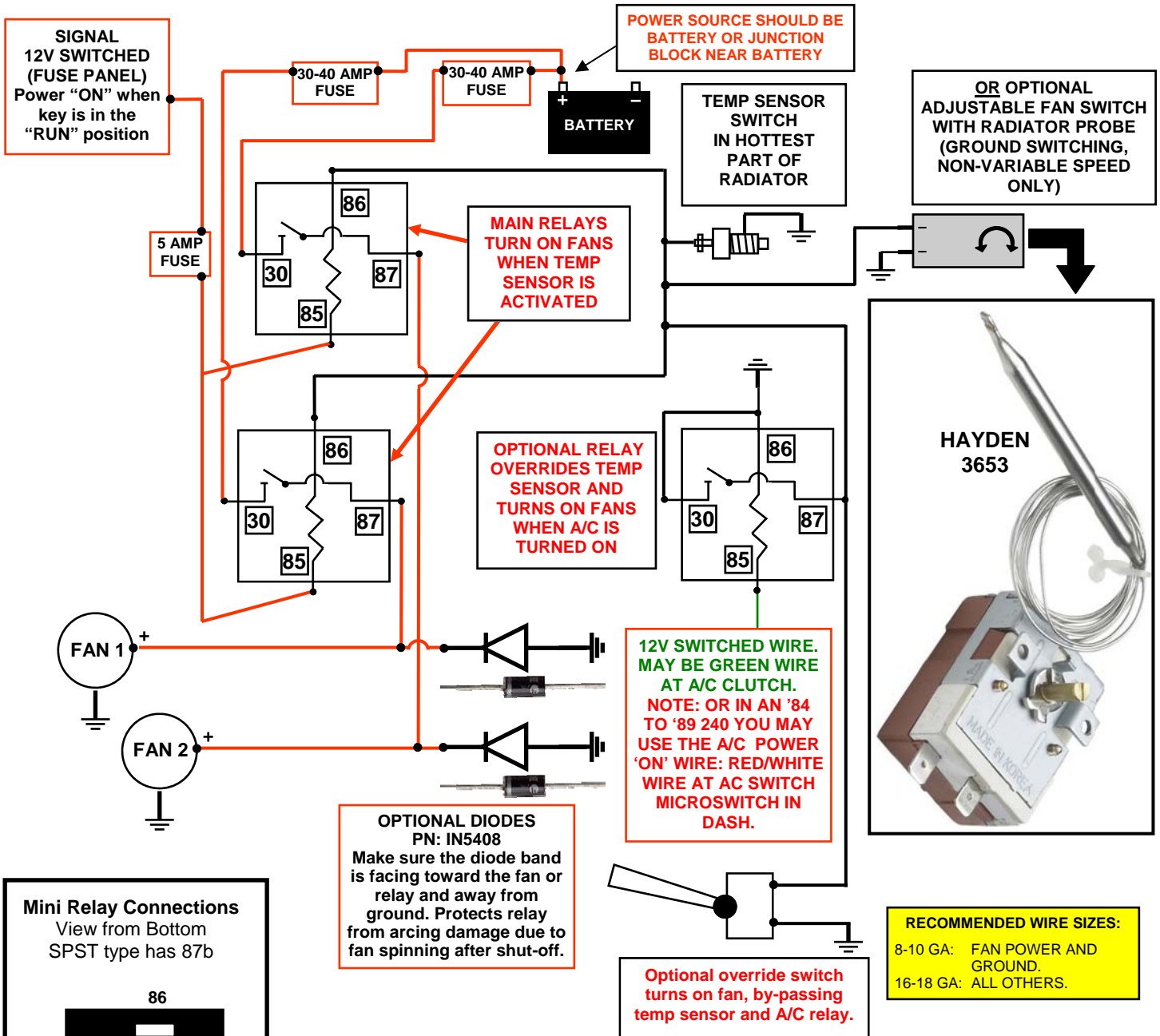
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PRIMARY COOLING FAN

DUAL FANS (with Dual Relays) - SINGLE SPEED (ON/OFF)

Using Ground Switched Devices Only for Primary Activation

Using dual relays for two fans is not required. You could use one relay. However two relays will divide the load. And if a relay fails, you will still have one fan running.



