

MECHOTRONIX

VW
Insta-Heat

MECHOTRONIX, LLC
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VW Insta-Heat

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*Installation Guide and Owner's Manual
Revision A7, Revised 9/08/07*

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The Air-cooled VW heating system

In its stock form the heating system on most air cooled VW's utilizes the engine cooling fan, two heat exchangers and a series of vents in the passenger compartment. The cooling fan, mounted on the end of the generator/alternator shaft, provides cooling air for the engine and air into the passenger compartment for heat. The heat is provided by two heat exchangers, sometimes called heater boxes. Each heater box is a finned exhaust header that transfers heat from exhaust gasses to air on its way into the passenger compartment. In the (Type 1 beetle) passenger compartment there are two vents located under both sides of rear seat, two more near the driver and passenger's feet, and a total of five defrost vents spread across the front windshield. As designed this system is uncomfortable in cold weather.

Advantages

Contrary to popular belief the heating system on air cooled VW's is well thought out and produces plenty of heat, the problem is delivering that heat and air flow into the passenger compartment. Using exhaust gasses as a heat source means the heater boxes get hot almost immediately after engine startup. This also means there is more than enough available heat to use for warming the vehicle interior.

Disadvantages

The problem area in the heating system is lack of air flow into the passenger compartment. Since the blower for the heating system is driven by the engine crankshaft, the amount air flow is limited by engine rpm. The engine spends most its time at low rpm in stop and go driving. At low rpm there is simply not enough air flow to adequately heat the passenger compartment or defrost the windshield in cold temperatures. Not only does the passenger compartment take a long time to become comfortable in cold temperatures, the defroster really struggles to keep the windshield clear. Icing or fogging conditions may make the car unsafe to drive.

The Insta-Heat Kit for air-cooled VW's

The Insta-Heat Kit consists of two high capacity, high temperature blowers which we have developed specifically for this product. Other heater booster systems available supply a cheap plastic blower which is not designed for high temperature. The Insta-Heat Kit for air-cooled VW's is designed to utilize the advantages of the stock heating system while drastically improving air flow and heat delivery (Table 1 & Fig 1, next page).

Adding the Insta-Heat Kit to the stock heating system will quickly bring the passenger compartment to a comfortable temperature even on the coldest days (See Figure 1). The kit substantially increases air flow to the defrost vents clearing the windshield quickly and keeping it that way. Adding the Insta-Heat Kit requires no cutting, fabricating, or permanent modification of any kind.

All of the plumbing, wiring, and hardware is included. The high quality blowers are constructed of precision machined aluminum housings and easily handle air temperatures to 300 degrees Fahrenheit. The high power motor is located out of the air stream and is well protected from the elements. You should expect years of trouble free service and even if something finally does wear out every part in the system is user replaceable.

Also included in this kit is a state of the art blower speed control that easily mounts under the dash. The blower speed is infinitely variable putting you in complete control of the air flow with a simple slide of the switch. There is even a low voltage lockout built in so if your charging system fails or the battery voltage gets low the blowers automatically shut down. The comfort and heater performance found in modern cars is now available for your air cooled VW.

	Air Velocity (fpm) At Rear floor vent
Stock System	550
Marine Bilge blower	1200
With Insta-Heat	2400

Table 1: Air Flow Improvement with Insta-Heat
Data taken from 1969 Type 1 with stock doghouse setup (thermostat flaps fully open with engine at 1000 rpm)

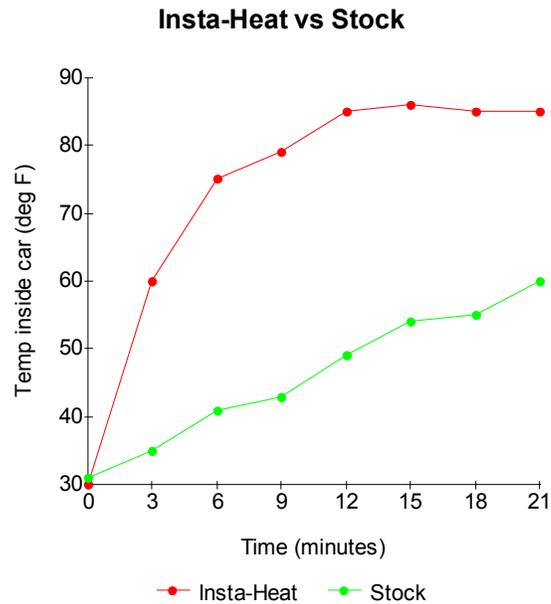
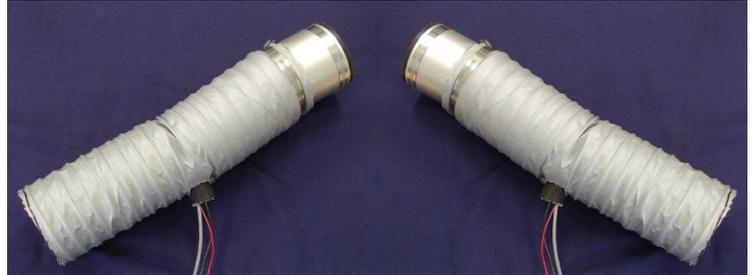


