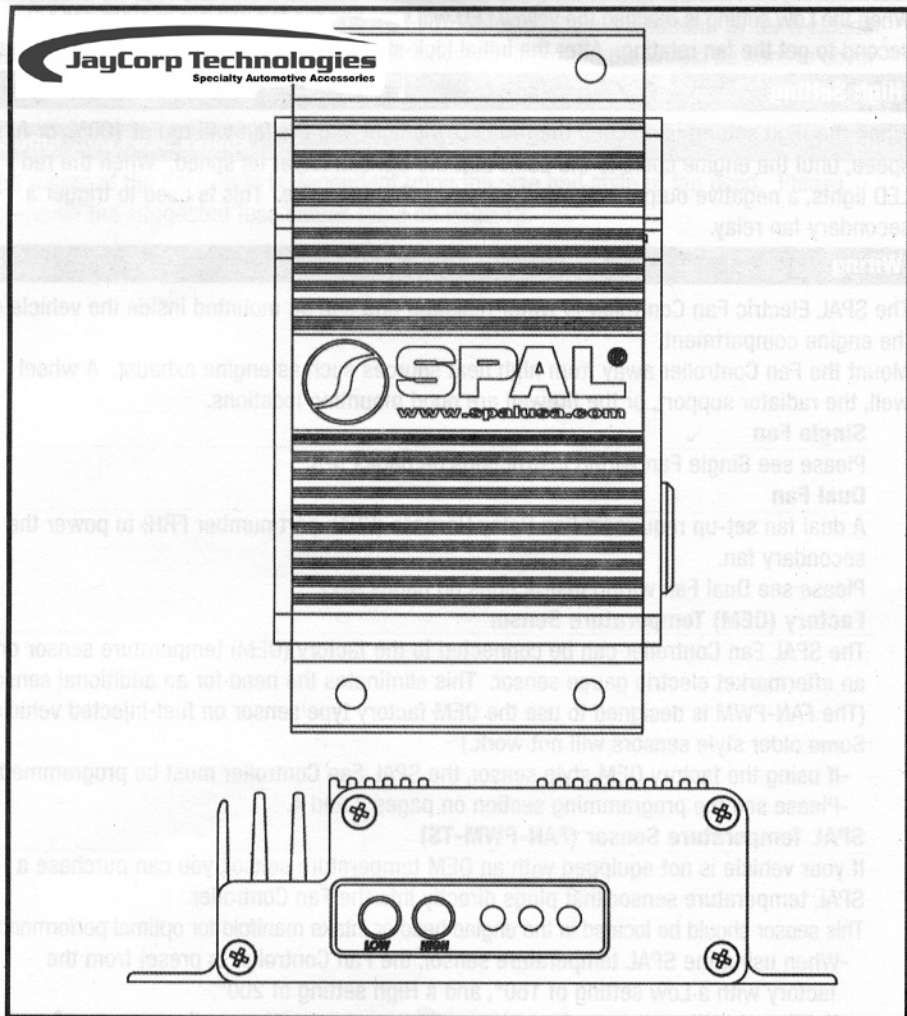


FAN-PWM

INSTALLATION INSTRUCTIONS



SPAL®
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Introduction / Overview

The SPAL Electric Fan Controller (FAN-PWM) will Pulse Width Modulate a single SPAL electric fan allowing the unit to vary the fan speed based on engine temperature. A second fan can be added with the use of an additional fan wiring kit (SPAL part number FRH). The second fan will not be PWM controlled; it will be ON/OFF only.

Low Setting

When the Low setting is reached the yellow LED will light and the fan will run at 100% for 1/2 second to get the fan rotating. After the initial kick-start, the fan will run at 50%, or 1/2 speed.

High Setting

When the High setting is reached the red LED will light and the fan will run at 100%, or full speed, until the engine cools to the point that the fan can lower its speed. When the red LED lights, a negative output will also be sent on the grey wire. This is used to trigger a secondary fan relay.