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30: Constant 12V, unswitched
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12V SWITCHED WIRE TO GREEN WIRE AT A/C CLUTCH.
NOTE: OR IN AN '84 TO '89 240 YOU MAY USE THE A/C POWER 'ON' WIRE: RED/WHITE WIRE AT AC SWITCH MICROSWITCH IN DASH.

OPTIONAL AC RELAY OVERRIDES TEMP SWITCH AND TURNS ON FANS WHEN A/C IS TURNED ON

POWER SOURCE SHOULD BE BATTERY OR JUNCTION BLOCK NEAR BATTERY

OPTIONAL DIODE PN: IN5408
 Make sure the diode band is facing toward the fan or relay and away from ground. Protects relay from arcing damage due to fan spinning after shut-off.

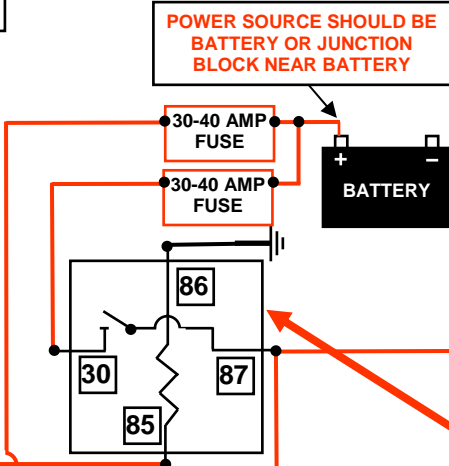
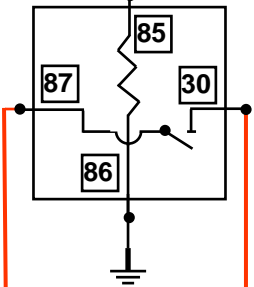
Optional override switch turns on fans, by-passing temp sensor and A/C relay.

SIGNAL CIRCUIT 12V SWITCHED (IGNITION OR FUSE PANEL)
 Power "ON" when key is in the "RUN" position.

ADJUSTABLE FAN SWITCH/THERMOSTAT WITH RADIATOR PROBE (12V SWITCHING, NON-VARIABLE SPEED ONLY)

