
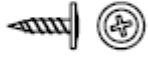




Fan Relay Harness High Output (FRH-HO-KIT)

This SPAL fan wiring harness is designed for high output fans (AP90 Series 12V Motors) which have higher current demands. It is compatible with all types of vehicles and can be installed on positive or negative ground vehicles with no modifications.



ACCESSORY ITEMS INCLUDED WITH HO-FRH-KIT:

| | |
|--|---|
| ○ | |
| AMP M6 RING TERMINAL 35349 (FULLY INSULATED) (2 PER KIT) | #8 x 1/2" WASHER PHILLIPS HEAD BLACK OXIDE COATED (4 PER KIT) |
|  |  |
|  |  |
| M6 LOCK TYPE WASHER (2 PER KIT) | M6 NUT ZINC-PLATED (2 PER KIT) |

Installing the Fan:

When installing electric cooling fans it is important to cover as much surface area as possible. Mount the fan as high up on the core as possible. Attach the fan to the small area around the core of the radiator where there is a metal lip that is approximately 1/4" to 3/8". This will allow mounting of the fan(s) without compromising the core of the radiator.

Installing the Temperature Switch (sold separately):

The sensor has a 3/8" pipe thread. The temperature switch is an OE type that is designed to mount in the cylinder head of the engine. However, any mounting in the water jacket is suitable. The 195TS temperature switch comes on at 195 degrees and off at 175 degrees. The 185TS switch comes on at 185 degrees and off at 165 degrees. If a different size adapter is needed, the correct size thread adapter can be found at most automotive parts or hardware stores (1/2" adapter is included with the kit). **Caution: Do not use Teflon tape** on the sensor as it can cause a poor electrical contact which can cause the switch to operate incorrectly.

Wiring:

Mount the relay in a secure place in the engine compartment away from heat sources. Once this is completed connect the wires as directed in the wiring diagram and notes below.

Red: Connect to positive battery terminal using supplied fuse holder.

Black: Connect to chassis ground.

Gray: Connect to temperature switch nut with supplied blue ring terminal.

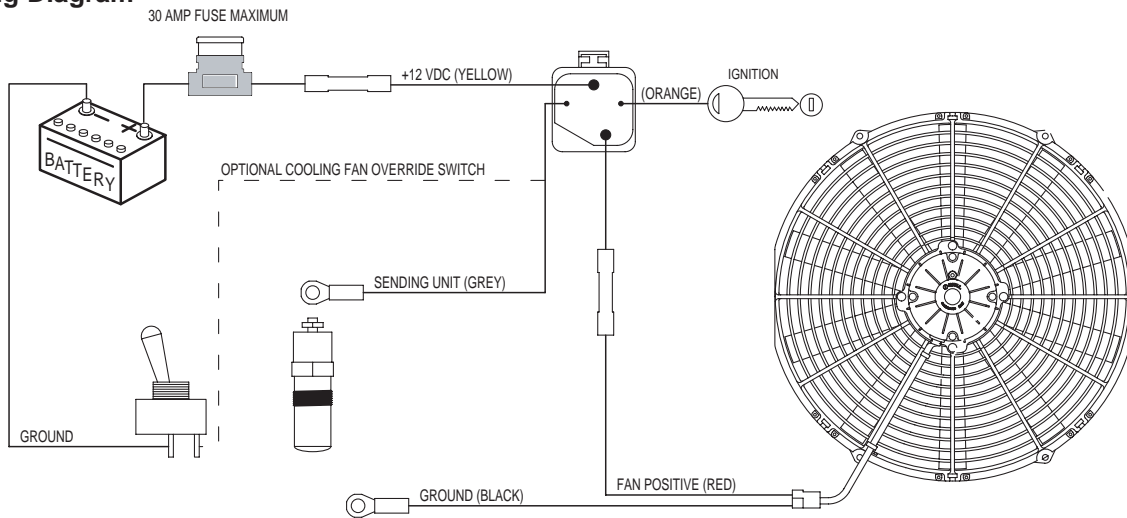
Orange: Connect to ignition switch +12 VDC when the engine is in the run position. (Hook to constant +12 VDC for the fan to run continuously when the engine is hot even when ignition switch is off.)