Wiring

The SPAL Electric Fan Controller is water resistant and can be mounted inside the vehicle or the engine compartment.

Mount the Fan Controller away from high heat sources such as engine exhaust. A wheel well, the radiator support, or the firewall are good mounting locations.

Single Fan

Please see Single Fan wiring instructions on pages 5-8.

Dual Fan

A dual fan set-up requires a Fan Relay Harness (SPAL part number FRH) to power the secondary fan.

Please see Dual Fan wiring instructions on pages 9-12.

Factory (OEM) Temperature Sensor

The SPAL Fan Controller can be connected to the factory (OEM) temperature sensor or an aftermarket electric gauge sensor. This eliminates the need for an additional sensor. (The FAN-PWM is designed to use the OEM factory type sensor on fuel-injected vehicles. Some older style sensors will not work.)

- If using the factory OEM style sensor, the SPAL Fan Controller must be programmed.

- Please see the programming section on pages 3 and 4.

SPAL Temperature Sensor (FAN-PWM-TS)

If your vehicle is not equipped with an OEM temperature sensor, you can purchase a SPAL temperature sensor that plugs directly into the Fan Controller.

This sensor should be located in the engine head or intake manifold for optimal performance.

- When using the SPAL temperature sensor, the Fan Controller is preset from the factory with a Low setting of 160°, and a High setting of 200°.

- If different settings are required, please see the programming section on pages 3 and 4.

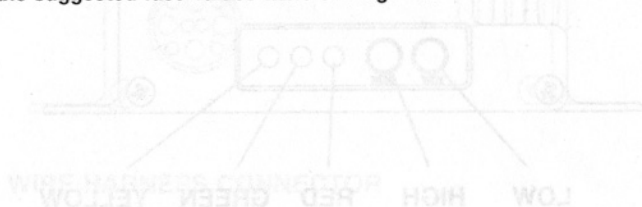
If you are using Air Conditioning you can connect the Blue wire to the 12V wire of the air conditioning compressor. When the compressor turns on, the fan(s) will run at 100% and the green LED will light.

Unused Wires

Depending on your specific system, you may have extra wires that are not being used. These wires can be coiled and contained in a non-conspicuous location. Or for a cleaner installation the unused wires may be cut. However, if cutting the wires, be sure to cover the ends of the wires with electrical tape or equivalent.

Suggested Fuse Values

The fusing of the FAN-PWM is dependent upon the size and style of fan used. Please reference the suggested fuse values table on Page 13.



- Start vehicle.
- All w engine to warm-up to desired "low" temperature or steady up.
- Once temperature has been reached, press and hold the "Low" button for 5-10 seconds to set the "low temperature".
- Yellow LED will light.
- When desired "high temperature" setting is reached, press and hold the "High" button for 5 seconds.
- Red LED will light.
- Programming is complete. Turn off ignition.
- Allow vehicle to cool.
- Plug in your fan (fan turned on) as an extra fan will maintain fan output.
- Start vehicle and confirm the fan runs on at the correct temperatures.

Programming Section

LED's:

Red: Indicates high temperature setting has been reached.

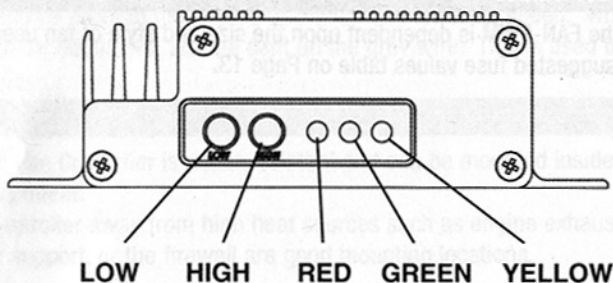
- Fan(s) run at full speed.

Yellow: Indicates low temperature setting has been reached.

- Fan starts at half-speed and increases until high temperature setting is reached.

Green: Indicates the Air Conditioning has been powered ON.

