

BMW 5 Series (E34) Condenser Change

1995 540i manual RHD

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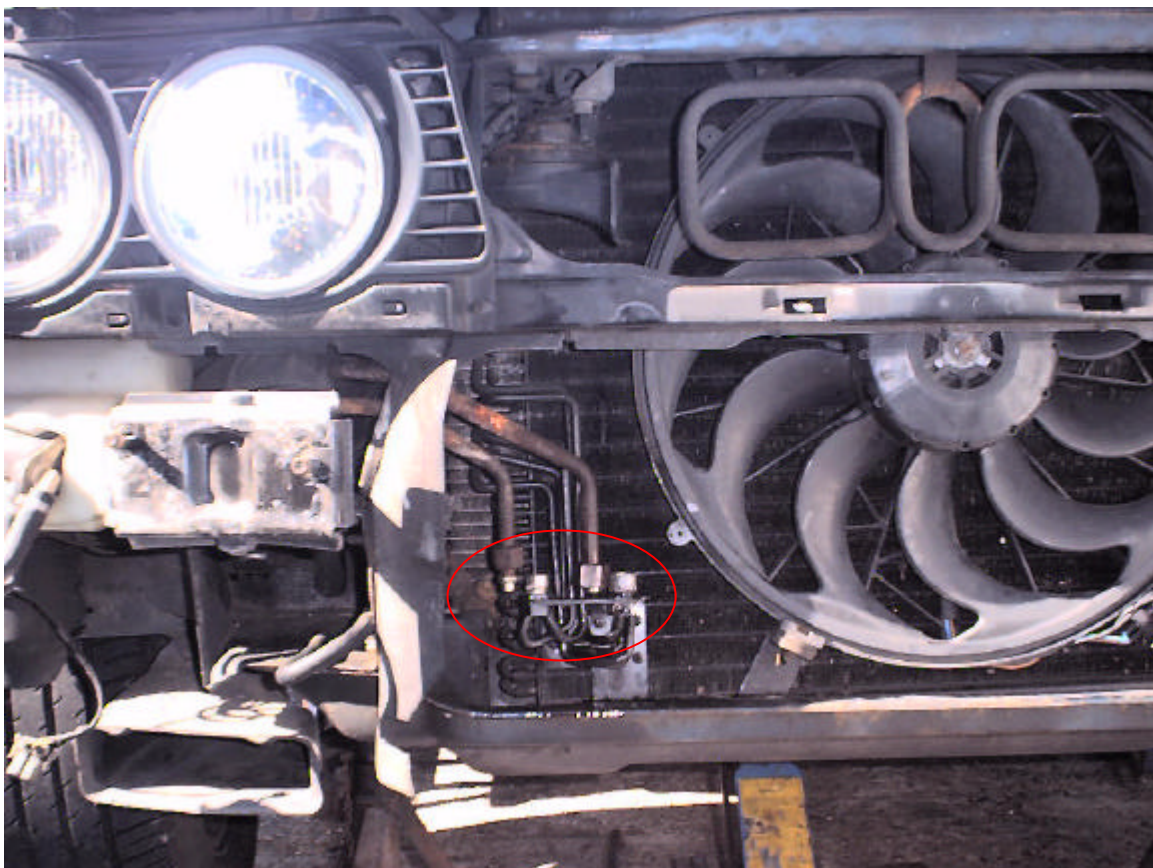
If your air conditioning has stopped working the chances are you have lost most or all of your system refrigerant. The fastest way of finding out is to attempt to have the system refilled by a specialist. They will evacuate any remaining gases and then pressure test the system before refilling. When mine was pressure tested it was immediately obvious that there was a leak somewhere within the condenser matrix situated in front of the engine radiator.

I was shocked to be quoted £500 for the work by a local specialist so decided to carry out the work myself. A replacement condenser cost me £130 in the UK including VAT and I would estimate the time required for the job to be around 2-3 hours. Allow a little longer if you intend to clean up any corroded pipes while you are in there. A test and re-gas once the work is completed is around £60.

Make sure the system is totally depressurised before doing anything – releasing any remaining refrigerant is bad for the environment and also illegal.

