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## HPC Radiator Fan Control Module with Sensor

PN: 102001



The HPC Radiator Fan Controller provides automatic control over one or more electric radiator fan(s). The module uses a temperature sensor installed in the engines cooling system to determine when to energize relays to turn on the fan(s). The temperature setting is easily adjustable by rotation of a potentiometer located inside the module. In addition, the module also has a remote override wire which may be connected to an existing air conditioning system or an override toggle switch to turn on the fan(s).

### Features

- More reliable than temperature switches or radiator probe systems
- Adjustable temperature range from 140-220°F (60-105°C)
- Easy to integrate with factory and aftermarket A/C systems
- OE style sensor and weatherproof connectors
- Failsafe design runs fan(s) if sensor circuit fails

This manual covers the *102001* Fan control module supplied with sensor & pigtails, adjustable temperature. The customer must supply all additional wire, fuses, fuse holders, relays, terminals, connectors and hardware. For kits including all these components see the *102002-102007* series which include wiring harnesses as a complete kit for a variety of fan configurations at [www.hpcontrols.ca](http://www.hpcontrols.ca). For custom built wiring harnesses, contact [sales@hpcontrols.ca](mailto:sales@hpcontrols.ca) with your requirements.

### Other Kits from HPC with Complete Wiring Harnesses

<b>102002</b>	For single radiator fans	<b>30 AMP</b>
<b>102003</b>	For two radiator fans that turn on and off at the same time	<b>2 x 30 AMP</b>
<b>102004</b>	For two radiator fans with staggered activation	<b>2 x 30 AMP</b>
<b>102005</b>	For two radiator fans with low and high speed operation	<b>2 x 30 AMP</b>
<b>102006</b>	For single radiator fans	<b>60 AMP</b>
<b>102007</b>	For single fan with two speed operation (Ford MK VIII fan)	<b>50 AMP</b>

## What's Included

### 102001 Kit Contents



HPC offers a series of temperature sensors all compatible with the HPC fan control module.

### Optional Sensors - (Sold separately)



HPC offers replacement parts for all of the fan control kits. Visit our website or contact us for other parts.

### Optional Parts (Sold Separately)



## Important Notes

Installation should only be attempted by someone who is completely comfortable with automotive wiring and general cooling system operation. Professional installation is highly recommended.

Failure to properly follow the instructions in this manual could result in personal injury or may damage the vehicle, either electrically or mechanically. If you are uncomfortable, have a professional install it for you.

This kit **REQUIRES** a spare 3/8" NPT port on the engine cylinder head or intake manifold that enters the water jacket for the coolant temperature sensor to be mounted. Often engines will have a spare port for bleeding air from the system. This kit does not make use of the radiator fin probe type sensor as these sensors may cause damage to the radiator, are more likely to succumb to damage and less accurate. The sensor included in the kit is a factory style temperature sensor that provides better accuracy and longevity. If no spare port is free this kit will **NOT** be able to be installed in the vehicle. See optional sensors above for other temperature sensor options. See the installation instructions for more information.

It is strongly recommended to have a coolant temperature gauge or at minimum a functioning temperature warning lamp. Failure to properly install, test and monitor for correct operation of your cooling system could result in severe engine damage. Watch your gauges.

Harris Performance Controls accepts no liability for injury, damages or otherwise caused by or related to the installation and use of its products.

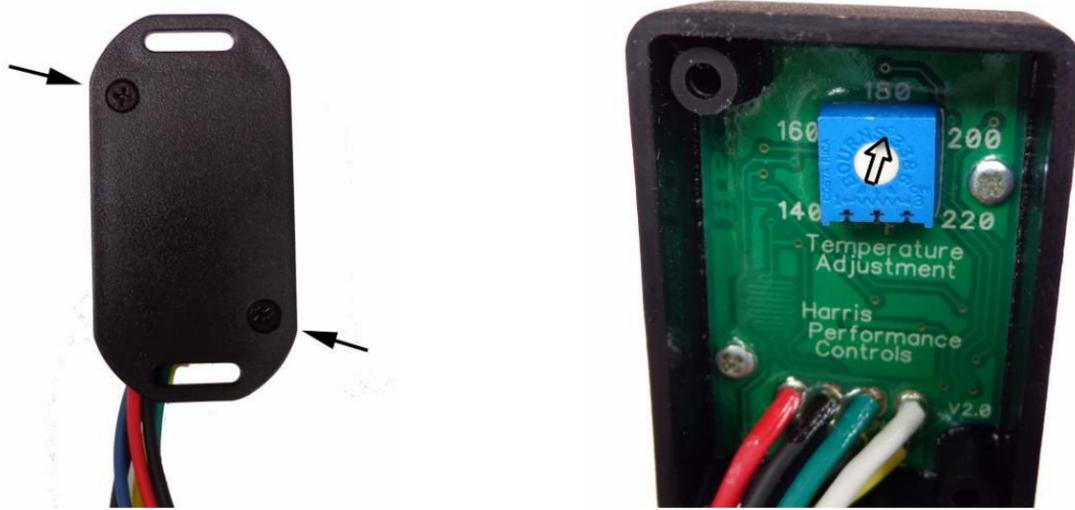
The use of after market electronic devices will void most new vehicle manufacture warranties. If your vehicle is still under warranty, please contact the warranty provider to determine whether the use of this device is compliant with their warranty terms.