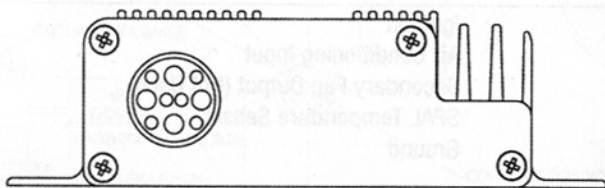
- Fan(s) run at full speed.



Programming

****The fan must remain unplugged during programming.****

- Unplug fan.
- Start vehicle.
- Allow engine to warm-up to desired "low" temperature.
- Once temperature has been reached, press and hold the "Low" button for 5 seconds to set the "low temperature."
- Yellow LED will light.
- When desired "high temperature" setting is reached, press and hold the "High" button for 5 seconds.
- Red LED will light.
- Programming is complete. Turn off ignition.
- Allow vehicle to cool.
- Plug in your fan.
- Start vehicle and confirm the fan turns on at the correct temperatures.



WIRE HARNESS CONNECTOR

Example

If you want your fan to spin at half-speed at 160 degrees, and spin at full-speed at 200 degrees, you would:

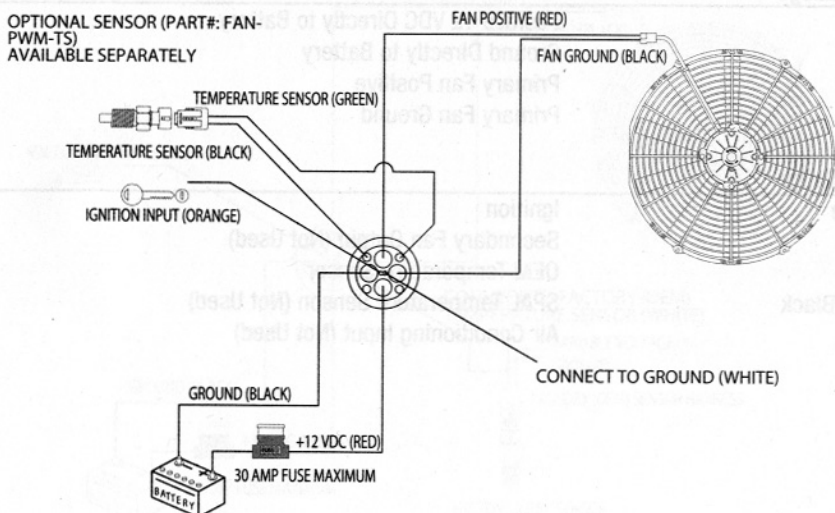
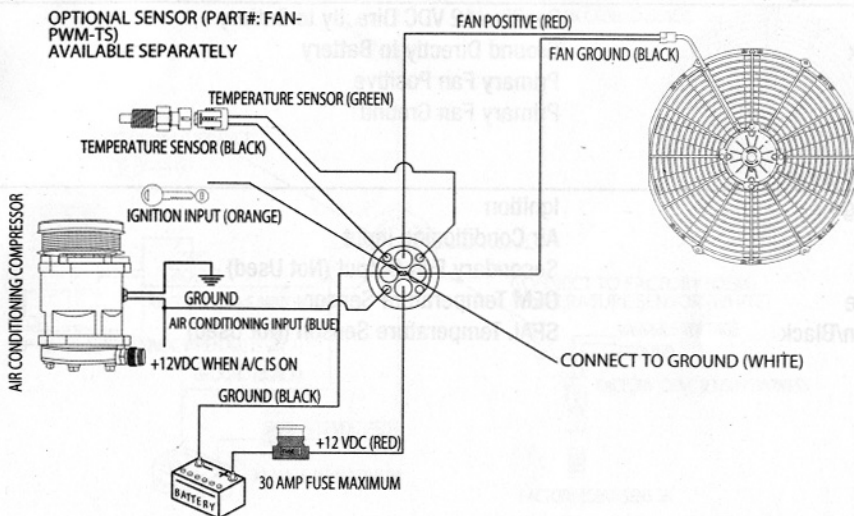
- Unplug fan.
- Warm-up vehicle to 160 degrees.
- Press and hold Low Button for 5 seconds.
- Yellow LED lights
- Continue to warm-up vehicle to 200 degrees.
- Press and hold High Button for 5 Seconds.
- Red LED lights
- Turn off the vehicle.
- Allow vehicle to cool.
- Plug in your fan.
- Start vehicle and confirm the fan turns on at the correct temperatures.

