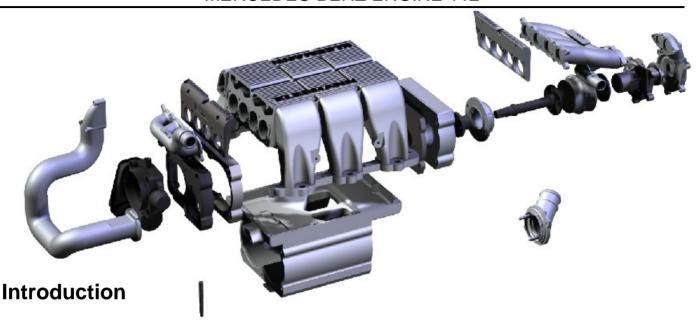
MANUAL

INSTALLATION OF

KLEEMANN Comfort Power COMPRESSOR KIT V6

MERCEDES-BENZ ENGINE 112



These fitting instructions constitute a helping hand for the installation of the KLEEMANN Compressor System. It is recommended to read the instructions before installing the kit, so that you can gain an overview of the entire installation before you begin. If questions arise during the installation, you are welcome to contact us. KLEEMANN A/S will be ready

to answer questions and provide assistance. Please do not hesitate to call us with any inquiries. It is essential to all of us that the final installation results in a properly tuned car and a satisfied customer.

Yours faithfully Soren Jess General Manager, KLEEMANN A/S

Kleemann Guarantee

After installing the KLEEMANN Compressor System please fill in the warranty form. Send or fax a copy to KLEEMANN, keep a copy for yourself and give the original to the customer. For the Kleemann warranty to be effective the form must be returned to KLEEMANN after the 1500 km service.

Professional and qualified persons should only carry out the installation. The responsibility for correct installation rests solely with the mechanic installer, and KLEEMANN A/S is not responsible for injuries that may be inflicted upon equipment or persons due to insufficient installation. The installation instructions and the belonging instructions are only intended as a guide and cannot be regarded as exhaustive. The information in these instructions has been carefully revised and is considered correct. However KLEEMANN A/S assumes no responsibility for the contents in case of inaccuracies, and KLEEMANN A/S cannot under any circumstances be made responsible for any loss or damage occurring as a direct or indirect consequence of the application of the material. KLEEMANN A/S is not under obligation to update the material or inform the purchasers about any updates.

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Edited by Morten Piil Gøttrup

You will find special installation instructions for the C, CLK, SLK, S Class and the ML Class in the back of this manual.

IMPORTANT while the car is still stock, be sure to check the millivolts from the oxygen sensor at full acceleration (black wire). Record the millivolt value. You will reference this value after the installation of the KLEEMANN Compressor System to make sure that the fuel mixture is correct.

Before the installation of the KLEEMANN Compressor System the engine and engine bay should be thoroughly cleaned.

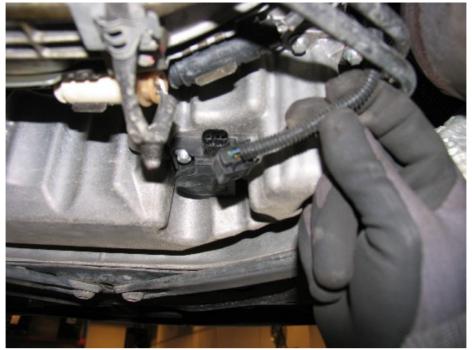




Dismount:

- The plastic cover over the engine.
- The intake pipe between the throttle body and air filter box, including the airflow meter.
- The clip holding the water hose near the oil filter.
- The wiring harness connections to:
 - EĞR valve
 - Ignition coils, injectors
 - Throttle body
 - The manifold adjustment valve.





- The oil level (access from under the car)
- All vacuum connections to the intake manifold, throttle body, brake booster, and fuel lines.
- The intake manifold.
- The knock sensor wires (disconnect the plug and run it under the water hose at the left rear cylinder head, and reconnect).
- The accessory belt. Remove the idler pulley that sits at the highest point of the engine. The long bolt holding this idler pulley will be used again.
- Install new spark plugs Use only Kleemann certified spark plugs

On the wiring harness you have the valve for long/ short intake.