Please ensure all parts of the particular kit you have ordered have been included. A list of included components can be found in the 'What's Included' section above.

Read the entire contents of this manual before proceeding with installation. If anything is unclear, contact Harris Performance Controls at [support@hpcontrols.ca](mailto:support@hpcontrols.ca) for clarification.

## Temperature Setting and Operation

The fan control module temperature is adjustable from 140°F to 220°F. To set the temperature, remove the two Phillips screws from the back side of the module. The potentiometer within can be easily turned with a small screwdriver to the desired temperature (pointer exaggerated for clarity).



The temperature setting is the temperature that the low speed fan will engage at. The fan will turn off when the temperature drops 10°F below the set point. The secondary fan (if equipped) will engage at 10°F over the set point, turning off once the temperature drops back to the set point. Generally speaking, if the sensor is installed in the engine the temperature setting should be at least 10°F over the thermostat temperature to ensure the fan does not run continuously. If the sensor is installed in the radiator the setting may be lower.

When using two speed fans, these are the low and high speed settings.

	ON	OFF
FAN 1	Set Temp	Set Temp – 10°F
FAN 2	Set Temp + 10°F	Set Temp

The remote input wire (blue wire) will engage the fans when it is grounded. If the wire is connected directly to ground, either through an override switch or A/C system, the system will run all fans at full speed.

## Installation Instructions

**Ensure you have the correct tools for the job. Read the instructions completely before starting to ensure you are properly equipped for the job. Disconnect the battery before beginning.**

Ensure you have enough wire to reach to your coolant temperature sensor, fan(s), battery and the location that you will mount the relays and control module before proceeding.

**1. Set desired temperature on the control module.** Refer to temperature setting and operation information above.

**2. Install the temperature sensor.** Locate a free 3/8" NPT port in the cylinder head, intake manifold or radiator that enters the cooling system. The closer to the top of the engine or thermostat the better the reading will be. Install the sensor with thread sealer to avoid leaks.

If there is a plug in the location currently, remove it. If there is a plug of a larger size, you will need a reducer bushing to reduce the hole to 3/8" NPT. These can be obtained from HPC at [www.hpcontrols.ca](http://www.hpcontrols.ca) or most hardware or plumbing stores. It is recommended that brass reducers be used when possible. For a list of alternative sensors from HPC, see the optional accessories section above. Do not remove an existing sensor, as doing so will either disable a dash light/gauge or compromise the ECU's ability to correctly meter fuel and other functions.



### IMPORTANT

- If teeing into heater hoses for temperature sensor installation, it is important to ensure the sensor is not in the return side from the heater as the temperature will not be accurate. Additionally, do not install the sensor in heater hoses if the heater controls stop the flow of water to the heater with a valve.
- Do not install the sensor in the engine in a location that has stagnant coolant as this will affect the temperature sensor reading.

**3. Route wires to the coolant temperature sensor, battery, relays and fans.** Refer to the wiring diagrams in the end of this manual to determine how to wire your desired configuration. The suggested wire colors and wire gauges are listed in these diagrams.

The yellow and black wire harness should be routed from the control module to the temperature sensor. Tuck wires inside existing loom where possible for protection. Trim excess wire if desired.

The radiator fan supply wiring, relays and fuses should be determined by the fan manufactures recommendation.

As a general guide, use 12AWG wire with 30A fuses and relays or 10AWG wire with 50A fuses and relays.

Cover exposed wires with wire looming. Failure to do so may cause abrasion or damage from heat. Harnesses should not be in direct contact with a hot engine. Secure wires with wire ties so that they are away from sources of heat or abrasion.

**4. Make electrical connections.** Connect the components as per the wiring diagrams at the end of this manual. If crimping the connections, it is suggested the connections be covered with adhesive lined shrink tubing or similar. This will provide a waterproof connection. Ensure to use adequate crimping pressure if using this method. The wire connections may also be soldered and then covered with shrink tubing if desired. Plug in the temperature sensor now.

BLACK	Ground
RED	Switched 12V
WHITE	Low speed fan relay
GREEN	High speed fan relay
BLUE	Override switch circuit

**5. Mount the controller and relays.** Choose a location for the relay(s) and control module in the engine bay away from significant sources of heat. The ideal location is beside the battery on the inner fender. If using screws, ensure the area to drill is safe and does not have hidden harnesses or vapor canisters behind it. Alternatively, wire ties may be used to secure the components.