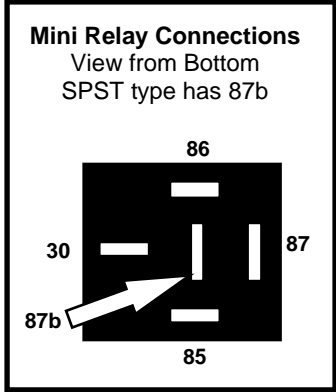


HAYDEN 3653



MAIN RELAYS TURN ON FANS WHEN TEMP SWITCH IS ACTIVATED

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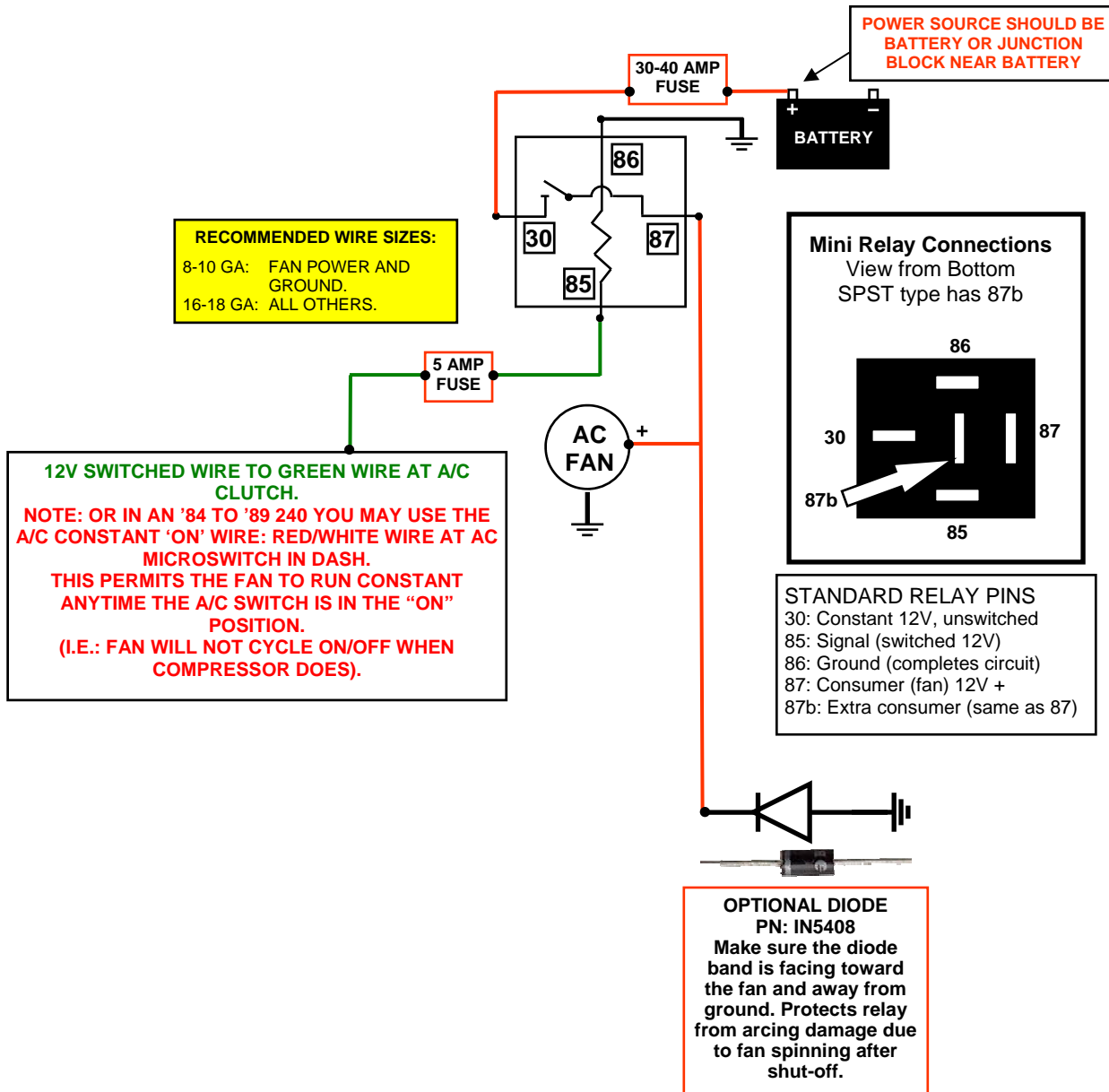


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SINGLE A/C FAN ONLY - Single Speed (ON/OFF)