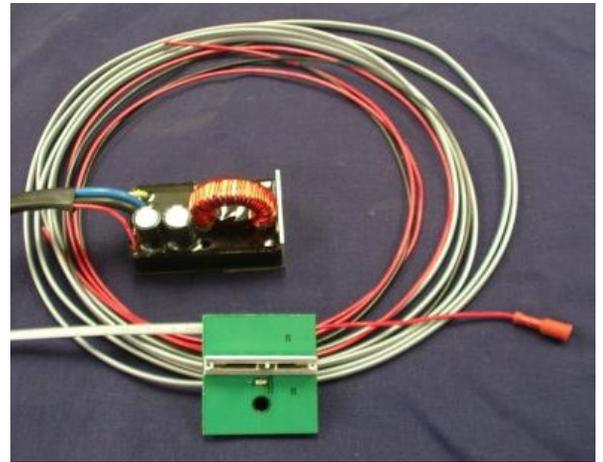
Fig 1—Time vs Temperature Graph: Compares stock heater performance with Insta-Heat kit installed. Data collected on a 1969 Type 1 Beetle during typical stop and go driving. Ambient Temp = 25 deg F

Insta-Heat Kit Contents

1. 2 Blower assemblies



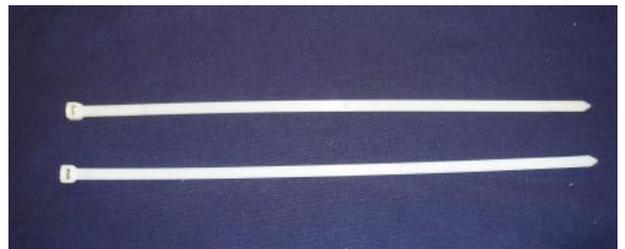
2. Blower Speed Switch, Wiring harness, & Blower Controller



3. 4 Rubber adapter bushings



4. 2 large cable ties



Pre-Installation Checks...

The Insta-Heat system uses as much of the stock heating system as possible. Before installing the Insta-Heat Kit there are a few items that should be checked to ensure proper operation.

1. *The Thermostat and Control Flaps*

Located on the passenger side under the cylinder head is a bellows style thermostat that controls a set of flaps in the doghouse (see Figure 2 & 3). When the engine is cold the flaps direct air into the heating system and away from the engine allowing for faster warm up. If the thermostat assembly is missing or not working properly, engine damage, poor drivability, and longer warm-up time may result. Make sure your thermostat is working. Call us for more information if you have any questions.



Fig 2 - Thermostat



Fig 3 - Thermostat with doghouse flaps

2. *Heater control cables and flaps*

Located on each heater box towards the front of the vehicle there is a cable attached to linkage that operates a flap inside the heater box to turn the heat off and on (See Figure 4). The heater box flaps are controlled from inside the vehicle by a lever located on the passenger side of the emergency brake handle (See Figure 5A). When the knob is down the flaps in the heater box should be fully closed. There should be no air flow out of any the vents in the car.

The other knob located on the driver side of the emergency brake controls a set of flaps in the rear floor vents (See Fig 5B) This knob in the down position closes the rear flaps and directs air to front of the vehicle and defrost flaps. Pull the knob up and the rear flaps open allowing air flow to all of the vents in the car. To check for proper operation of controls have a helper operate the knobs while you check the corresponding flap to make sure its opening and closing properly.