**6. Connect the blue remote turn on wire (Optional).** This wire may be connected to the grounding side of a ground triggered air conditioner relay or extended into the cabin to act as a manual override. If being used as a manual override, wire the other side of the switch to a ground so as to short the wire to ground. See wiring diagram at the end of the manual. Otherwise, leave the wire disconnected for normal operation.

If more than one trigger source is desired, a trigger expander may be purchased separately from HPC, see optional accessories above. This allows for two isolated trigger sources such as A/C and toggle switch, and additionally allows for a low speed trigger, applicable when running two fans.

Now all the electrical connections should be complete and all equipment installed. Verify all connections are secure and correct, and that there are no leaks from the temperature sensor. Install the relay(s) and fuse(s) now if not already done. Reconnect the vehicle battery.

### Test for correct operation

Re-connect the battery and start the vehicle. To verify fan(s) are functioning, unplug the temperature sensor. The fan(s) should now be running at full speed. Plug the sensor back in, the fan(s) should stop.

Watch the temperature gauge as the engine warms up. Once it reaches the fan turn-on temperature, ensure the fan does cycle and that the engine cools down and the fan shuts off. Remember, there will be some variance between a vehicles temperature gauge when the fans start due to sensor placement and the sensors themselves.

**If the fan(s) do not start, shut off the engine - do not allow it to overheat!**

Refer to the troubleshooting section below.

### Troubleshooting

The fan control module is programmed to fail-safe if the temperature sensor is either disconnected, shorted or reads outside the normal range. In this scenario, the fans will run at full speed.

No green light on module.

- No ignition power. Check circuit fuse and confirm power with test light.
- Bad ground.

Blue light on module flashing.

- Temperature sensor circuit shorted to ground, 12v or disconnected.
- Faulty temperature sensor. Check resistance against chart to right.

Fan does not come on, blue light on module lit.

- Check power to fuses and to relays. Repair broken wires or bad connections.
- Bad relay contacts. Replace relay.
- Bad fan motor.

Fan does not come on, blue light on module not lit.

- Incorrect temperature setting, try lowering 10°F and retest.
- Coolant sensor in air pocket or incorrectly installed.

Fan comes on at correct temp, and does not shut off.

- Temperature set too low. Turn off temp must be above thermostat temp.
- Undersized cooling fan.
- Stuck thermostat or other cooling system limitation.

Fan stays on always with ignition off.

- Check that green light on module turns off. If not, connect power feed to a switched ignition circuit.
- Relay contact welded shut. Replace relay.

Fan stays on always when ignition on.

- Remote turn on wire grounded, disconnect blue wire and recheck.
- If blue light flashing, see above.

Fuse supplying fan blows immediately.

- Damaged wiring.
- Bad/Shorted fan motor.

Fuse supplying fan blows after some time.

- Worn out fan motor drawing too much current.
- Oversized fan for this kit.

If the above fail to resolve the issue, it may be due to a failed control module or another problem.

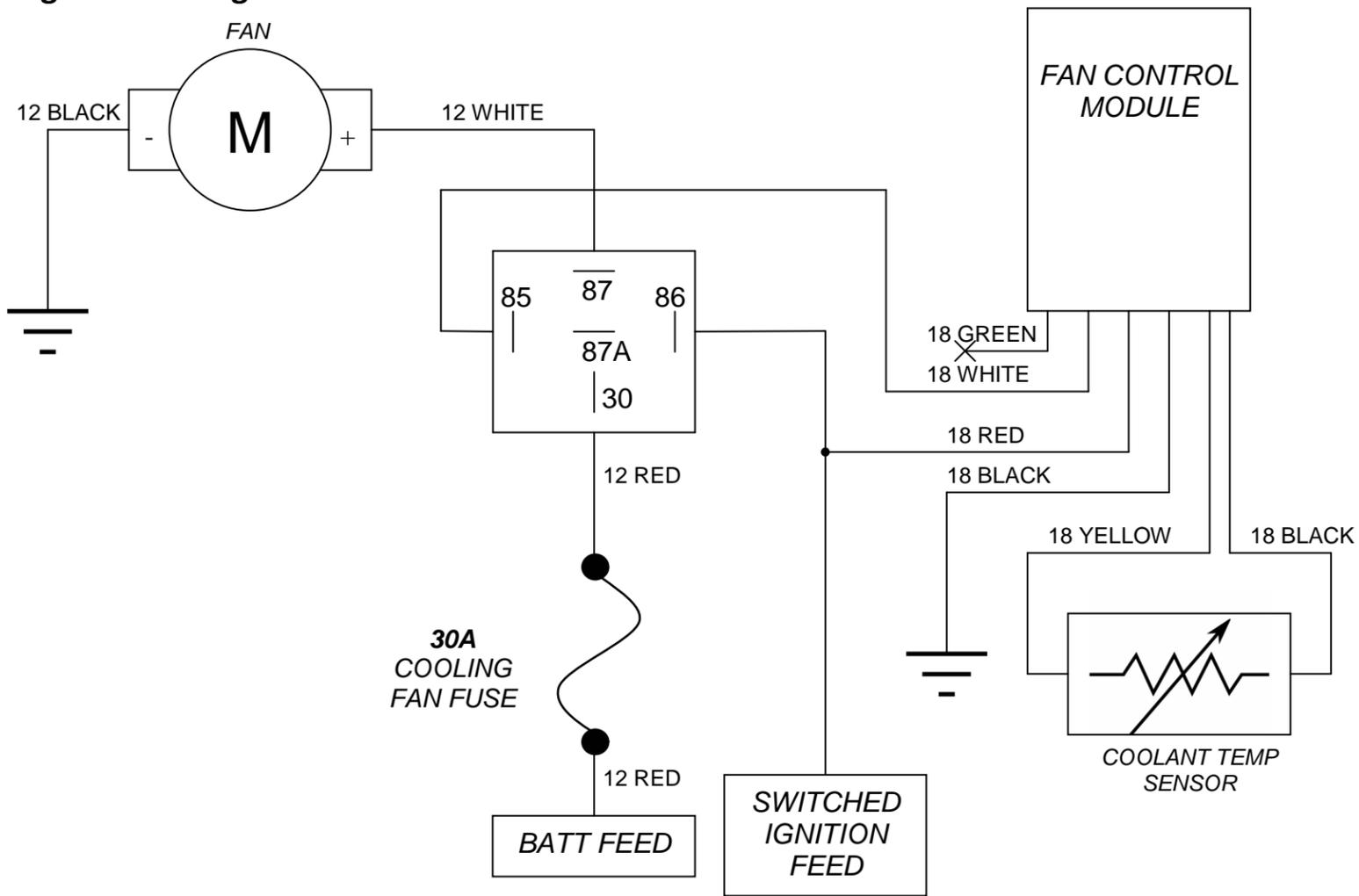
Please contact [support@hpcontrols.ca](mailto:support@hpcontrols.ca) for assistance.