Single Fan - SPAL Sensor - with AC:

PWM Wire	Connects To:
Large Gauge	
Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground
Small Gauge	
Orange	Ignition
Blue	Air Conditioning Input
Grey	Secondary Fan Output (Not Used)
Green/Black	SPAL Temperature Sensor
White	Ground

Single Fan - SPAL Sensor - without AC:

PWM Wire	Connects To:
Large Gauge	
Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground
Small Gauge	
Orange	Ignition
Grey	Secondary Fan Output (Not Used)
Green/Black	SPAL Temperature Sensor
White	Ground
Blue	Air Conditioning Input (Not Used)



Single Fan - OEM Sensor - with AC:

PWM Wire

Connects To:

Large Gauge

Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground

Small Gauge

Orange	Ignition
Blue	Air Conditioning Input
Grey	Secondary Fan Output (Not Used)
White	OEM Temperature Sensor
Green/Black	SPAL Temperature Sensor (Not Used)

Single Fan - OEM Sensor - without AC:

PWM Wire

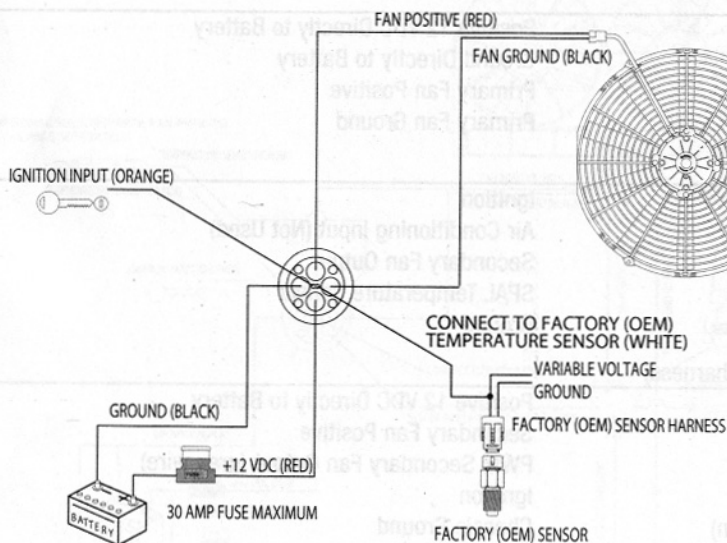
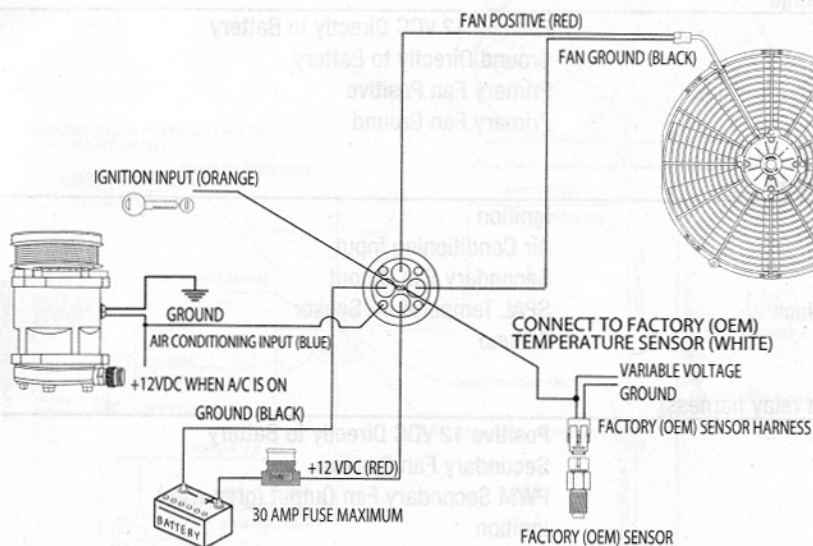
Connects To:

Large Gauge

Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground

Small Gauge

Orange	Ignition
Grey	Secondary Fan Output (Not Used)
White	OEM Temperature Sensor
Green/Black	SPAL Temperature Sensor (Not Used)
Blue	Air Conditioning Input (Not Used)

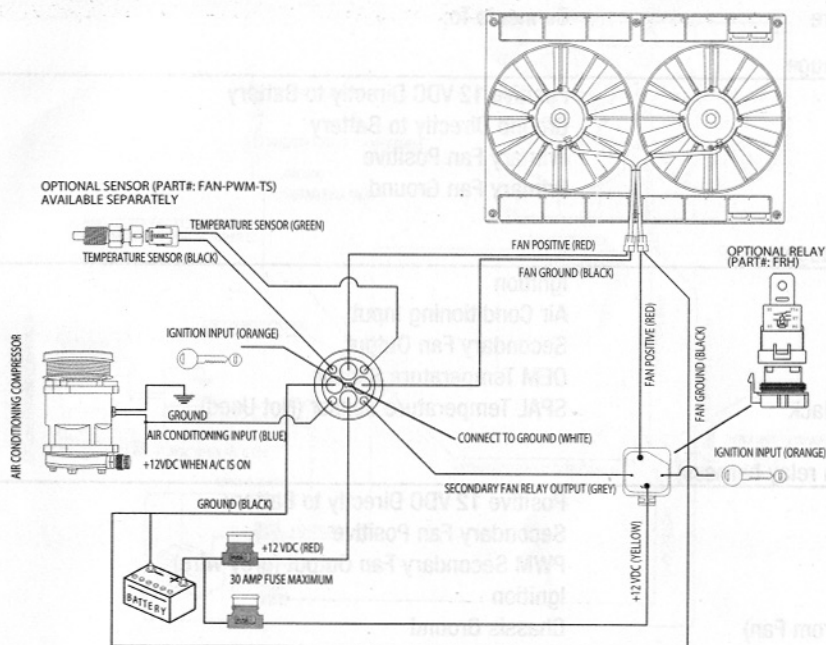


Dual Fan - SPAL Sensor - with AC:

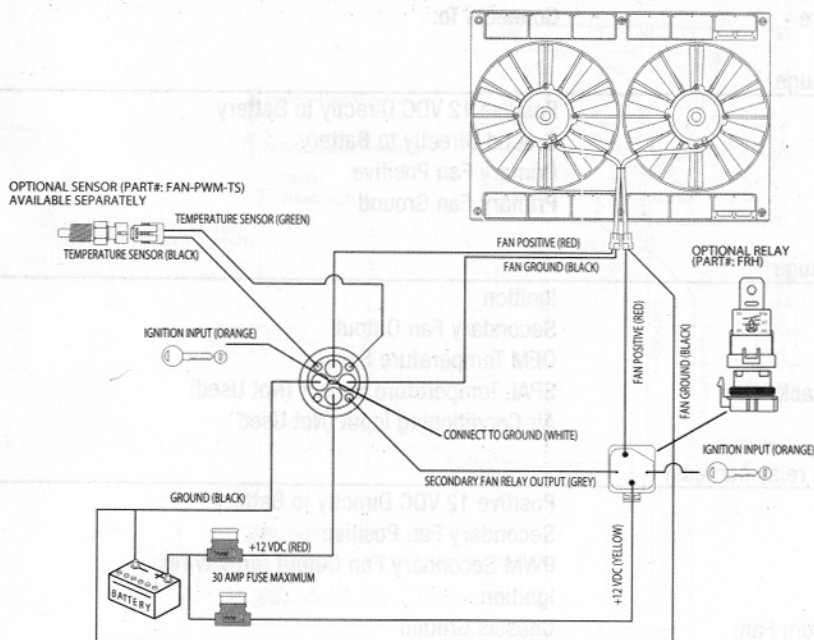
PWM Wire	Connects To:
Large Gauge	
Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground
Small Gauge	
Orange	Ignition
Blue	Air Conditioning Input
Grey	Secondary Fan Output
Green/Black	SPAL Temperature Sensor
White	Ground
FRH (fan relay harness)	
Yellow	Positive 12 VDC Directly to Battery
Red	Secondary Fan Positive
Grey	PWM Secondary Fan Output (grey wire)
Orange	Ignition
Black (From Fan)	Chassis Ground