Fig 4 - Set of Heater Boxes removed from vehicle

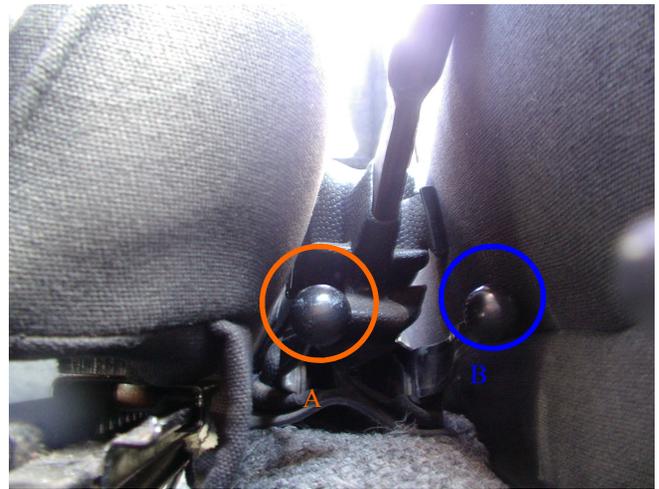


Fig 5 - Heater Control Knobs

3. Be sure plumbing is in place and in good condition

For Beetle Type 1: Starting at the dog-house there should be two hoses on each side than run down to each heater box. Leaving each heater box is another hose that connects to a duct protruding out of the car under the rear seat. (These hoses are no longer used with Insta-heat Kit) . Inside the car under the rear seat there is Y-duct on each side surrounded by insulation. Here, the flow splits off to front and rear. Moving forward the air flows down two channels along each side of the car. A vent on each side near the driver and passenger's feet steals air flow from the side channels. Each channel connects to a duct in trunk which splits into a 3-way y-connector. The center of each 3-way both head to the center defrost vent. One of the two larger hoses, out of the 3-way, go to a corner defrost vent. Each of the other large hoses tee off to the fresh air box and the defrost vent located directly in front of the driver/passenger. See page 10 for a diagram of air flow on Type 1 standard beetles.

4. Clean the engine compartment and make sure engine seals are in place

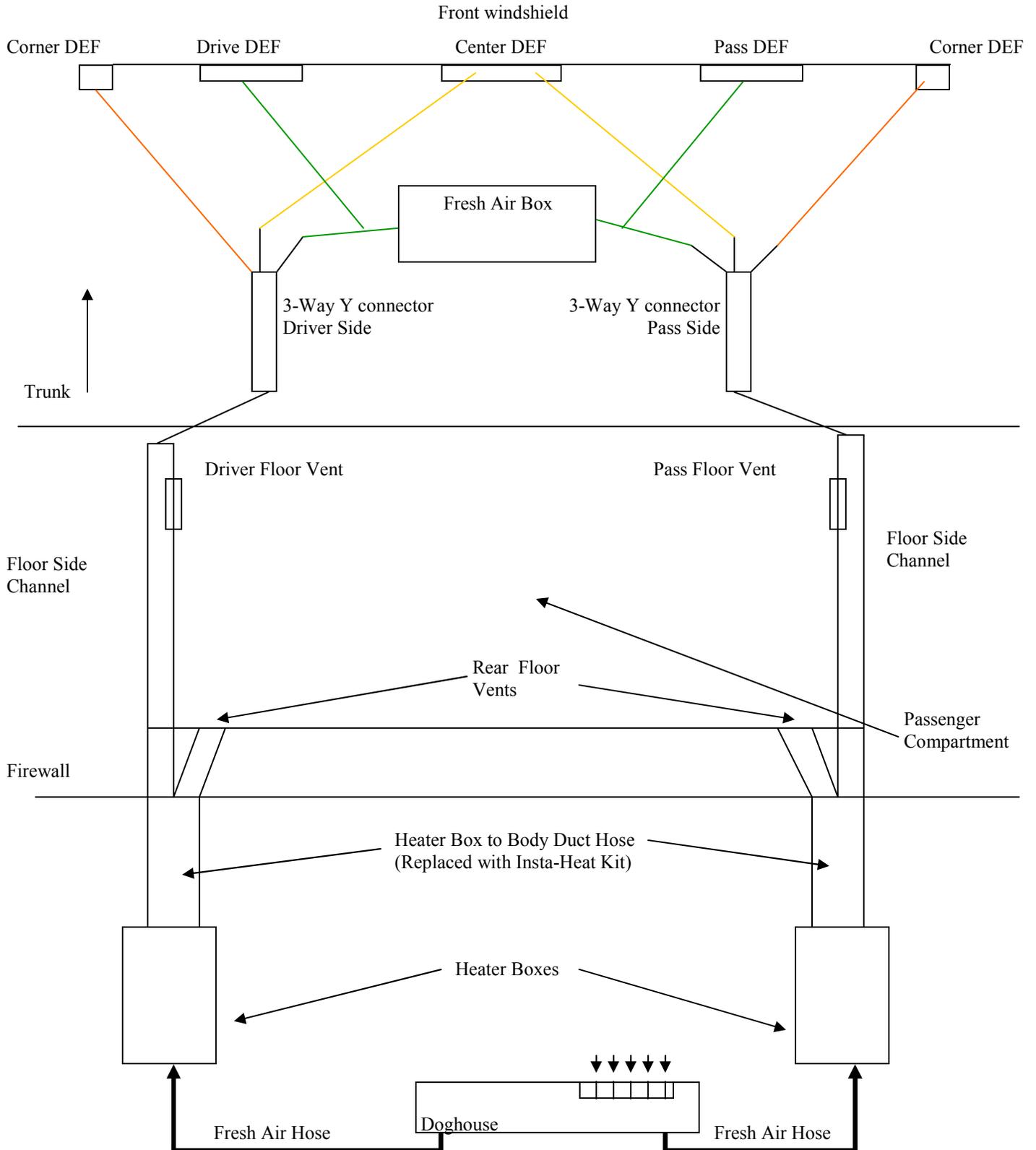
The engine cooling fan draws fresh air from outside into the engine compartment and then through the dog house. A dirty engine compartment will cause bad smelling and unhealthy air to mix in with the fresh air. This air contaminates the passenger compartment when the heater is turned on. To prevent this problem a good power wash with soap and water at a local car wash should do the trick. Cover the air cleaner and water sensitive engine components first. Now is a good time to also fix any oil leaks which lead to the dirty engine in the first place. Leaking or missing engine seals will also cause heater problems plus overheating. Contaminated air will leak into the engine compartment and then find its way into the passenger compartment.