Plug connector into Relay

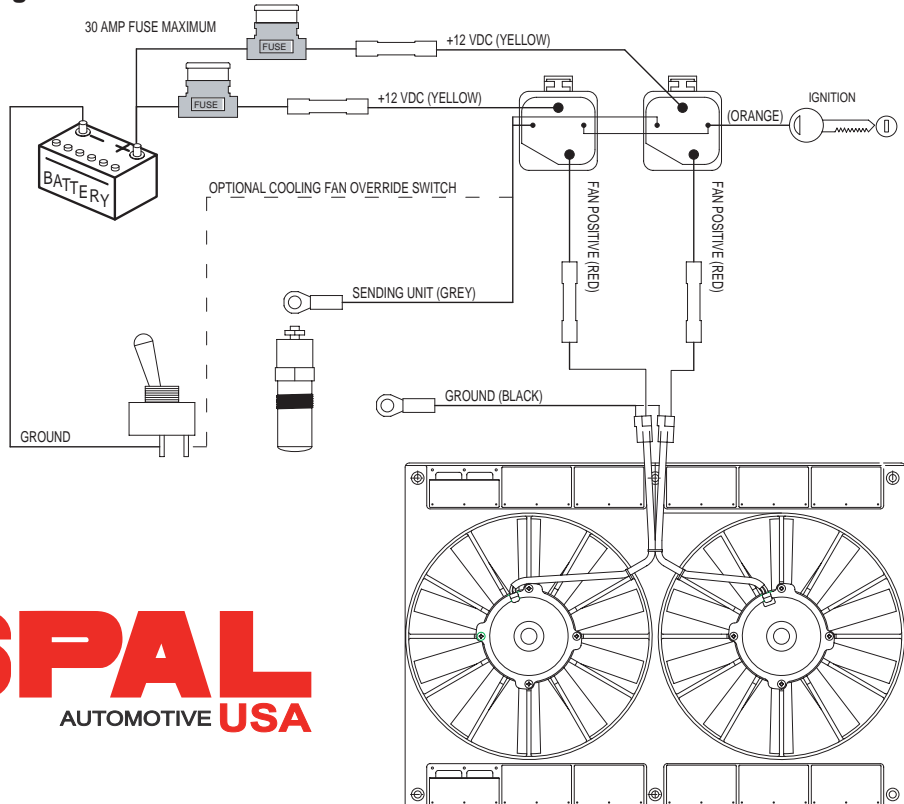
Connect the Red wires with the ring terminals on Relay and tighten bolts. These wires are interchangeable and can be placed on either terminal with only one ring terminal on each post.

| Problem | Cause(s) | Solution(s) |
|---|------------------------------------|---|
| Engine overheats at idle and low speeds | Poor air flow through radiator | Install electric fan or duct air into engine compartment. |
| | Poor engine ventilation | Install SPAL fan and make sure engine compartment can vent hot air. |
| | Insufficient radiator | Have the core cleaned or replaced with an appropriate size. |
| | Engine idle circuit too lean | Enrich idle circuit. |
| | Engine timing too advanced | Retard timing. |
| Engine overheats continuously | Poor radiator / engine combination | Install sufficient radiator. |
| | Defective or stuck thermostat | Install new thermostat. |