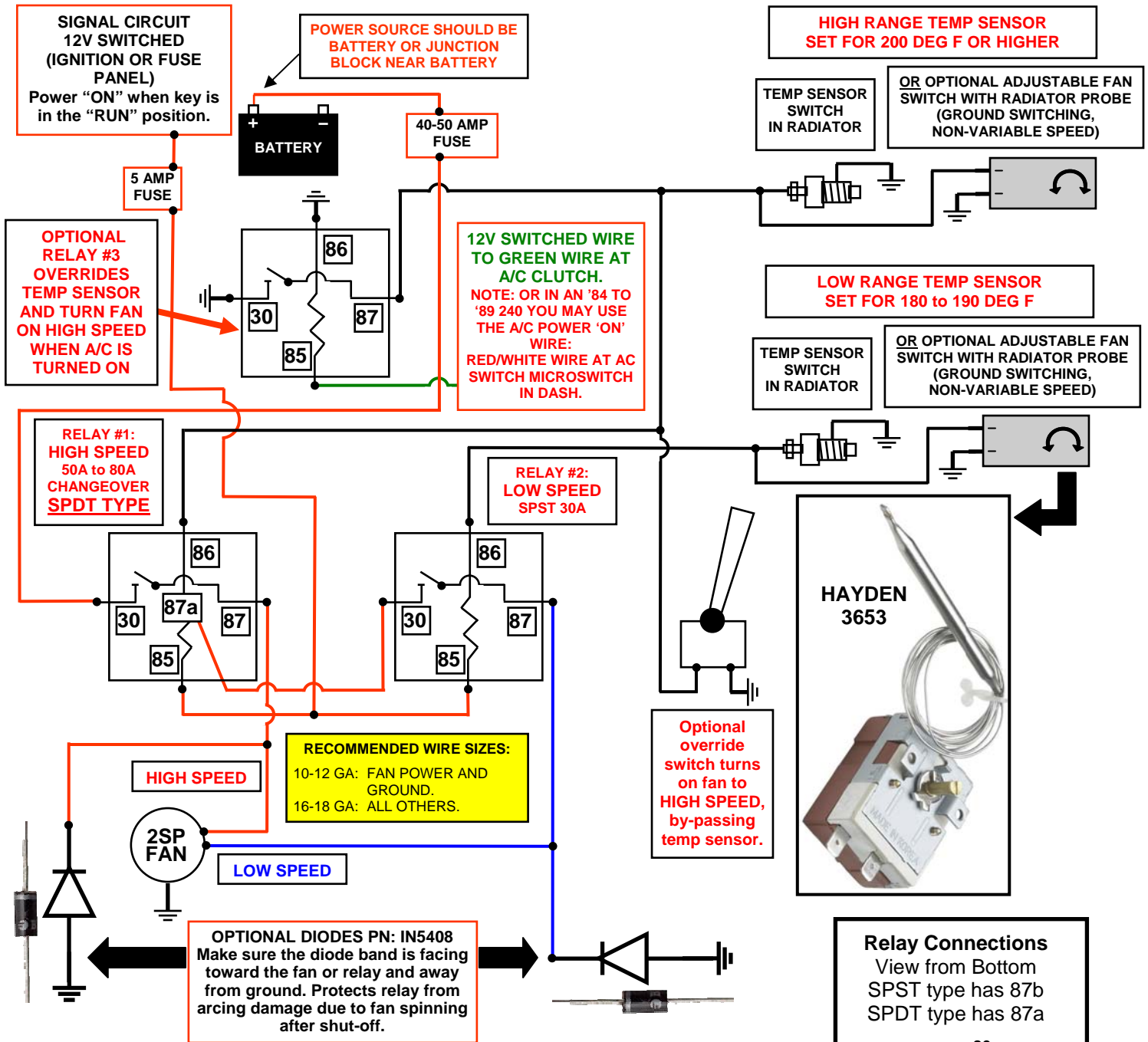
Adding a Pusher Fan for A/C Condenser

This diagram works well if you only wish to add a single fan to the front of your A/C condenser. It will not come on at a particular temperature, but only when the A/C is turned on.



Primary Cooling Fan - Two Speed Type (ON/OFF)

Using Ground Switched Devices Only for Primary Activation



TWO SPEED FAN CIRCUITRY SIMPLIFIED

This is not as confusing as it looks. A two-speed fan may be used as long as you use TWO relays and TWO temperature sensors set for different set points.

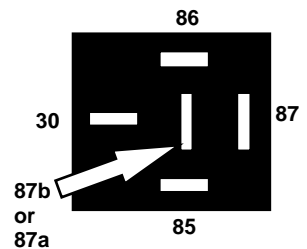
The fan will remain off until your low temp set point is reached, activating the low speed relay through 87a on the high speed changeover relay. If your temperature climbs higher, the second sensor high set point will activate the changeover relay, cutting power to 87a and sending power through 87 to the high speed fan. This way you can be sure only one circuit will be on at a time.

The high speed relay capacity will depend on the fan. Most 16 inch or smaller fans can get by with a 40A to 50A relay for the high speed. A larger fan, such as the 18 inch Ford Taurus/T-Bird/ Lincoln Mk VIII fans, should use a 70A or 80A relay. These fans generally use ~40 amps on high, so power and ground cables for these big fans should be 8-10 GA.

Simple mechanical radiator coolant sensors may be used as long as they are set for different temperature ranges. Or simple electric adjustable sensors, such as the Hayden 3653 pictured above right, can be purchased from Amazon or Summit Racing for about \$20 each.