Modify it like this:





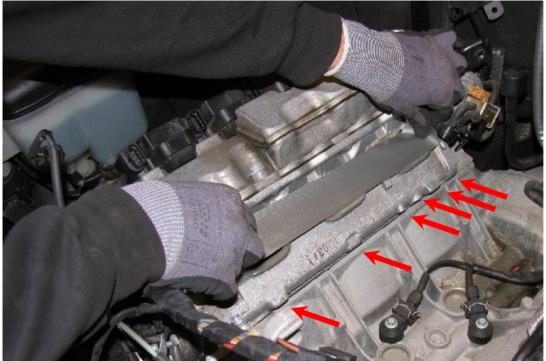
• Empty the cooling system



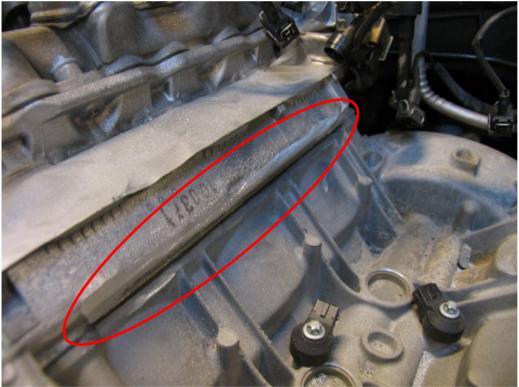
make sure that nothing have entered the ducts, like some of the screws from the O.E. manifold

Cover up all the intake ducts on the cylinder heads with duck tape.





On the lower inside edge of each cylinder head there are several casting tabs. These tabs are indicated with arrows on the picture below. These tabs must be ground off in order for the compressor fit properly (the contour of the cylinder head should be consistent after the tabs are ground).



Use a die grinder with a course HSS bit to remove the tabs, as a shallow short bit will pack with aluminium and cutting will be difficult.

Occasionally lubricate the bit with naphtha, cleaning solvent or a similar chemical.

Do not use oil; clean up of the chips will be very difficult with this lubricant.



The bracket for the air pump has to be modified in order for the make clearance of the front water manifold of the intercooler. Use a hacksaw.

Cut off the back of the clamp



Cut the bracket down the middle as shown



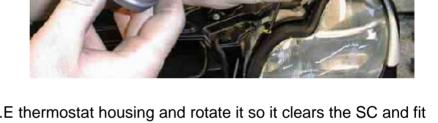


Empty out the cooling system



Remove the thermostat with a pair of needle nose pliers. It is important to remove the thermostat as shown in the picture or permanent damage to the thermostat will be the result!

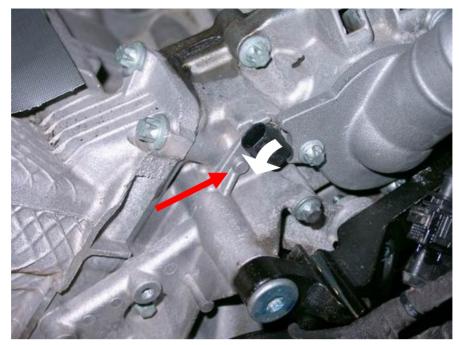
Install the thermostat in the KLEEMANN thermostat housing.



On the SLK you have to use the O.E thermostat housing and rotate it so it clears the SC and fit bigger washers to the screws. Note that the screws do not fit the holes anymore but are lined up against the edge of the holes which is why we recommend bigger washers.







Mill spot, so that temperature sensor can be fitted horizontal to make space for the Kompressor drive shaft..



A M8 tread has to be made in the O.E. water pump to fit the Kleemann bracket, use the long M 8 torx bolt from the O.E. pulley wheel in the other side.





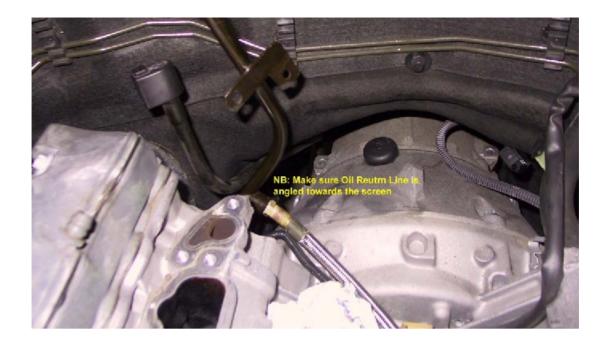
Fit 2 washers on to the support pulley in order to make it fit the motor block



Fit the Kleemann support pulley wheel to the bracket and fit the belt

Empty out the oil on the engine

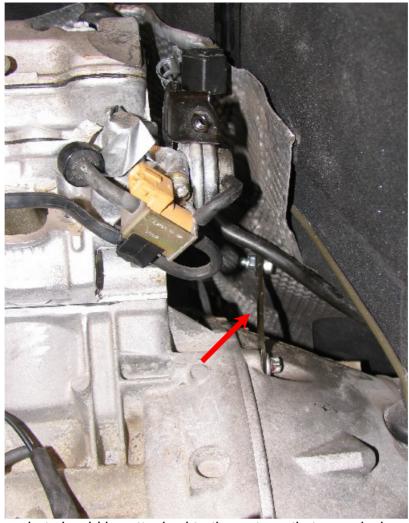




Dismount the alternator and the oil dipstick tube. Install the new KLEEMANN dipstick tube. Reinstall the alternator. Remember to have a bucket under the car so that the oil from removing the dipstick tube is collected.