Temperature sensor

Temperature vs. Resistance		
20°F	-7°C	11k-15k Ω
60°F	16°C	3.9k-4.5k Ω
100°F	38°C	1.5k-1.7k Ω
140°F	60°C	650-730 Ω
180°F	83°C	302-334 Ω
220°F	105°C	159-172 Ω

## Wiring Diagrams

### Single Fan Configuration

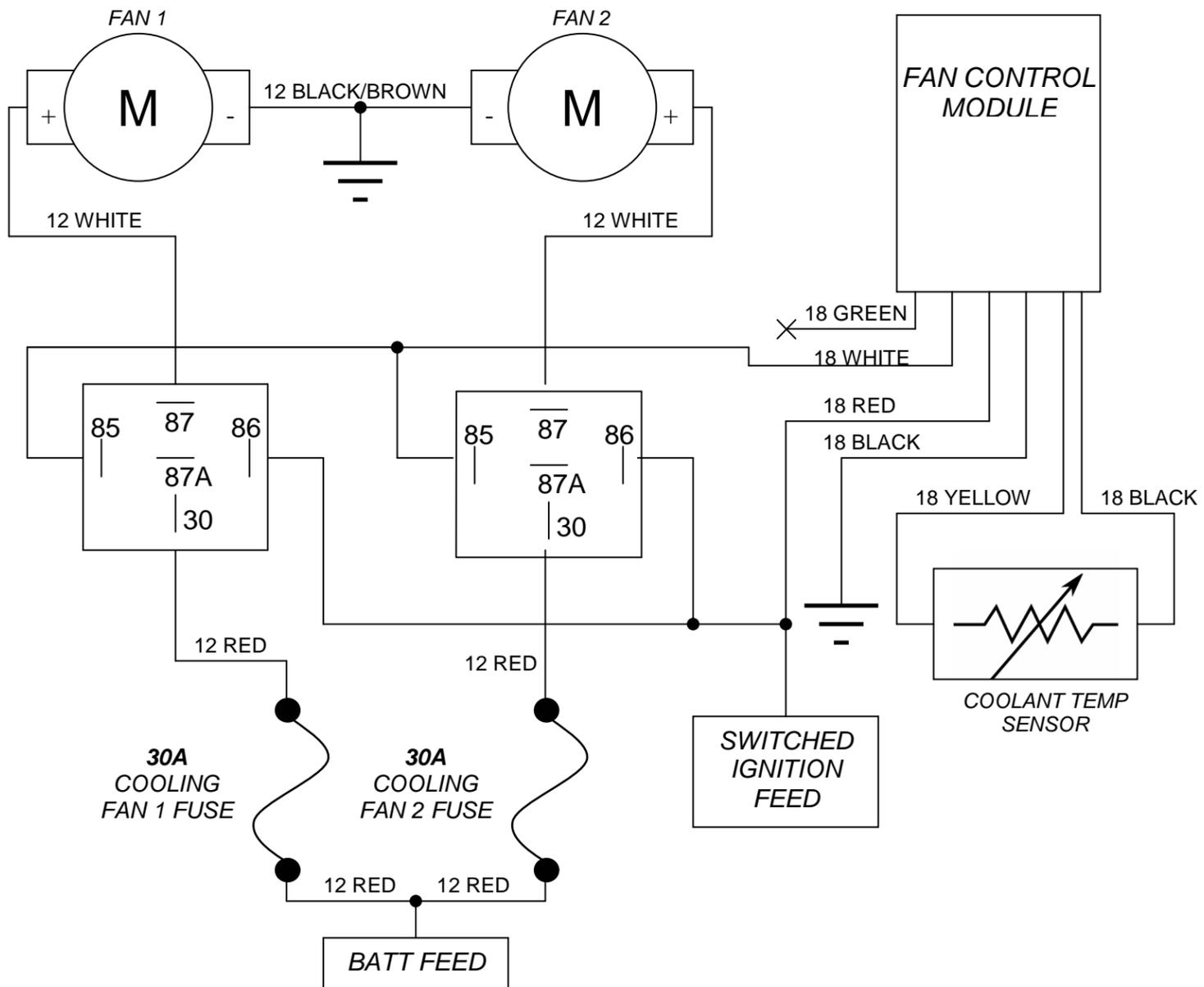


