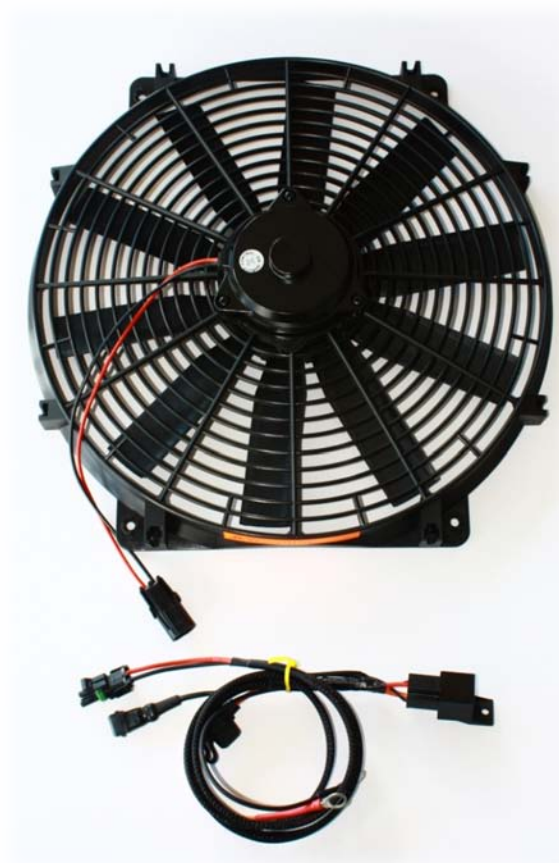


MILLER PERFORMANCE



Smart Fan Installation

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1. General Information

1.1 Introduction

The Miller Smart Fan is a great way to take cooling and control of it to the next level! Let your ECU determine when the fan needs to be triggered, increase horsepower by removing the clutch fan. Have control of something you didn't have control over before! This manual will guide you through the quick installation of the Smart Fan.

1.2 Smart Fan Description

The Miller Smart Fan features the following:

- Easy to install wiring harness
- High CFM 16" Electric Fan
- ECU Controlled operation
- Improved engine performance

1.3 Parts Included

Part Number	Description	Quantity
MPC-SFK-0100	Miller Smart Fan Harness	1
MPC-PWF-150	16" High CFM Fan	1
MPC-SFT-20XX	Smart Fan software	1






1.4 Tools Required

The Following tools and supplies (not included) or similar tools and supplies are required for fast and proper installation of this Miller Performance product:

Minimum requirements:

- Flathead Screwdriver
- Philips Screwdriver
- Various socket wrenches
- Various Box Wrenches
- Coolant Catch Pan
- Soldering Iron
- Solder

1.5 Safety and Precautions

	Warning: Ensure vehicle cannot roll when working on the vehicle
	Warning: Disconnect the ground strap (negative) whenever doing work on electrical or fuel systems.
	Warning: Never run the engine unless the work area is well ventilated. Carbon monoxide kills!
	Caution: Before starting each procedure, ensure that you have all the necessary tools and parts on hand. Read all instructions thoroughly; do not attempt shortcuts use only parts and materials that are included in this kit or approved by Miller Performance.
	Caution: Be careful when using soldering iron. Temperatures can be in excess of 400 degrees and burns can be serious.

2. Installation

2.1 Clutch Fan Removal

IF YOU ALREADY HAVE AN E-FAN INSTALLED SKIP THIS SECTION AND GO TO SECTION 2.4

In order to install your Miller Smart Fan you will need to remove the factory clutch fan as well as the radiator. Removing the radiator make the installation much easier and also is a good opportunity to do a coolant flush.

1. Remove clutch Fan. The clutch fan is a reverse thread, using a long wrench in a quick motion; you will want to “crack” loose the threads. After you have loosened the clutch fan simply spin it off with your hand.