Install the KLEEMANN oil return line to the dipstick tube. Route the oil line under the exhaust manifold, and up into the "V" of the engine. (Note - Special instructions for the W203 in this document)





The oil return line bracket should be attached to the automatic transmission dipstick tube. If the car has a manual transmission, the return line bracket can be attached to the battery cable bracket. Use the holder from the kit



All following procedures need to be completed prior to installing the KLEEMANN Compressor System on the engine.

Remove the EGR pipe from the factory manifold.

Cut off the portion of the EGR tube that fits inside the manifold. Make sure that the pipe is cut flush with the flange.



Install the EGR pipe on the KLEEMANN manifold. Use the original screws and gasket. **Apply Loctite 243 on the screws**.



Remove the throttle body from the original manifold and install it onto the KLEEMANN manifold. Use the screws and the gasket supplied from the kit. The longest screw is placed where the arrow point on the next picture





Remove the vacuum dashpot from the front of the original manifold. Exercise caution when removing the actuator arm. The mounting holes of the vacuum dashpot are not in the correct orientation so as to operate the bypass valve. You will have to modify the vacuum dashpot mounting in order for it to fit the KLEEMANN Compressor System:

- Press out the two metal sleeves from the dashpot.
- Slot the mounting holes with a die grinder so they match the mounting points on the KLEEMANN Compressor System.
- Countersink the holes with a ninety-degree counter sink.
- Gently turn the bypass lever arm counterclockwise to its stop. Install the vacuum dashpot to the KLEEMANN Compressor System - snug the screws, do not tighten.
- Adjust the orientation of the vacuum dashpot so the actuator arm is 4 to 5 mm longer than the bypass lever arm. Tighten the screws.
- Gently press in on the vacuum dashpot actuator arm and connect the ball socket joint.
- Make sure that the leaver arm does not jam in any position, if it does then grind the screws on the top to prevent this from happening.
- Attach a hand vacuum pump to the vacuum dashpot. The vacuum dashpot should open the bypass valve with vacuum applied, and close when vacuum is removed. Once you have verified operation of the bypass valve, connect the vacuum dashpot to one of the vacuum outlets on the inlet of the compressor.





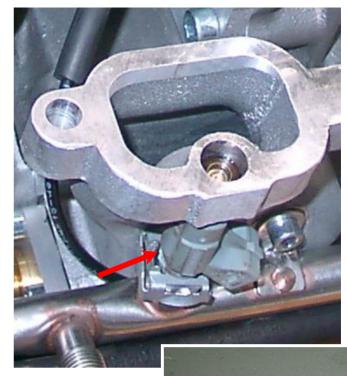
From this point forward, is important to never rest the weight of the compressor on the vacuum dashpot.

Install the KLEEMANN oil feed line to the compressor. Use the 10 x 1.0 banjo bolt with the 0.8mm restrictor inside.

Use Loctite 243 on the threads.

Remove the original fuel injector rail and dismount all of the injectors from the rail:

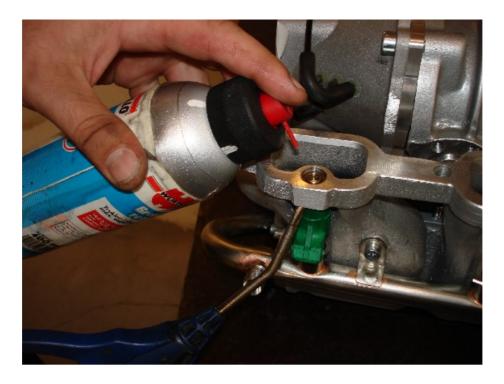
- Cut off the locating tab on the inlet end of the fuel injectors so that it's possible to reinstall each injector and rotate it 360 degrees. (note. Arrow)
- Lubricate both o-rings on all injectors so they are not cut or pinched. (USE Silicone grease)
- Install the fuel injectors in the KLEEMANN fuel injector rail.
- Install the KLEEMANN fuel rail with the injectors onto the KLEEMANN manifold.
- Apply sealant to the four fuel injector rail screws and install them into the KLEEMANN manifold. The fuel rail mounting holes are tapped through the manifold and using sealant ensures that there are no vacuum/ pressure leaks.





locating tab is cut off.