In this configuration, the one fan is run at the lower of the fan on/off points.

**NOTE** If using a high power fan, substitute 12AWG wire for 10AWG wire and fuse at 50A or 60A.

### Simple Dual Fan Configuration

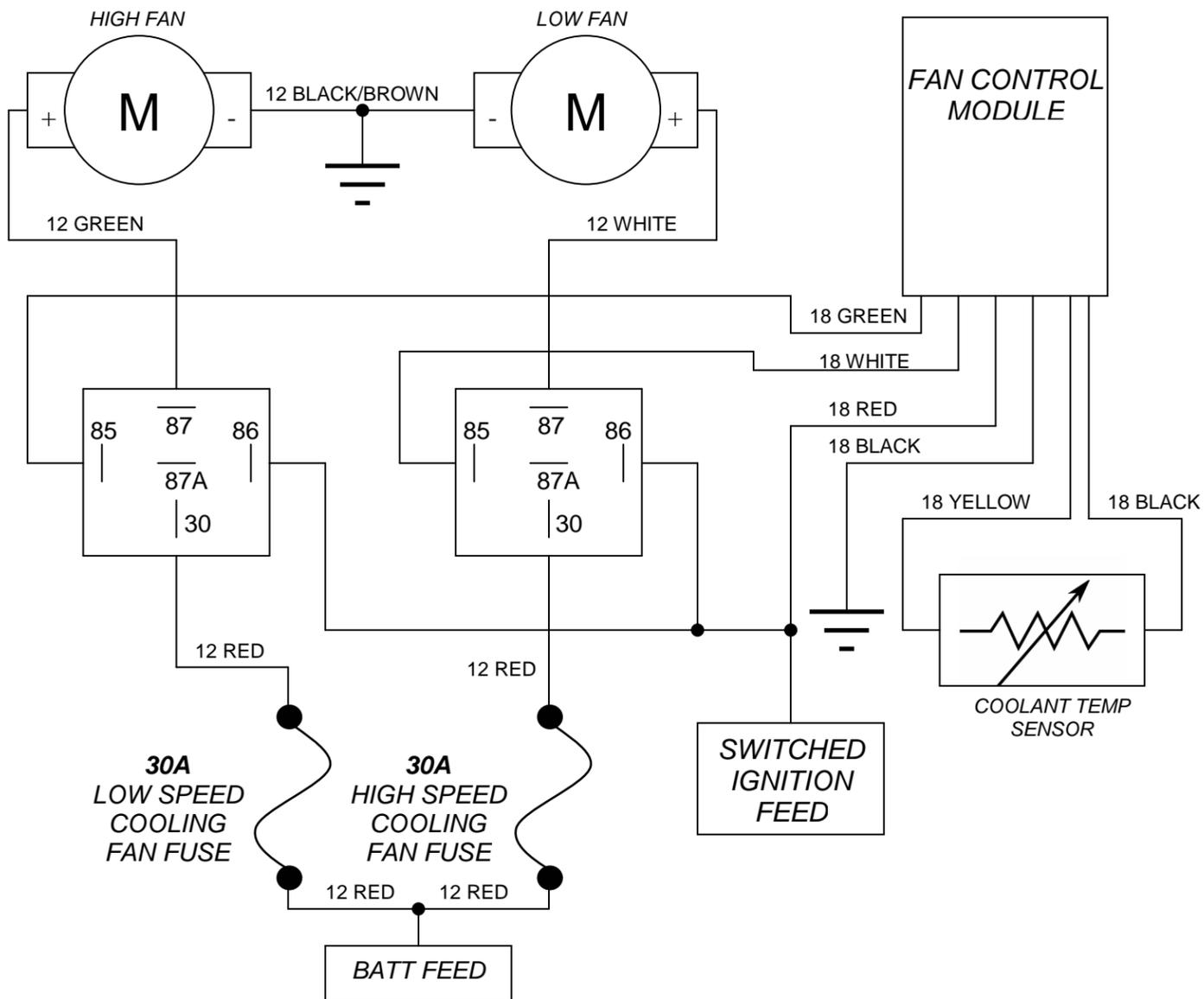
Both fans run at same time.