5. Make SURE heater boxes are in good shape.

On older rusted VW's leaking heater boxes can be a problem. A leaking heater box can pump exhaust gasses directly into the passenger compartment causing serious health concerns. If the engine compartment is clean and all seals are in place but there is still a foul smell inside the car a leaking heater box may be at fault. Replace both heater boxes before installing the Insta-Heat kit. Note: There are a few different versions of replacement heater boxes available. Only the finned type will provide enough heat to keep the car warm even in moderately cold climates.

See the last page of this manual for more information.

Air Flow Diagram for Type 1 Beetle 1963 through 1975



Step-by-Step Installation Instructions

1. Remove duct hose on each side.

There is a section of duct hose on each side of the vehicle that connects the outlet side of the heater box to a plastic fitting on the body. (See Fig 6) This section of duct hose must be removed. On the heater box outlet there are two metal ears that hold the duct hose onto the heater box.. Bend the ears back and slide the hose off toward the front of the vehicle. On the body side slide the hose off toward the rear of the vehicle. The procedure is the same for both sides.



Fig 6 - Heater Box to Body Duct Hose



7a-Installing rubber boot onto heater box



Fig 7b - Installing blower assm onto heater box

2. Install blower assembly in place of duct hose

With the duct hose removed, bend the ears back on the heater box to make room for the rubber adapter bushing. Slide the blower assembly into place starting with the rubber boot onto the heater box (See Figure 7a). Then slide blower tube onto to the rubber bushing (7b). Position the blower so the black motor vent tube points toward the ground. Tighten the hose clamp to secure the blower assembly to the heater box. Next, take the rubber bushing and slide it over the plastic fitting on the body. (see Figure 8 Note: Your bushing may be black or yellow as shown) Now slide the end of the flexible duct over the rubber bushing on the car. (see Figure 9) Secure the duct hose to the fitting on the car with the large cable tie provided. Repeat this procedure on the other side.



Fig 8 - Slide bushing onto plastic fitting on the body



Fig 9 - Fabric duct slides over rubber bushing

3. Wiring Harness Installation

Install the blower speed switch in a convenient location under the dash. The board fits nicely in the location shown at the right. (Fig 10) Take the red 18 AWG wire and connect to a fused Key-On +12 voltage source. Now remove the rear seat in order to place the main blower controller and gain access to the battery. Place the main controller in the area under the rear seat (driver side) opposite the battery. Take the 14 AWG red wire and connect it to the positive battery terminal. Wait until installation is complete before inserting the fuse. Connect the 14 AWG black wire to the negative terminal on the battery. Run the longer set of red and black 18 AWG wires (coming out of the main controller) to the passenger side blower. The other (shorter) set of 18 AWG red and black wires go to the driver side blower. There are few rubber grommets under the rear seat the wires can pass through. Route the gray wire from the blower speed switch up front to the main blower controller under the rear seat. Connect the gray wire connectors. Finally, insert the 20 amp fuse into the fuse holder. Complete wiring diagram is shown below in Fig 11.