Turn the KLEEMANN manifold upside down. To check for leaks: Spray a small amount of brake cleaner into the injector seat holes. Use an air gun (as shown) to apply air pressure to the upper side of the seat to se any leaks between the O-ring and the seat. Make sure that the injectors are sealed fully against the fuel rail and that the injector clip is locked



Cut off the breather hose as shown, and install it onto the throttle body.



Lift in the KLEEMANN manifold / compressor as a complete unit, be very careful not to hit the vacuum dashpot on any thing.

- Make sure that the manifold is all the way down to the gasket surface and enough material was grinded away from the engine bay - If not, more has to be grinded.
- Lift up the complete unit in the front
- Lift up the KLEEMANN manifold in left and right side and slip in the manifold gaskets.
- Fit the 8 pcs. M 8 x 30 screws and tighten the manifold.



Install the EGR valve (you may need to grind a small portion of the EGR valve body for clearance). Install the EGR pipe.





Attach the vacuum line from inside the car and the EGR actuator vacuum line to the inlet flange of the compressor using the T fitting.



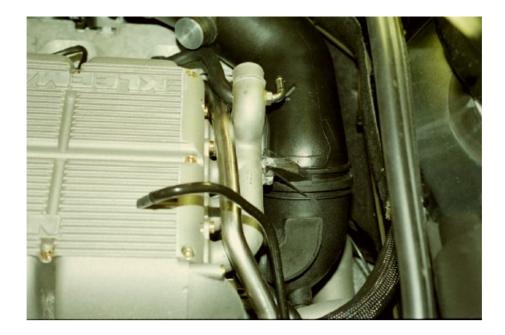
Re-route the engine wiring harness so that it passes under the water manifold. Reconnect all plugs to their original locations. Use zip ties to secure the engine wiring harness to the fuel rail.

The air intake pipe needs to be modified:

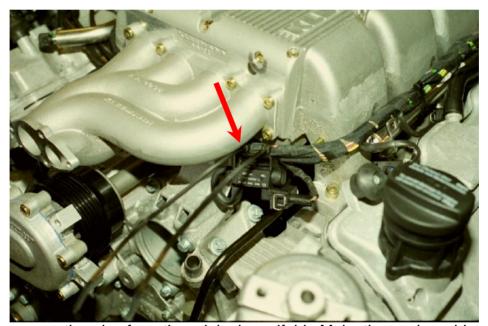
- 1. Cut off approximately 5mm of the clip, that holds the pipe under the throttle.
- Cut off the mounting arm over the throttle.
 Drill a 6mm hole in alignment with the 6 mm holes on the intercooler water outlet manifold.
- 3. Remove the resonance pipe from the air intake pipe's middle section and install the blind plug.







Install the intake pipe and the breather hose (Be very careful not to break any of the small fittings- if any of these small fittings are broken a false air leak will result, causing a lean mixture and possible engine damage).



Install the magnetic valve from the original manifold. Make the engine wiring harness connection only (no vacuum lines).



Throttle body and vacuum installed.



Carefully heat the end of the plastic vacuum hose that runs from the Brake booster to the engine and pull out the white snap on connector that is fitted on the original hose. Heat up the plastic vacuum hose again and push the supplied vacuum connector on to the vacuum line while it is hot, so it is a tight fit.

Cars with EBC, SBC (R230, W211 etc.) plug the hole with the attached fitting.
Use thread sealing when installing the plug. (marked with arrow)

When fitting the pulley wheel on the SC the Numbers have to face the SC. If there are no number just remember that the long sleeve of the wheel have to face the SC.

When installing the pulley wheel you may have to grind/file a little in the groove but only till it is a tight fit on the axle.



Tank ventilation



Connect the supplied hose to the 8mm pipe on the inlet housing using the supplied cobra clamps, in order to connect the tank ventilation. Next to the 8 mm tap there is two 4 mm taps. Mount the vacuum line so that it is long enough to reach the front of the compressor.



Cut the coolant line from the expansion tank. Install the plastic T-piece connection. Connect the supplied hose between the third leg of the connector and the outlet water manifold stub on the back of the SC. (One Way Valve has to be fitted also so do not connect to the stub yet.)





Mount the One Way Valve between the hose coming from the third leg of the T-piece and the SC. Important; the arrows on the valve (red arrow) MUST be pointing towards the SC outlet. (One Way Valve must be assembled using Thread sealing)

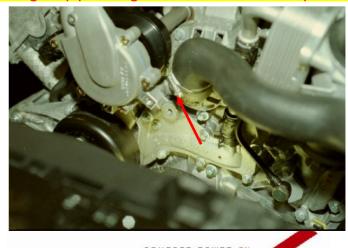
Fit back the air filter box.