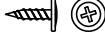


Single Fan Wiring Diagram



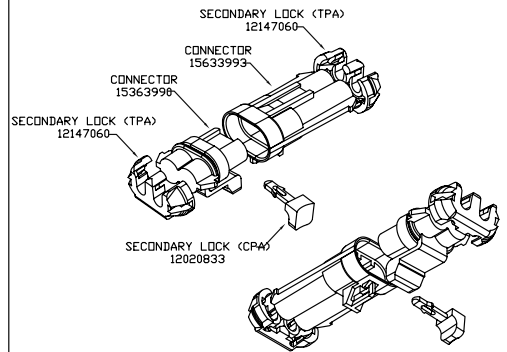
Multiple Fan Wiring Diagram



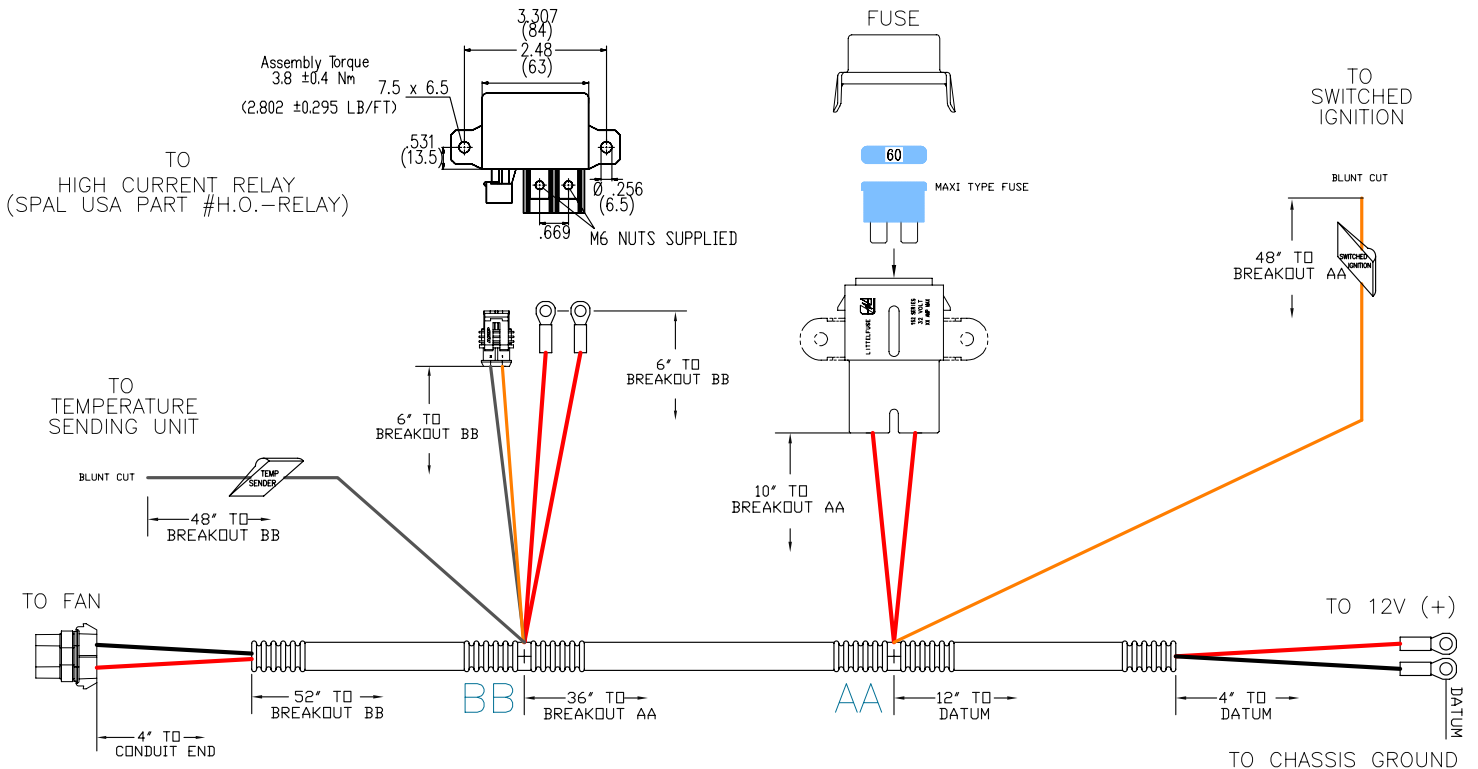
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ISOMETRIC (ENLARGED) VIEWS

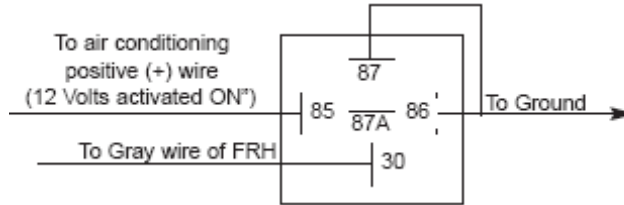


- NOTES:**
1. SECONDARY LOCK 12147060 (TPA) INSTALLED ON CONNECTOR 15363990 AS SHOWN UPON SUCCESSFUL INSERTION/INDEXING OF CORRESPONDING WIRES.
 2. OPTIONAL - SECONDARY LOCK 12020833 (CPA) INSERTED INTO LATCHING MECHANISM OF CONNECTOR 15363990 PRIOR TO SHIPPING. THIS CPA WILL BE REMOVED AT THE TIME OF INSTALLATION OF THE HARNESS IN APPLICATION. HARNESS CONNECTOR 15363990 IS MATED TO FAN CONNECTOR 15363993. THE CPA IS INSERTED INTO THE COMBINED LATCHED MECHANISM OF THE 2 CONNECTORS TOGETHER.



Air Conditioning Relay:

FRH required. From the A/C relay, connect the Yellow and Orange wires to Ground. Connect the Red wire to the temperature switch wire (Gray) on the FRH-HO harness. The Gray wire on the A/C relay goes to the +12 volt wire of the A/C compressor clutch. The fan will turn on when the A/C compressor activates.



Manual Over-Ride Switch:

A toggle switch (not provided) can be installed to manually over-ride the temperature switch. The switch will need to have a ground output and then connect it to the Gray wire.

General Information:

If the vehicle has overheating problems, there can be many causes. Step one is to determine what is causing the vehicle to overheat. The chart below provides several problem, cause and solutions to overheating.

| Problem | Cause(s) | Solution(s) |
|---|------------------------------------|---|
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| | Poor engine ventilation | Install SPAL fan and make sure engine compartment can vent hot air. |
| | Insufficient radiator | Have the core cleaned or replaced with an appropriate size. |
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