Figure 1: Crack Threads loose



Figure 2: Spin Fan off by hand

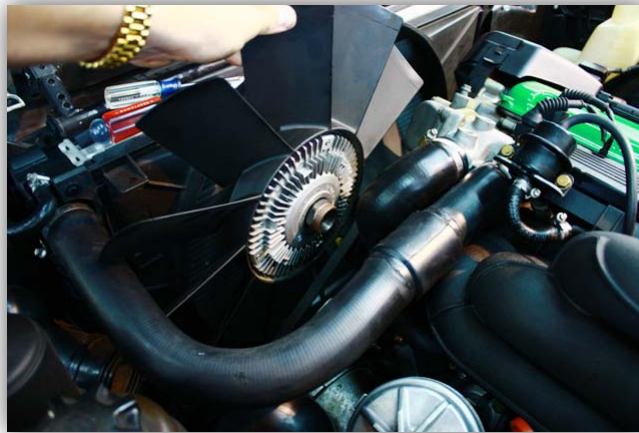


Figure 3: Remove Clutch Fan Carefully

2. After you have removed the clutch fan successfully, you are now ready to remove the radiator.

2.2 Radiator Removal

Removing the radiator will make installation much easier.

1. Remove all 3 hoses from the radiator and let the coolant drain into a catch basin. There is a radiator drain plug on the bottom driver's side. There are two hoses on the top Drivers side, and one on the bottom passenger side.

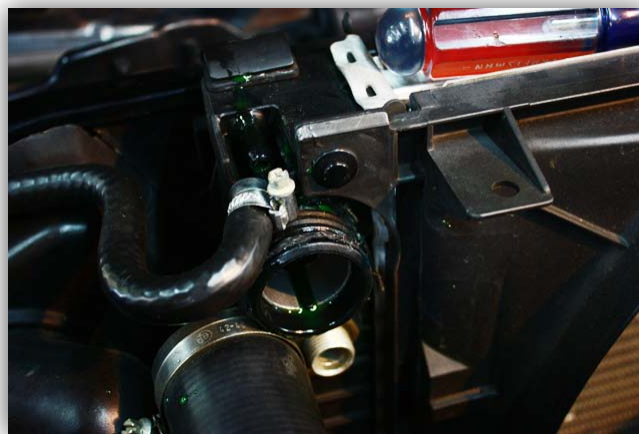


Figure 4: E34 Radiator

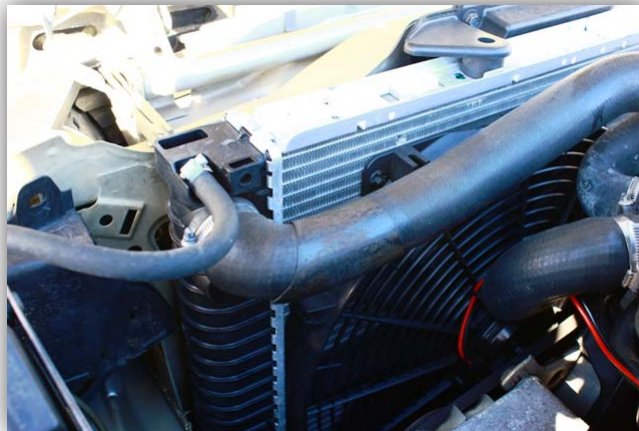


Figure 5: E30 Radiator



Figure 6: Items removed from E30



Figure 7: Coolant draining from radiator

2. Once you have drained the coolant from the radiator, you can now remove the radiator. We will illustrate how to remove the radiator for both e30 and e34 cars.

2A. E34 Removal

There are two plastic tabs on either end of the radiator. Taking a flathead screw driver, you will want to gently pry the tabs back. Be careful not to damage the tabs, they can break easy if manhandled too much.

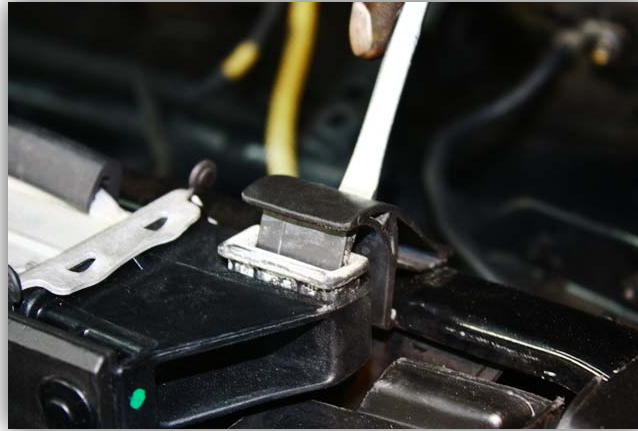


Figure 8: Removing Tab



Figure 9: Tab Removed

2b. E30 Removal

There is a plastic brace on the top of the radiator that secures it in place. Simply remove the two screws that hold this bracket in place and the radiator will be able to be pulled out.