Remove the oil filler tower from the valve cover. Observing the orientation shown in the picture, drill a 8.7mm hole in the upper edge of the filler tower. Do not drill through the threads for the filler cap! Thread the hole using a 10 x 1.0 mm tap. Install the 90 degree pipe fitting in the filler tower, re-install the filler tower in the valve cover.

Install the oil vapor breather hose from the 90 degree pipe fitting on the front of the compressor

to the 90 degree pipe fitting in the oil filler tower.

Rotate the water pump on its drive shaft to expose the water manifold inlet. Thread the accessory belt through the opening. Rotate the water pump back to align the flange. Use the 6 x 1.0 mm bolts (4 pcs) to attach the pump to the flange. Use caution when rotating the water pump as to not disturb



.





Air pump and vacuum lines



Take the vacuum lines from the SC and mount one on the MAP sensor (GREEN arrow) in the front of the engine and one on the air pump valve (RED arrow). Mount the O.E vacuum lines between the vacuum dash pots (BLUE arrows) and the Air pump valve. Use the supplied KLEEMANN hose to attach the air pump to the dash pots hose. Extend the positive lead to reach the auxiliary air pump, ground to the chassis. Due to a wide variety of equipment available on different vehicles a definitive location cannot be suggested.



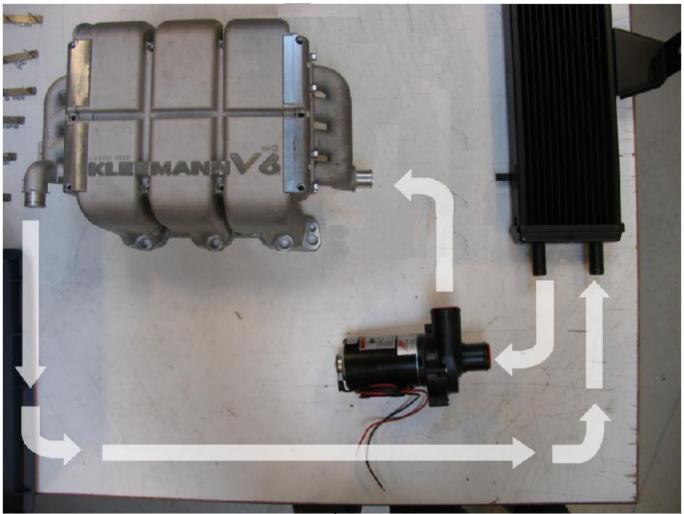


Remove the front bumper. You may have to remove some of the radiator covers for access to install the KLEEMANN radiator. Install the KLEEMANN radiator as shown in the picture. On some models the O.E radiator has to be lifted in order to install the intercooler. On other models the intercooler can be bolted directly on to the front bridge.



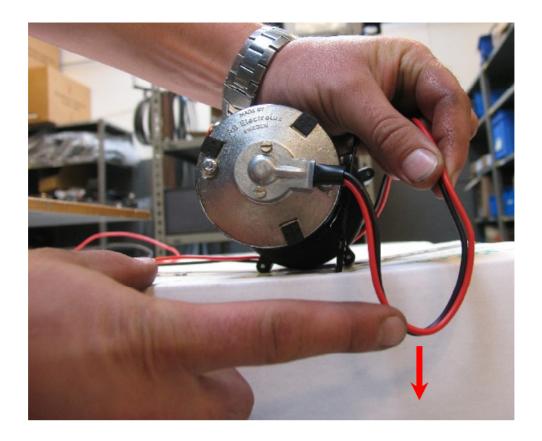
Electric water pump installation

The water pump is mounted in the lower right front side of the engine bay, just behind the fog light. On some cars a different location maybe preferred due to the wide variety of equipment on MB cars. Place the pump on the side member, using the water pump bracket and the rubber damper. On the side member there are pre-fabricated holes on all cars that fit the bracket. This location is universal on all V8 cars except on the ML, where it's placed inside the engine bay, on the other side of the side member.



Assemble the water hoses so that the water flows as the arrows shows. It is extremely important to set the pump at either 100% vertical or level. Any offset angles may cause the pump to malfunction.

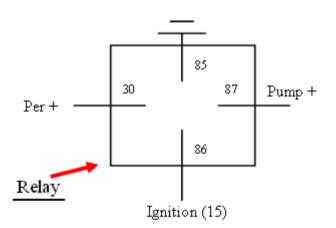




To prolong the life expectancy of the pump, do a loop that faces down, on the wires from the pump, so if the water should run along the lines it will drip instead of going in to the pump and cause malfunction.



A wire is drawn form the pump+ to the relay box where it is joined in the kit relay as shown.







Fill the intercooler system with a 50/50 mix of antifreeze and water. It is important to always use a 50/50 mix even in warm climates as the antifreeze inhibits corrosion of aluminium parts. If the car is raised in the back the air will then move towards the reservoir hence the refill will be a lot quicker. This will also relieve the system of trapped air pockets.