Dual Fan - SPAL Sensor - without AC:

PWM Wire	Connects To:
Large Gauge	
Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground
Small Gauge	
Orange	Ignition
Blue	Air Conditioning Input (Not Used)
Grey	Secondary Fan Output
Green/Black	SPAL Temperature Sensor
White	Ground
FRH (fan relay harness)	
Yellow	Positive 12 VDC Directly to Battery
Red	Secondary Fan Positive
Grey	PWM Secondary Fan Output (grey wire)
Orange	Ignition
Black (from Fan)	Chassis Ground



FANS MUST BE FUSED SEPARATELY



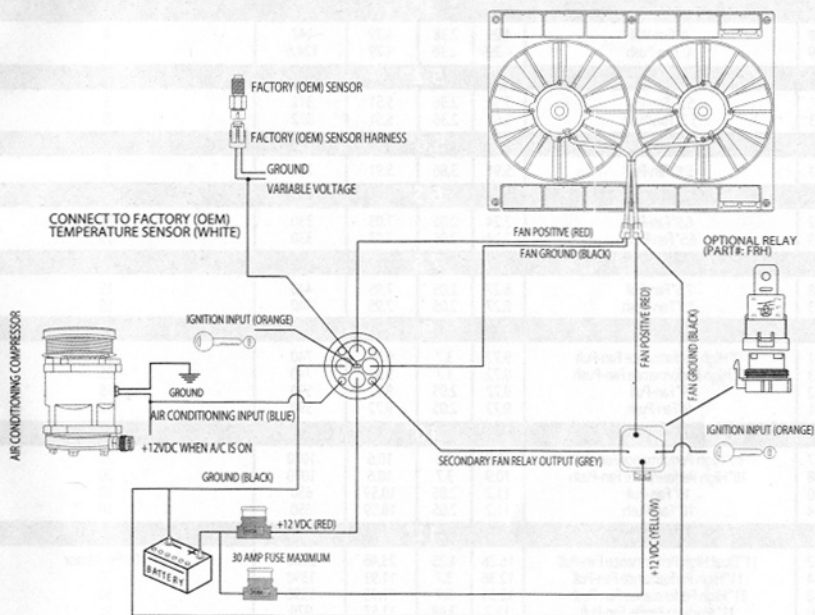
FANS MUST BE FUSED SEPARATELY

Dual Fan - OEM Sensor - with AC:

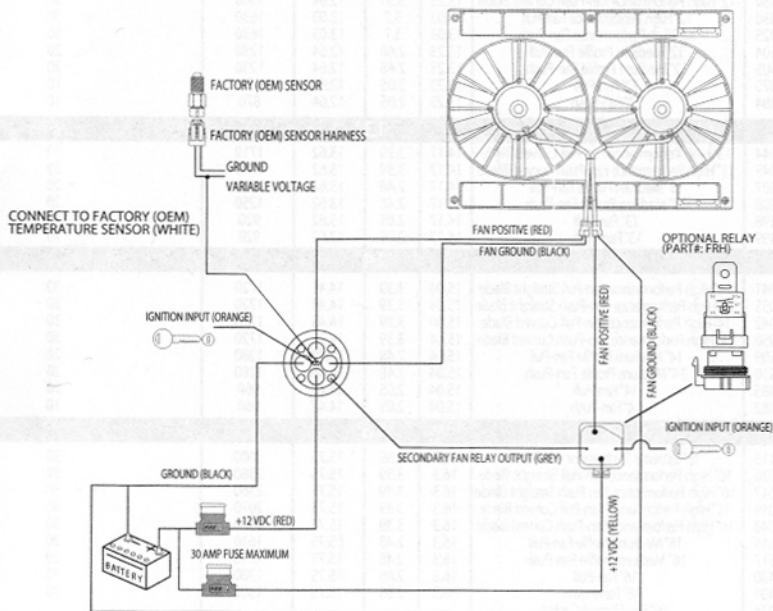
PWM Wire	Connects To:
Large Gauge	
Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground
Small Gauge	
Orange	Ignition
Blue	Air Conditioning Input
Grey	Secondary Fan Output
White	OEM Temperature Sensor
Green/Black	SPAL Temperature Sensor (Not Used)
FRH (fan relay harness)	
Yellow	Positive 12 VDC Directly to Battery
Red	Secondary Fan Positive
Grey	PWM Secondary Fan Output (grey wire)
Orange	Ignition
Black (from Fan)	Chassis Ground

Dual Fan - OEM Sensor - without AC:

PWM Wire	Connects To:
Large Gauge	
Red	Positive 12 VDC Directly to Battery
Black	Ground Directly to Battery
Red	Primary Fan Positive
Black	Primary Fan Ground
Small Gauge	
Orange	Ignition
Grey	Secondary Fan Output
White	OEM Temperature Sensor
Green/Black	SPAL Temperature Sensor (Not Used)
Blue	Air Conditioning Input (Not Used)
FRH (fan relay harness)	
Yellow	Positive 12 VDC Directly to Battery
Red	Secondary Fan Positive
Grey	PWM Secondary Fan Output (grey wire)
Orange	Ignition
Black (from Fan)	Chassis Ground