In this configuration, two fans are connected, but operate on the same control signal from the fan control module. This means they both turn on and off at the same time.

## Dual Fan Configuration – Sequential

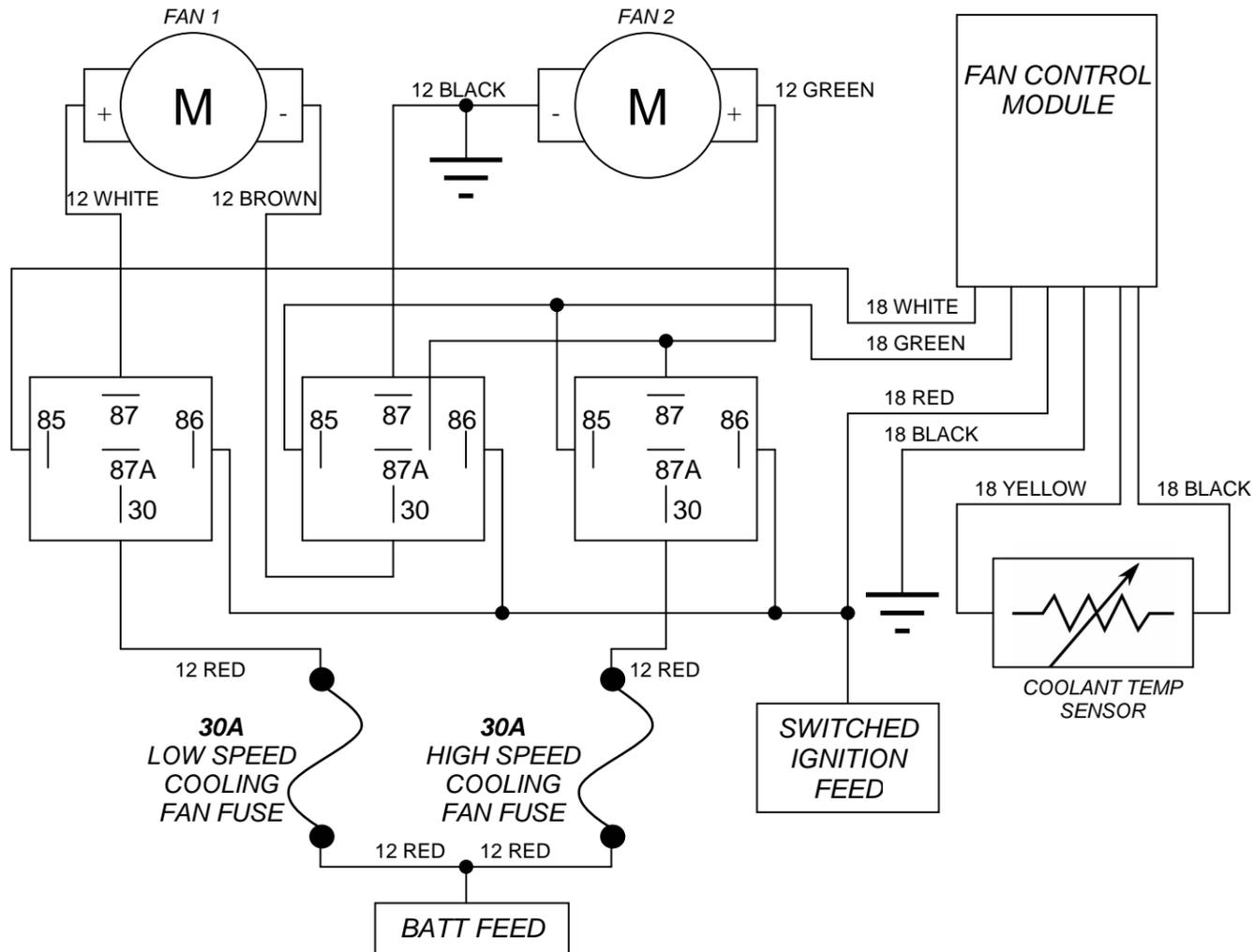
One runs at lower temperature, the second turns on at higher temperatures.



In this configuration the low fan turns on at lower temperatures, joined by the higher fan at higher engine temperatures. It is suggested that the fan shroud either have a divider between the fans, or that the fans have their own fan shrouds so that efficiency is not compromised.