Trapped air pockets in the IC system will greatly reduce the cooling and therefore could cause serious engine damage.

Check all connections and install the bumper and any covers. Remove the small reservoir when the system is full and fit the waterline.





Install KLEEMANN warning/ information plate as shown in picture.

Check the engine oil level. Check and re-check all fasteners, joints, wiring, clamps etc.



Installing the KLEEMANN fuel regulator:

C (W202), **E** (W210), **S** (W220), **CLK** (W208) and **SLK** (R170): **C** (W203) see special instruction on page 20 - **ML** (W163) see special instruction on page 24

- Dismount the cover around the fuel pump and fuel filter (sitting under the car in the rear end).
- Feed the 4.5 meter vacuum line from the engine bay to the rear of the car. Route the line in such a way that it does not come in contact with sharp or hot objects. This vacuum line is the actuator for the fuel pressure regulator, if it becomes damaged in any way there will be a lean condition under boost. Serious engine damage can occur!
- Attach one end of the vacuum line to the port on cylinder number 4. The opposite end of the vacuum line will be attached to the signal port on the KLEEMANN fuel regulator.
- On the fuel filter there is a hose marked "TANK". This is the fuel return line. Cut the hose
 and install the KLEEMANN fuel regulator. The regulator is installed between the fuel filter
 and the fuel tank. The hose from the fuel filter is connected to the port on the side of the
 regulator. The hose to the tank is connected to the port on the bottom of the regulator.
 Attach the vacuum signal line to the port on top of the regulator.
- Loosen the jam nut on the adjustment shaft of the regulator. Back the adjustment shaft
 out until you feel no resistance on the shaft. Turn the shaft in until you just feel the shaft
 contact the diaphragm spring and stop. Tighten the jam nut.

Use the KLEEMANN bracket to locate the regulator in a safe place. The regulator should not be allowed to come in contact with any other surrounding parts. Make sure the regulator is mounted securely and cannot move.

VERY VERY IMPORTANT use Loctite on the adjustment screw.

Install the cover.





Fill the cooling system and check the engine oil level.





Check and re-check all fasteners, joits, wiring, clamps etc.

Start up procedure:

- Reset the engine management system with MB HHT, CarSoft or similar product.
- Start the engine, check for air, oil, fuel and water leaks.
- Install a vacuum/pressure gauge with a t connector at the cylinder #4 port. Check to see that appropriate vacuum is present at idle 0,5 bar (14 to 18 in/hg). If the vacuum reading is low there is a leak. Quickly depress the accelerator to see that boost pressure is present 0,4-0,5 bar (maximum of 7 psi). If the boost reading is low there is a leak or a install error at the bypass.
- Check again to see that the intercooler is completely filled. If there are air pockets the coolant will not circulate and the intercooler is useless.











IMPORTANT:

Before road testing the vehicle the following steps MUST be carried out! Failure to follow these simple instructions can lead to serious engine damage.

- Locate the signal wire from the oxygen sensor (black wire).
- Use a digital multimeter to measure the millivolts from the oxygen sensor. An analog meter does not have adequate resolution for this procedure.
- Start the vehicle and let it idle for a few minutes. Once the oxygen sensor has fully
 warmed up the millivolt reading will cycle up and down with 600 mv as a middle value. If
 the millivolt reading does not cycle up and down there is a problem with the installation. A
 steady low mv reading indicates a lean condition, check for vacuum leaks. A steady high
 mv reading indicates a rich mixture, check the fuel pressure to make sure the pressure is
 approximately 3,8 bar (55 psi).
- Locate the multimeter and vacuum/pressure gauge inside the vehicle for a road test.
- If at any time during the following tests abnormal operation occurs (detonation, excessive boost, low my reading, etc.) immediately stop the test and find the source of the problem.
- The first test will be a short acceleration run. Depress the accelerator fully for a short distance. Verify that the boost pressure does not exceed 0,5 bar (7 psi.) Repeat the same acceleration run again and check to see that the mv reading from the oxygen sensor is a minimum of 1150 mv (915 mv for C/W203, E/W210, AND SLK/R170 from 7/00 onwards). The mv reading should match the stock mv reading taken before the installation of the KLEEMANN compressor system.