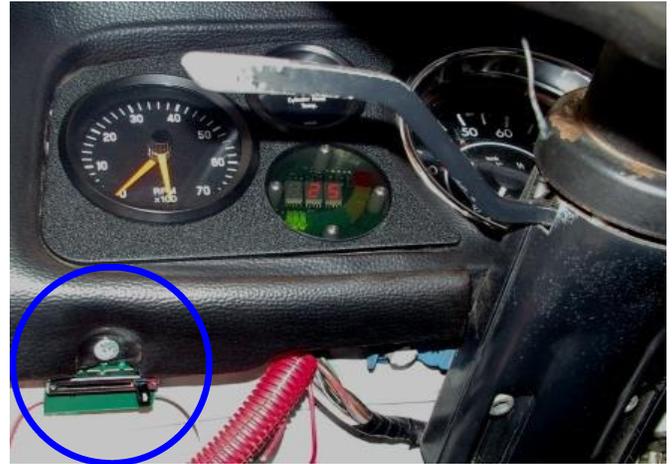


Fig 10 - Blower Speed Controller Mounted Under the Dash

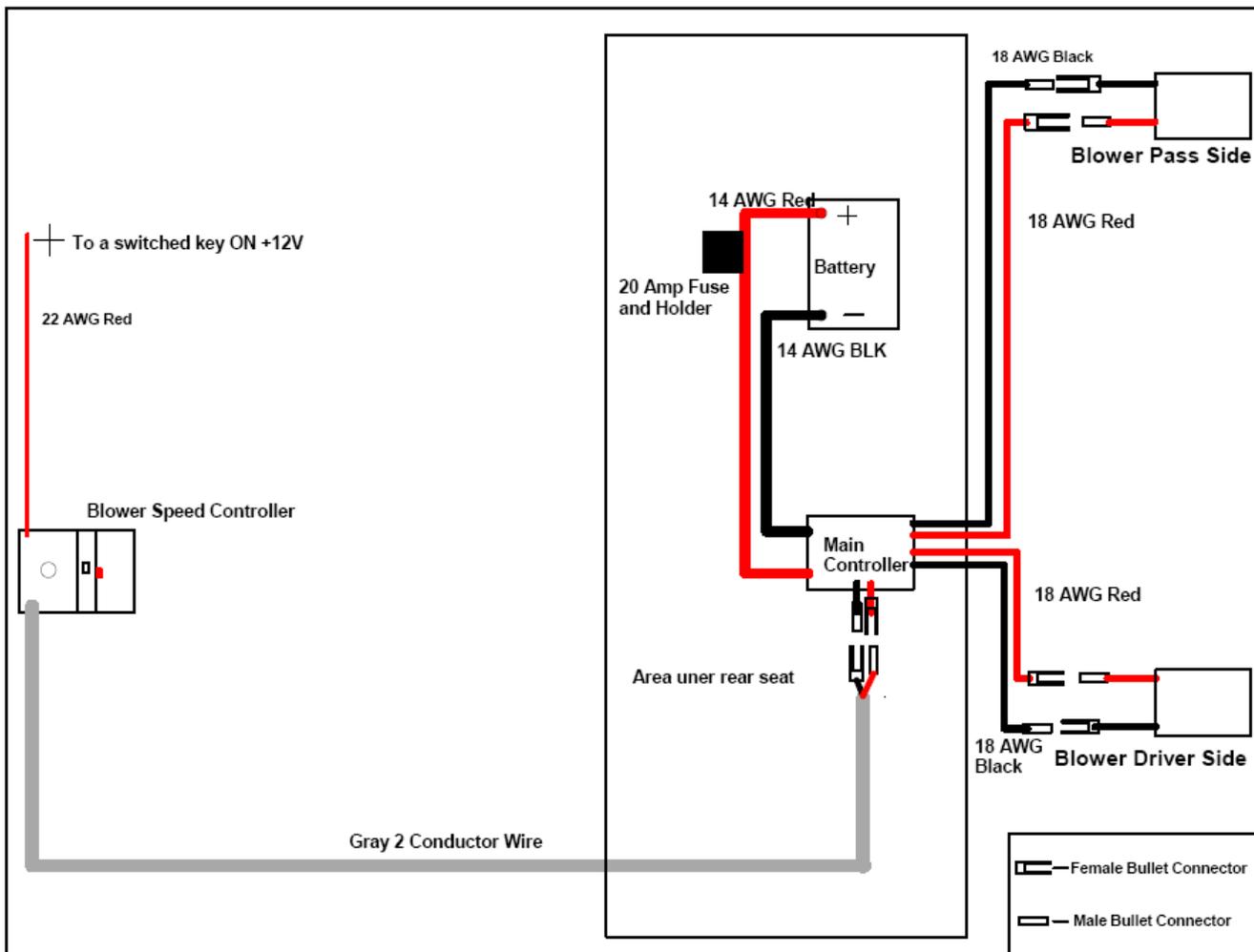


Fig 11 - Complete wiring diagram



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Mechotronix, LLC warrants that the Insta-Heat Kit will be free from defects in materials and workmanship for a period of One (1) year from the date of purchase.

If the product proves defective during the warranty period, Mechotronix, at its option, will:

1. Repair the product by means of telephone support or depot service at no charge for parts or labor,
2. Replace the product with a comparable product which may be new or remanufactured, or
3. Refund the amount paid for the product, less a reasonable allowance for usage, upon its return.

Mechotronix recommends the customer first utilize support materials shipped with the product, product diagnostics, information contained on the web, and email support. If unsuccessful, to obtain service under this warranty the Customer must notify Mechotronix Telephone Support or its authorized service representative of the defect before the expiration of the warranty period. Customers will provide appropriate assistance to Telephone Support personnel to resolve issues. If telephone support is unsuccessful, Mechotronix or its authorized service representative will provide warranty repair at a designated depot site:

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Dayton, NV 89403

Mechotronix reserves the right to charge for depot service in exceptional cases. A description of the depot process may be obtained from the local Mechotronix Customer Support Center or authorized Mechotronix distributor. Depot service is at Mechotronix' or its authorized service representative's sole discretion and is considered an option of last resort. If the Customer's product contains features that enable Mechotronix or its authorized service representative to diagnose and repair problems with the product remotely, Mechotronix may request that the Customer allow such remote access to the product. In the maintenance of the product, Mechotronix may use new or equivalent to new parts, assemblies or products for equal or improved quality. All defective parts, assemblies, and products become the property of Mechotronix. Mechotronix may require the return of parts, assemblies, and products to a designated