Figure 10: E30 radiator brace

3. Make sure you unplug any sensors that are on the side of the rad. The radiator will now be able to be lifted out. Be careful as there may still be some coolant in the radiator.



Figure 11: E34 Radiator removed

2.3 Electric Fan Placement

The placement of the E-Fan on the radiator may vary, but we suggest these locations for best fitment. The actual fixing of the fan to the radiator is to be done outside of the engine bay for ease of installation. Be sure to confirm fitment before completely reinstalling everything.

E34 Placement

On the E34 radiator you will have enough room to place the fan anywhere really. We suggest putting the fan on either end of the radiator but not in the middle.



Figure 12: E34 Fan Placement

E30 Placement

On the E30 room fan placement is a little more crucial. Placing it on the driver's side of the radiator just a few "rows" down from the top. This should fit just perfect once the rad is back in the engine bay. Confirm this before you secure the radiator in place.

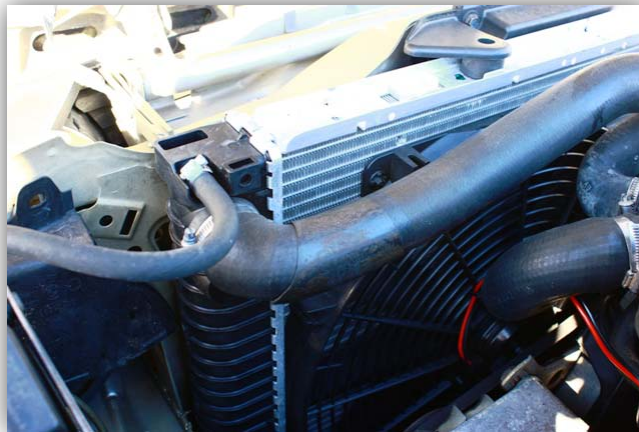
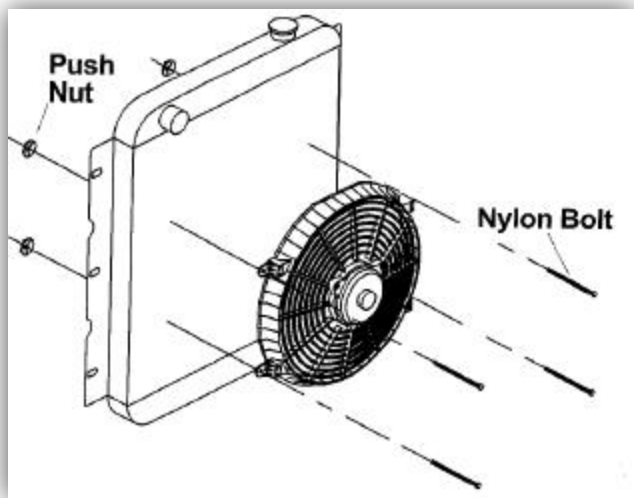


Figure 13: E30 Fan Placement.

You are now ready to fasten the fan to the rad. Refer to the mounting instructions on sheet of paper included in the fan box.

- A. Mark the hold for the fan mounts with a marker.
- B. Pass a small Phillips screwdriver through the marked holes CAREFULLY spreading the fins to allow easy passage for the nylon bolts. Fit the bolts through the mounting tabs and pass them through the holes in the rad.
- C. Push the speed nut on until snug
- D. Cut off the remaining bolts leaving about a 1/4" sticking out.



2.4 Installing Wiring Harness

Take the Smart Fan wiring harness and unravel it. You will notice three “ends” to the harness.

1. Disconnect your battery if you haven't already.
2. Unplug the charcoal canister solenoid valve. The smart fan harness will plug into that plug. You will see there is only one plug it will fit on our harness.
3. Plug the fan plug on our harness into the Fans connector
4. Take the eyelet connectors and attach them to the starter. Black goes to **NEGATIVE (-)** and red goes to the **POSITIVE (+)** terminal on the starter.

If you already had an electric fan...