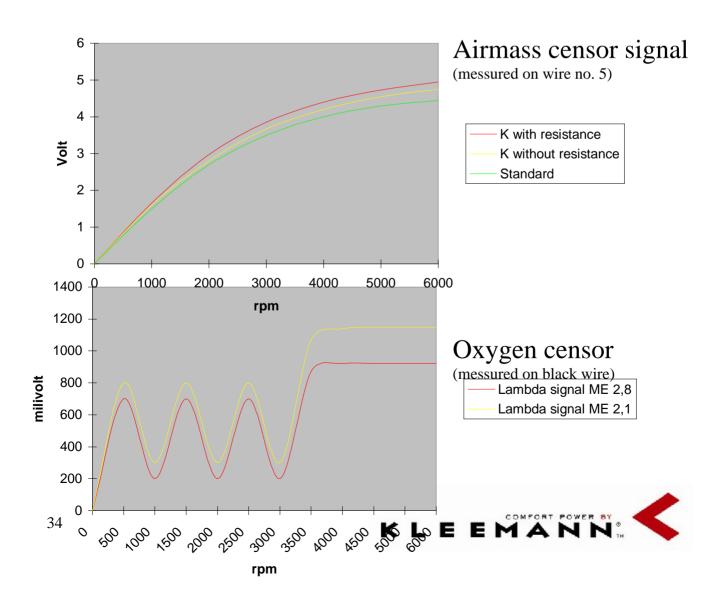


 The second test will be a long acceleration run (from 2,000 rpm in third gear). Check the same parameters as the short acceleration run. At no time during the acceleration run should the mv reading from the oxygen sensor fall below the minimum valve of 1150 mv or 915 mv (see above).

Cut the plastic engine cover according to the diagram on page 16A and install the cover.

IMPORTANT TECHNICAL DATA

Engine size (ccm)	Engine management	Pulley size (mm)	Boost (bar)	Belt length (mm)	Suggested air mass resistance
2400	ME 2,1 Before 05.2000	95	0,5	2570	0
2800	ME 2,1 Before 05.2000	87	0,5	2550	0
3200	ME 2,1 Before 05.2000	80	0,4	2530	0
2600	ME 2,8 After 05.2000	87	0,6	2550	450 Ohm
2800	ME 2,8 After 05.2000	87	0,5	2550	300 Ohm
3200	ME 2,8 After 05.2000	80	0,4	2530	300 Ohm



Special instructions for vehicles with auxiliary air pump D4

Remove the two vacuum dash pots from each side of the manifold.

Remove the screws holding the tops and diaphragms.

Switch the left side dash pot top and diaphragm to the right side dash pot and vice versa.



Grind the aluminum housing of the dash pots so they fit back onto the KLEEMANN intake manifold.

Take the vacuum signal from the inlet of the compressor, next to the throttle body and run it to the dash pots.

Use the original hose to connect the two inlets.



Install the air pump where space is available.
Due to different equipment available on different vehicles a definitive location cannot be suggested.

This picture shows the auxiliary air pump installed on a CLK320 behind the valance panel and behind the driving light left side.



Use the KLEEMANN hose to attach the air pump to the dash pots.

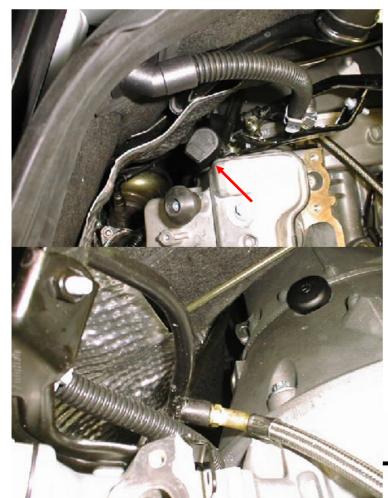
Extend the positive lead to reach the auxiliary air pump, ground to the chassis.

C Class W 203 special instructions - page 1



Mount the auxiliary air pump behind the valence panel and behind the driving light right side.

Find instructions on page 17.



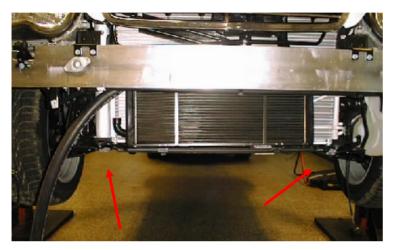
Move the automatic transmission oil dipstick as shown in the picture.



The oil pin is placed different on the C W203.

Attach the compressor oil return line to the new KLEEMANN engine oil dipstick tube before installing the dipstick tube. Remove the original engine oil dipstick, install the KLEEMANN engine oil dipstick tube.

C Class W 203 special instructions - page 2



Install the intercooler radiator behind the aluminum frame.

The upper radiator bracket uses three holes already behind the aluminum frame.

The lower braket fits between rubber cushions and the original radiator frame.



It is necessary to clamp the output voltage of the mass airflow meter.

Cut wire number 5 near the plug end (yellow/white wire).

Solder the KLEEMAN resistor inline with the wire (resistance is 300 ohms).