## Dual Fan Configuration – Two Speed Control

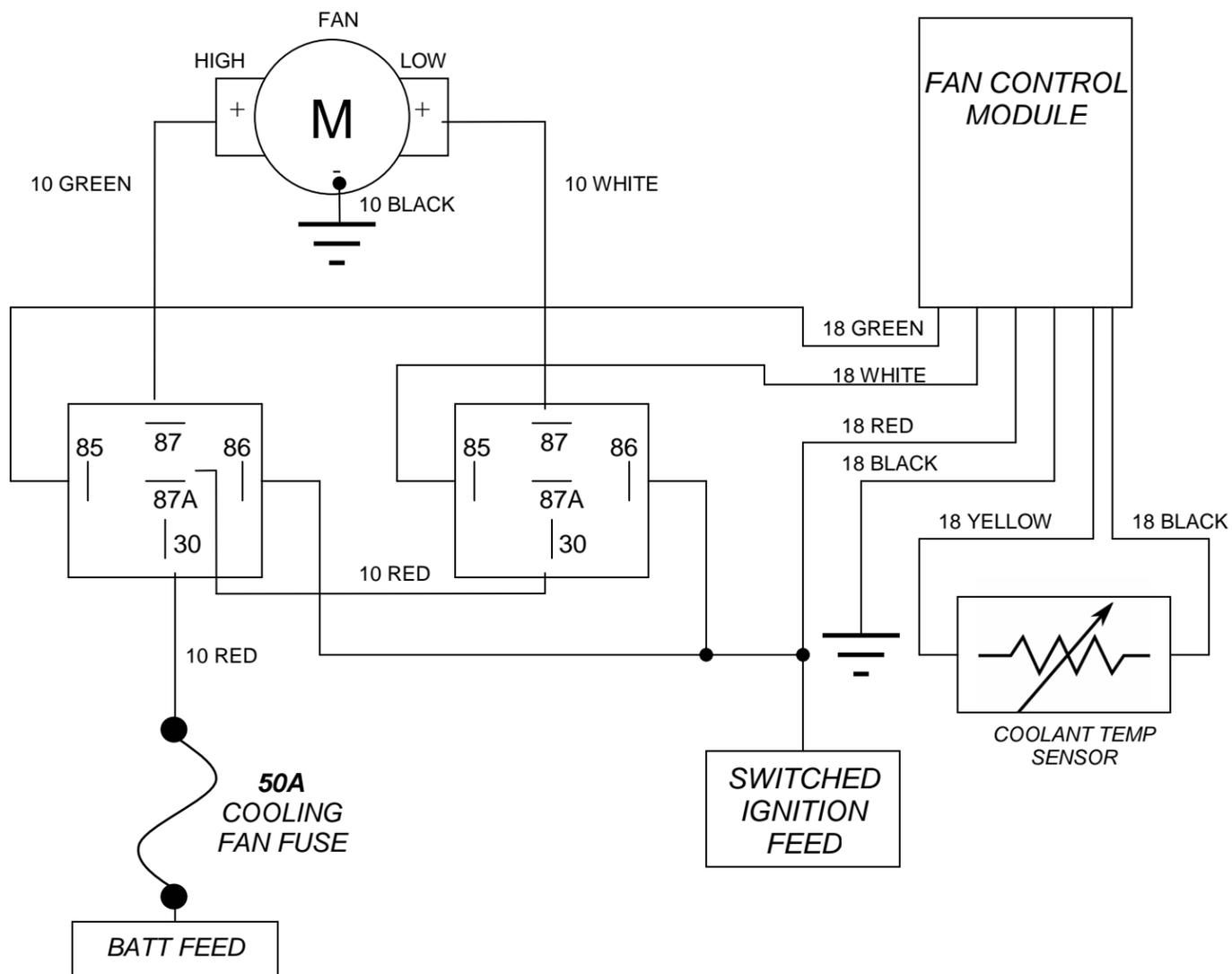
Both fans run at low speed (series) at low temp, high speed (parallel) at high temp.



This configuration is the preferred method of fan control for systems with two radiator fans. It allows both fans to be connected in series at lower temperatures and parallel at higher temperatures. This allows the fans to run at a lower speed and consequently operate far quieter. The other benefit of this setup is that at low speed, the fans will be drawing only half of the normal load of a single fan. Three relays are required to accomplish this series/parallel switching, however only two fuses are required.