1. Take the wiring from your current electric fan and remove it.
2. The wiring loom from the electric fan needs to be modified.
3. Take the supplied 2 pin male connector and fasten it to the wires. Make sure you orient the wires correctly for proper fan direction and flow.
4. After you have soldered the male pins to the wires, insert them into the Male connector. You have now modified your existing electric fan.

Be Creative with how you mount/route the wiring harness. Here is an example of mounting it by the relay.



3. Reassembly

3.1 Installation of Software

Before you can begin using your smart fan be sure that your smart fan tune is installed. You may have purchased a MAF conversion with your smart fan, or a W.A.R. Chip. Either way, make sure you are using the software that came with the Smart Fan to ensure it operate properly.

If you have a WAR Chip, load the WAR Chip with the file that was provided to you.

1. For e34 the ECU in the E-box on the passenger side of the engine bay (Upper Side). Using a Philips screwdriver undo the four screws.

For E30's open the glove box and remove plastic cover to expose the ECU located on the top of the glove box compartment.

2. Now the ECU will be exposed. Using a 10mm socket wrench, undo the two 10mm nuts.
3. Unplug the ECU from its connector harness.

The Chip contains the software required for your vehicle to operate. Avoid high static areas. Also avoid dropping the chip and spilling liquids on it.

4. You need to take the metal case off of the ECU. There are tabs all the way around the bottom side. Using a small flat screwdriver gently lift up the tabs to release the ECU. Be careful not to bend the tabs too far as they may break.
5. Once you have the ECU open and the chip side exposed you are ready to replace your current chip. Carefully pry evenly on each side of the chip back and forth until it is free from its holder.
6. Take the chip that came with your Smart Fan and install it in place of the original one. Make sure that you align the small notch (half circle) on the chip, to the small notch on the ECU; this will insure your chip is installed properly.

You have successfully completed all steps required for the ECU. You can now reassemble the ECU and glove box or E-box. You can now reconnect the battery.

3.2 Reinstall Radiator Assembly

With the fan attached to the radiator carefully slip it back into place. Make sure that if your radiator has rubber “foot pads” that they line up with their respective holes or holders on the rad-support.

Check to make sure that the smart fan will fit and not interfere with any pulleys and make sure that you reconnect the hoses, and plug in any sensors you removed. Fill the coolant system with coolant.

3.3 Bleeding Your Coolant System

1. Loosen the bleeder screw, which is on top of the thermostat housing assembly, by turning it counterclockwise with the screwdriver. The coolant will flow out of the housing without the engine on.
2. Tighten the bleeder screw by turning it clockwise when you no longer see air bubbles coming out of the screw.
3. Set the heat temperature on the interior heat controls to the hottest setting, and set the fan to the highest speed. Start the engine and let the car run.
4. Open the cap on the coolant reservoir tank by turning the cap counterclockwise and pulling it off the tank. Watch the coolant level, indicated by the marks on the side of the tank, and pour in more coolant if the level drops below the lower mark.
5. Open the bleeder screw again once the car has reached normal operating temperature. Then tighten the screw after there are no more air bubbles coming out around the screw. Check the coolant level in the reservoir tank periodically, and refill it to the upper mark on the tank as needed.
6. Repeat Step 5 until all of the air is out of the radiator and cooling system. You may need to repeat the process five or six times to fully bleed the system. Turn off the car.

Make sure your coolant system is completely bled. You risk overheating if you have any air pockets in the system. When bleeding, always keep an eye on your coolant temperature gauge to make sure you don't over heat while bleeding.

4. Drive Your Vehicle

4.1 Initial Driving

Remember to connect your battery before you start your vehicle. Also remember to bleed your coolant system. Once you have done this you will be ready to test your newly installed Smart Fan.

****Note: When you unplug your ECU it loses its “memory” and the car may drive rough for the first few minutes. Drive the car around for ten minutes and the car should be running smoothly again.**

Keep an eye on your coolant gauge to ensure you bled the system adequately. You should see your smart fan cycling on and off at various speeds based on your coolant temperature!

4.2 Trouble Shooting

If you are experiencing problems with your smart fan operation please check the following:

1. Ensure all your wiring was installed correctly.
2. Ensure you installed the proper software.
3. Ensure the Fan is plugged in.

If you cannot resolve the problem please phone us and we will help walk you through a solution. You can reach us at our toll free number, 855 269 8863. We will not let you go unsatisfied.