Relay Connections

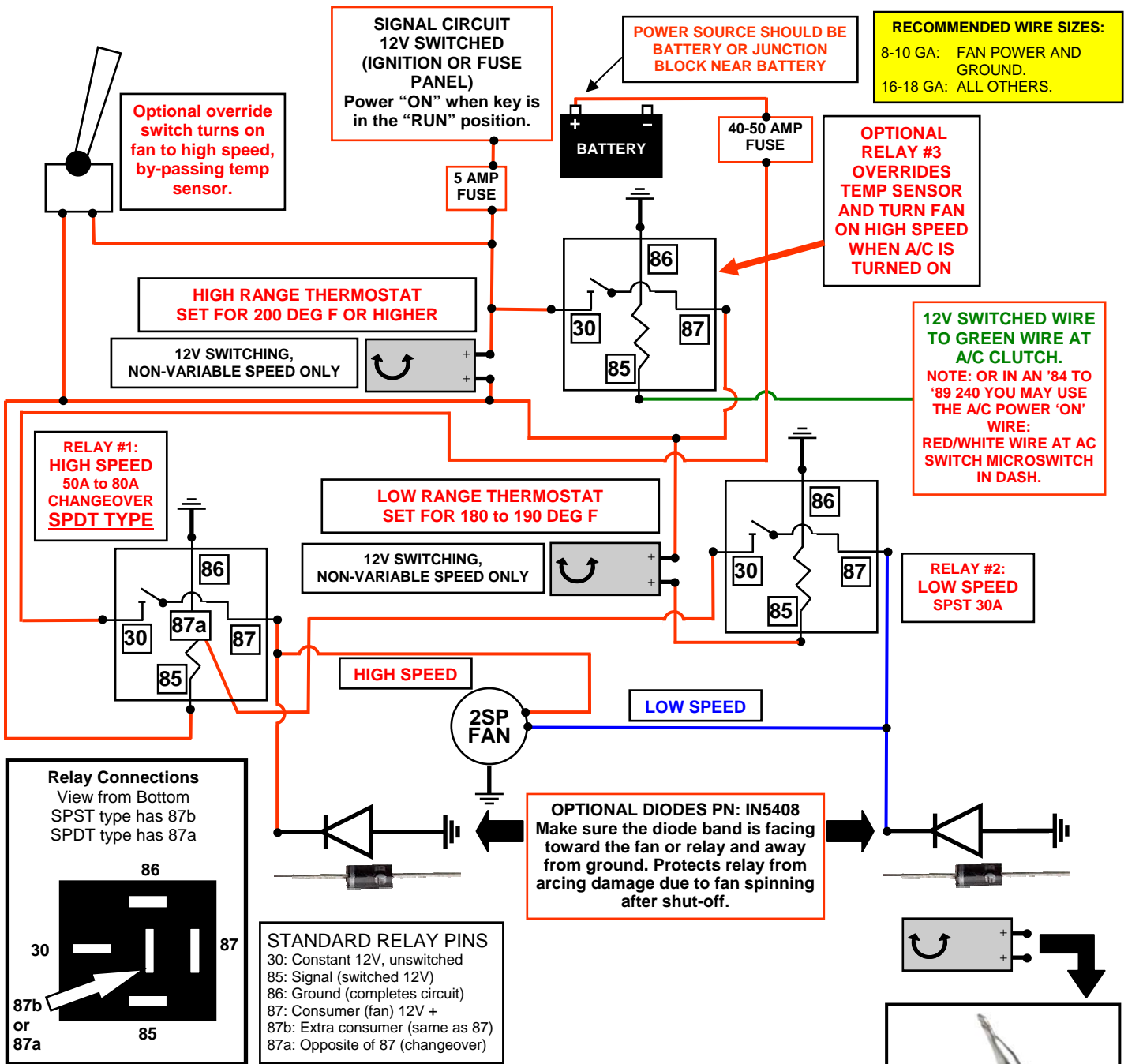
View from Bottom
SPST type has 87b
SPDT type has 87a



STANDARD RELAY PINS
30: Constant 12V, unswitched
85: Signal (switched 12V)
86: Ground (completes circuit)
87: Consumer (fan) 12V +
87b: Extra consumer (same as 87)
87a: Opposite of 87 (changeover)

Primary Cooling Fan - Two Speed Type (ON/OFF)

Using 12 Volt Switching Devices Only for Primary Activation



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