Mechotronix Depot or the Mechotronix representative from which the part, assembly, or product was originally purchased. Return and claims will be handled according to the current Mechotronix procedure. These warranties shall not apply to any defect, failure, or damage caused by improper use or inadequate or improper maintenance and care. Mechotronix shall not be obligated under these warranties:

- a. to repair damage resulting from attempts by unqualified personnel to install, repair, or service the product unless directed by a Mechotronix representative;
- b. to repair damage, malfunction, or degradation of performance resulting from improper use or connection to incompatible equipment or machinery;
- c. to repair damage, malfunction, or degradation of performance caused by the use of non-Mechotronix supplies or consumables or the use of Mechotronix supplies not specified for use with this product;
- d. to repair an item that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product or degrades performance or reliability;

- e. to perform maintenance or cleaning or to repair damage, malfunction, or degradation of performance resulting from failure to perform maintenance and cleaning as prescribed in published vehicle documentation;
- f. to repair damage, malfunction, or degradation of performance resulting from use of the product in an environment not meeting the operating specifications set forth in the product's documentation;
- g. to repair damage, malfunction, or degradation of performance resulting from acts of God or nature, acts of terrorism, explosion, flood, fire, war, and riots;
- h. to install replacement items that are considered customer replaceable;

Any service identified in the above list and provided by Mechotronix at the Customer's request shall be invoiced to Customer at Mechotronix then-current rates for parts, labor, and travel.

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TO THE EXTENT ALLOWED BY LOCAL LAW, EXCEPT FOR THE OBLIGATIONS SPECIFICALLY SET FORTH IN THIS WARRANTY STATEMENT, IN NO EVENT SHALL MECHOTRONIX AND ITS VENDORS BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CON-SEQUENTIAL DAMAGES

Additional Information and Resources

For a more detailed description of the entire stock heating system and its function visit:

<http://www.vw-resource.com/heat4.html>

Or feel free to give us a call at 928-773-0189