## Single Two Speed Fan "Ford MK VIII" Style

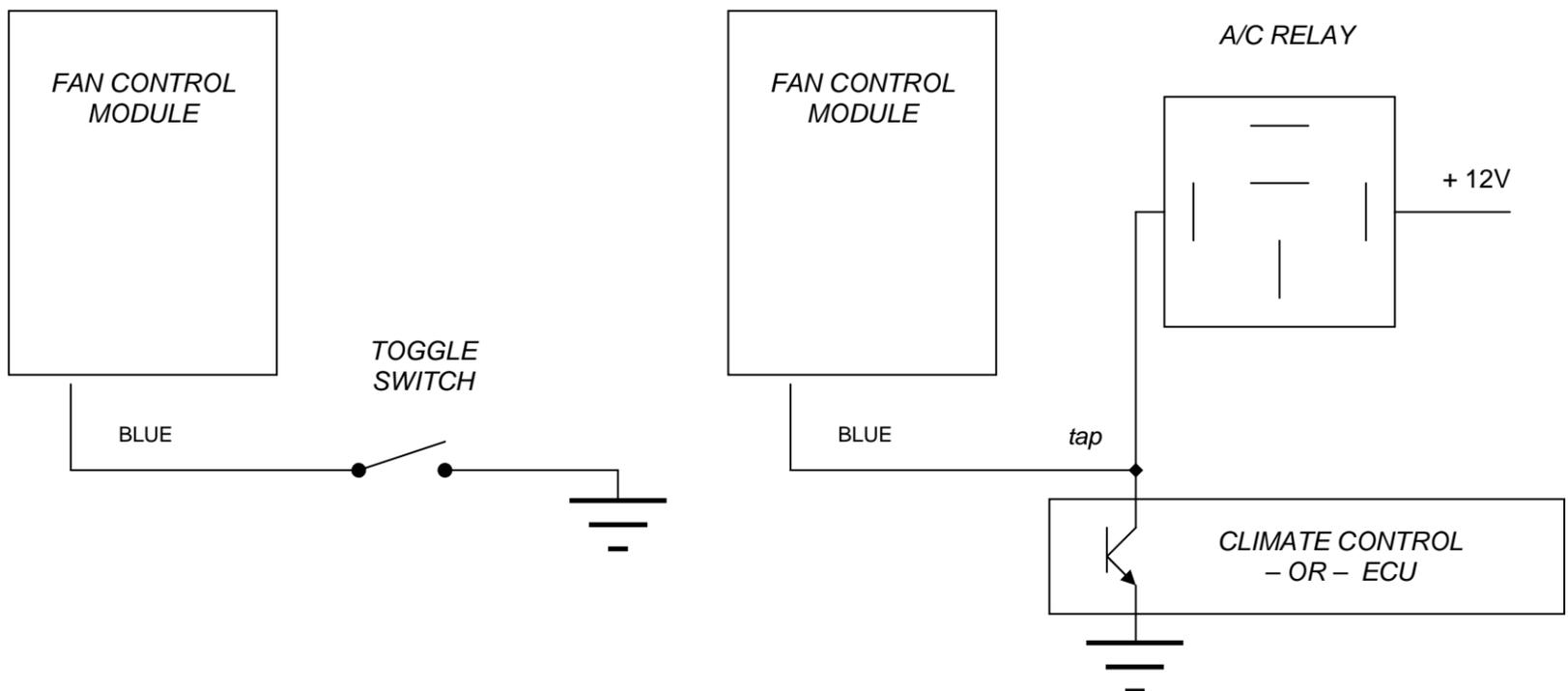
One fan with two separate internal motor windings for low or high speed



This configuration will activate the low speed input of the fan at lower temperatures, and switches over to the high speed circuit at higher temperatures. It does not allow both fan circuits to be powered at once. This has been specifically designed for Ford two speed fans commonly used for electric fan conversions. **NOTE** Some other two speed fans must have both low and high powered simultaneously, check your fan.

## Remote Turn-on Wire Hookup – Optional

The blue wire may be connected to a ground to turn on the fans.



If the vehicle has air conditioning, the fan(s) should run when the compressor is running to cool the condenser. To accomplish this, the blue wire from the fan control module may be connected to a switched ground signal from the A/C system. Most A/C compressor relays use a switched ground and may be tapped as indicated above. Otherwise, if desired, the blue wire may be used as an override to the fan control module and may be connected to a toggle switch in the vehicle which grounds the wire. If neither is desired, the wire may be left disconnected.

If more than one manual trigger source is desired, HPC part number 102010 may be purchased to allow for two high speed and one low speed isolated inputs. This allows the operator to have a low and high speed toggle switch to manually activate both speeds as well as retain an input from the A/C system simultaneously.

See the instructions for 102010 for more details.

## Warranty Information

Harris Performance Controls accepts no liability in the event of damage, injury, loss of use, or other burdens and perils due solely or in part to installation and use of its products.

At the sole discretion of HPC, units found to be faulty due to manufacturing error or defect will be warranted for replacement only for one year from the date of purchase. Units damaged by misuse, abuse or incorrect installation are not covered. The customer must contact HPC prior to submitting an item for a warranty claim. Product sent without proper approval will be denied and may not be returned. The customer is responsible for any shipping or handling fees when returning the product, CODs will be denied. The customer must provide proof of purchase date when contacting HPC if their purchase is not already on file with HPC. Warranty is for HPC supplied part only, warranty does not cover labor or related parts. For further clarification or to submit a claim for consideration, please contact [support@hpcontrols.ca](mailto:support@hpcontrols.ca)

**Please send us your feedback, comments & suggestions!**

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