FANS MUST BE FUSED SEPARATELY



FANS MUST BE FUSED SEPARATELY

Suggested Fuse Values

ITEM#	DESCRIPTION	A	B	C	AIRFLOW (CFM)	RECOMMENDED FUSE VALUE AT 13 VOLTS
4"						
30103018	4" Fan-Pull	4.29	2.38	4.29	147	4
30103009	4" Fan-Push	4.29	2.38	4.29	124.6	4
5.2"						
30103011	5.2" Fan-Pull	5.51	2.36	5.51	312	5
30103013	5.2" Fan-Push	5.51	2.36	5.51	312	5
5.6"						
30100291	5.6" Fan-Pull	5.91	3.86	5.91	295	5
6.5"						
30100402	6.5" Fan-Pull	7.24	2.05	7.03	330	15
30100403	6.5" Fan-Push	7.24	2.05	7.03	330	15
7.5"						
30100358	7.5" Fan-Pull	8.27	2.05	7.95	440	15
30100393	7.5" Fan-Push	8.27	2.05	7.95	440	15
9"						
30102061	9" High Performance Fan-Pull	9.72	3.7	9.37	740	25
30102053	9" High Performance Fan-Push	9.72	3.7	9.37	740	25
30100392	9" Fan-Pull	9.72	2.05	9.72	590	15
30100381	9" Fan-Push	9.72	2.05	9.72	590	15
10"						
30102057	10" High Performance Fan-Pull	10.9	3.7	10.6	1070	20
30102058	10" High Performance Fan-Push	10.9	3.7	10.6	1070	20
30100360	10" Fan-Pull	11.2	2.05	10.59	650	10
30100374	10" Fan-Push	11.2	2.05	10.59	650	10
11"						
30102052	11" Dual High Performance Fan-Pull	16.26	4.25	23.46	2780	30 / Per Motor
30102054	11" High Performance Fan-Pull	12.36	3.7	11.93	1390	30
30102040	11" High Performance Fan-Push	12.36	3.7	11.93	1390	30
30101500	11" Medium Profile Fan-Pull	12.2	2.48	11.57	970	15
30101502	11" Medium Profile Fan-Push	12.2	2.48	11.57	970	15
30100364	11" Fan-Pull	12.2	2.05	11.57	810	10
30100365	11" Fan-Push	12.2	2.05	11.57	810	10
12"						
30102029	12" High Performance Fan-Pull Curved Blade	13.23	3.39	12.64	1360	30
30102030	12" High Performance Fan-Push Curved Blade	13.23	3.39	12.64	1360	30
30102038	12" High Performance Fan-Pull	13.03	3.7	13.03	1630	30
30102025	12" High Performance Fan-Push	13.03	3.7	13.03	1630	30
30101504	12" Medium Profile Fan-Pull	13.23	2.48	12.64	1230	20
30101505	12" Medium Profile Fan-Push	13.23	2.48	12.64	1230	20
30100375	12" Fan-Pull	13.23	2.05	12.64	870	10
30100384	12" Fan-Push	13.23	2.05	12.64	870	10
13"						
30102044	13" High Performance Fan-Pull Curved Blade	14.17	3.39	13.62	1710	30
30102045	13" High Performance Fan-Push Curved Blade	14.17	3.39	13.62	1710	30
30101507	13" Medium Profile Fan-Pull	14.17	2.48	13.62	1250	20
30101508	13" Medium Profile Fan-Push	14.17	2.48	13.62	1250	20
30100398	13" Fan-Pull	14.17	2.05	13.62	920	10
30100399	13" Fan-Push	14.17	2.05	13.62	920	10
14"						
30102041	14" High Performance Fan-Pull Straight Blade	15.04	3.39	14.45	1720	30
30102055	14" High Performance Fan-Push Straight Blade	15.04	3.39	14.45	1720	30
30102042	14" High Performance Fan-Pull Curved Blade	15.04	3.39	14.45	1720	30
30102056	14" High Performance Fan-Push Curved Blade	15.04	3.39	14.45	1720	30
30101509	14" Medium Profile Fan-Pull	15.04	2.48	14.48	1280	20
30101510	14" Medium Profile Fan-Push	15.04	2.48	14.48	1280	20
30100385	14" Fan-Pull	15.04	2.05	14.48	960	10
30100382	14" Fan-Push	15.04	2.05	14.48	960	10
16"						
30102113	16" Extreme Performance Pull Fan	16.3	3.65	15.75	3000	30
30102036	16" High Performance Fan-Pull Straight Blade	16.3	3.39	15.75	2360	30
30102047	16" High Performance Fan-Push Straight Blade	16.3	3.39	15.75	2360	30
30102049	16" High Performance Fan-Pull Curved Blade	16.3	3.39	15.75	2070	30
30102048	16" High Performance Fan-Push Curved Blade	16.3	3.39	15.75	1920	30
30101516	16" Medium Profile Fan-Pull	16.3	2.48	15.75	1610	20
30101517	16" Medium Profile Fan-Push	16.3	2.48	15.75	1610	20
30100400	16" Fan-Pull	16.3	2.05	15.75	1300	10
30100401	16" Fan-Push	16.3	2.05	15.75	1300	10
30130074	16" Fan Shroud Gasket					

SPAL USA

LIMITED WARRANTY STATEMENT

SPAL USA warrants this product to be free from defects in material and workmanship for a period of eighteen (18) months from the date of sale to the original purchaser. SPAL USA will repair this product free of charge if, in the judgment of SPAL USA, it has been proven defective within the warranty period. The product should be returned, at the customer expense, to the location of original purchase. This warranty does not cover any expenses incurred in the removal and/or reinstallation of the product.

This warranty does not apply to any product damaged by improper installation, misuse, abuse, improper line voltage, fire, flood, lightning, or other acts of God, or a product altered or repaired by anyone other than SPAL USA.

This warranty is in lieu of other warranties, expressed or implied, including any implied warranty of merchantability. No person is authorized to assume for SPAL USA any other liability concerning the sale of this product.

IMPORTANT-KEEP YOUR INVOICE WITH THIS WARRANTY STATEMENT!

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