The W203 throttle body housing is of a different shape than other throttle bodies.

The casting sprues on the throttle body motor need to be ground flush.





A small amount of material needs to be removed from the lower left corner of the outer housing around the throttle blade (see picture) to clear the bypass pipe.

C Class W 203 special instructions - page 3

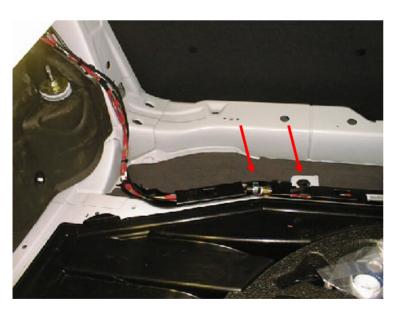


The C W203 has an in-tank centerfugal fuel pump. This pump is not able deliver enough pressure for proper fuel mixtures for full boost at high engine speeds. The pump booster gives the fuel pump 17VDC when boost pressure is present.

Fit the pump booster inside the trunk on the left side above the wheel well. Find the black/green wire and cut it. Attach the red wire of the pump booster (fused) to the leg of the black/green wire that runs to the relay. Attach the other red **without** fuse wire to the leg of the black/green wire that runs to the

tank. Attach the black wire of the pump booster to the chassis.

Adjust the volume switch to MAX.



Connect the pressure switch the red and black wire. Locate the switch in the wiring harness channel as shown. pull a vacuum line form the KLEEMANN fuel pressure regulator under the vehicle, use a t fitting.

Pass the vacuum line through the rubber plug in the bottom of the trunk floor.





Install the KLEEMANN fuel regulator using the bracket.

Mount the bracket to the chassis at the stabilizer mounting.

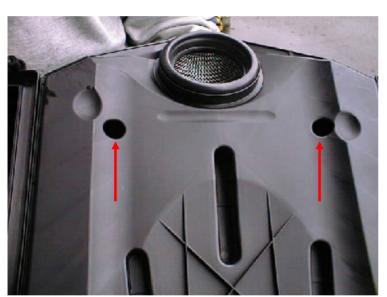
Warning:

Mercedes-Benz had a problem with the fuel pump on W 203 up untill approx. Feb. 2001.

If the fuel pump bear a number which is 00T277 or lower, the pump has to be replaced with: **203 470 05 94.**

USA models 203 470 13 94. If this not is observed, severe engine damage can occur

C Class W 203 special instructions - page 4



Remove the two air filter elements from the filter housing.

Remove the two screws in the bottom of the air filter housing.

Drill out the two pins inside the air filter housing.



Be sure that the pins are completely removed.

Further instructions on page 23, top right corner





The back edge of the air filter housing is too high in the C class.

Heat the back edge of the air filter housing with a heat gun until it is slightly soft.

Press the back edge of the air filter housing down 10mm (0,5 inch). Using slight pressure in a hydraulic press will give a even, clean edge.

Fit the air filter box as shown on page 22 + 23

A new air filter housing is being developed as a direct replacement for the original unit.

Available in May 2001.

S Class W 220 special instructions – page 1

The installation of the KLEEMAN compressor system on the S-Class is the same as other MB models with the exception of the following:

Engine cover, air filter housing, mass airflow meter position, and the intercooler radiator installation.



Install the original 90 degree intake hose on the throttle body.

Remove a small amount of material from the outside of the mass airflow meter to clear the water outlet manifold.

Install the KLEEMANN aluminum adaptor onto the mass airflow meter.

Install the complete unit on the vehicle.









Remove the 4 rubber mounts from the valve covers.

Install the rubber mounts onto the KLEEMANN extension arms.

Install the extension arms onto the valve covers so that the rubber mounts are the highest point.





S Class W 220 special instructions – page 2

Heat the underside of the air filter housing at the back edge. Depress the plastic to clear the KLEEMANN manifold.





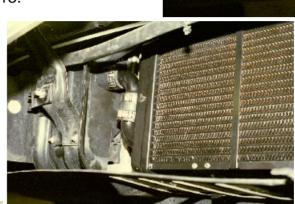
Install the KLEEMANN radiator support rail under the original radiator. Place the two legs of the KLEEMANN radiator into the support rail. Attach the to bracket to the vehicles chassis.



Cut an oval hole in bottom cover to pass the two water lines into the inner fender.

Remove the plastic shield between the inner fender and the engine bay to make room for the waterlines. Follow the hose routing on page 13.

Fit the water lines to the Kleemann manifold, the highest point of the radiator goes to the back of the the lowest goes to the front the water pump.



manifold, with



The complete S-Class W 220 with Kleemann Compressor.



NOTES







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