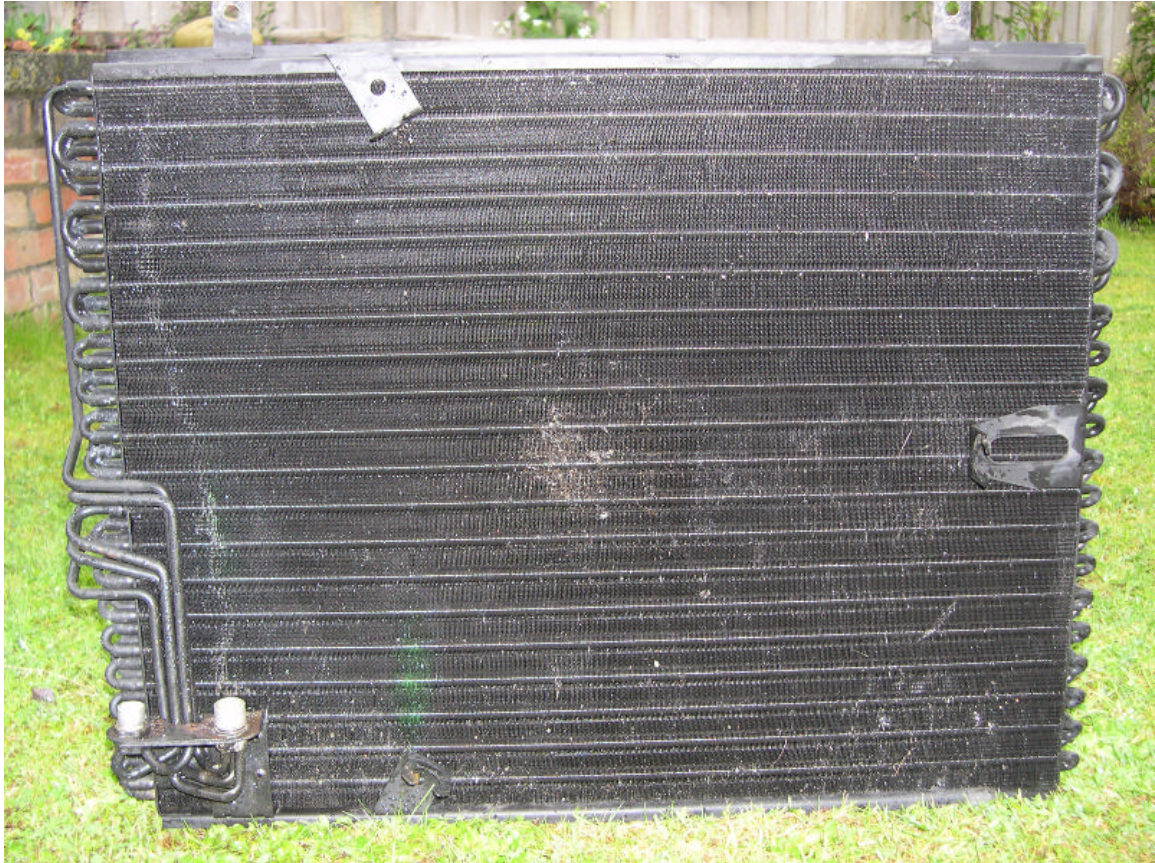
- First of all, get the car off the ground – get the front wheels clear of the ground and supported on axle stands or ramps. You will need around 1.5 feet to remove the condenser from below.
- Open the bonnet and remove the trim from around the headlamps. You do this by releasing two plastic clips either side of the outer lamps with a long screwdriver and then pulling gently. 4 clips situated in the centre grill also need released before removal – this is documented in the headlamp section of this site.
- Get underneath the car and remove the plastic/rubber trim situated immediately behind the bumper on the bottom of the radiator housing that runs the width of the car. This is secured with around 8 plastic expanding plugs.
- Next, you need to remove the front bumper – this is a lot easier than you may think and makes the job a great deal simpler. Carefully prise back the plastic trim either side of the number plate. This reveals two large nuts (17mm I think) on either side, which hold the bumper assembly to two crash absorbing tubes. Loosen these off – you may need a little WD-40 as the steel/alloy combination makes for some stubborn corrosion.
- Disconnect any wiring that goes to the bumper – fog lights and temperature sensor. Tape any stray ends back out of the way to help later.

- Remove the bumper nuts completely and place to one side.
- In each of the front wheel arches there is a plastic panel running from the inner arch to the plastic bumper. It is approximately in line with the centre of the wheel towards the front of the car. No need to remove it but carefully ease the flap around the rear of the bumper where it locates – if you forget this it will prevent the bumper from sliding forwards and off the car.
- Very carefully pull the entire bumper assembly forwards 4-5 inches – you may need a little tug to start it off.
- Reaching inside the bumper, disconnect the headlamp washer pipes by unplugging the socket-type connector at the left of the bumper. Have a bucket ready as this will drain your washer system almost completely!
- Completely remove the bumper and place it somewhere out of the way.



- Next you need to remove the pressure fittings that connect the condenser to the AC circuit. These are located at the bottom left corner of the unit marked on the photo above. Mine were pretty tight and very well corroded as they tend to stay very wet. Lots of WD-40 (penetrant and lubricant) and patience required – you will need a spanner on the bottom of the fitting to support it while you turn the top collar else it will simply shear off the support bracket. Do not shear off the fitting – it is aluminium and would be difficult to remove if left in the pipework. If you have trouble, carefully try a little heat – a small blowlamp is ideal.

- Having removed the fittings, give them a little wipe down and cover the ends with tape – you want to avoid any dirt or moisture entering the system.
- Slide the large rubber grommet that supports the solid pipes as they pass through into the radiator compartment away from the hole it sits in. This will allow the pipes to move more freely away from the pressure fittings.
- Disconnect the electrical socket connector on the bottom of the electric fan.
- Open the bonnet and remove the rubber trim from along the top of the radiator.
- Carefully slide something in between the radiator and condenser to protect the radiator fins that are easily broken or damaged. I found a rectangular piece of corrugated plastic ideal, the same height but just a little narrower than the radiator.
- Remove the two screws supporting the top of the condenser – these are best accessed from the engine compartment and pass through the seam just above the condenser itself.
- Unclip the two plastic clips that secure the radiator to the same seam through which the condenser bolts passed. This allows it to slope backwards slightly aiding condenser removal.
- From beneath the car push the entire condenser up about an inch and ease the bottom of it forwards, over the metal lip at the front of the car.
- From the front of the car pull the bottom of the condenser forwards and slide the entire unit downwards and out of the car. The electric fan will rub a little on the front cross member but it will just pass if you are careful. Placing a thin sheet of plastic in between the fan centre and the cross member to save scraping it.
- Remove the electric fan from the old condenser by loosening the 3 small bolts and place to one side. It is a good idea to give it a quick test with 12 volts to check it is not seized.
- At this stage I took a break and tested my condenser by plugging one fitting and connecting the other to a hose-pipe – sure enough it was leaking from one of the welded pipe joints, corroded right through. Don't do this with your new condenser though as you will fill it with moisture and grit.



Old condenser looking a little sick – it soaks up all manner of stones and grit from the road.



Badly corroded joints in the condenser matrix pipework are a like source of a gas leak.

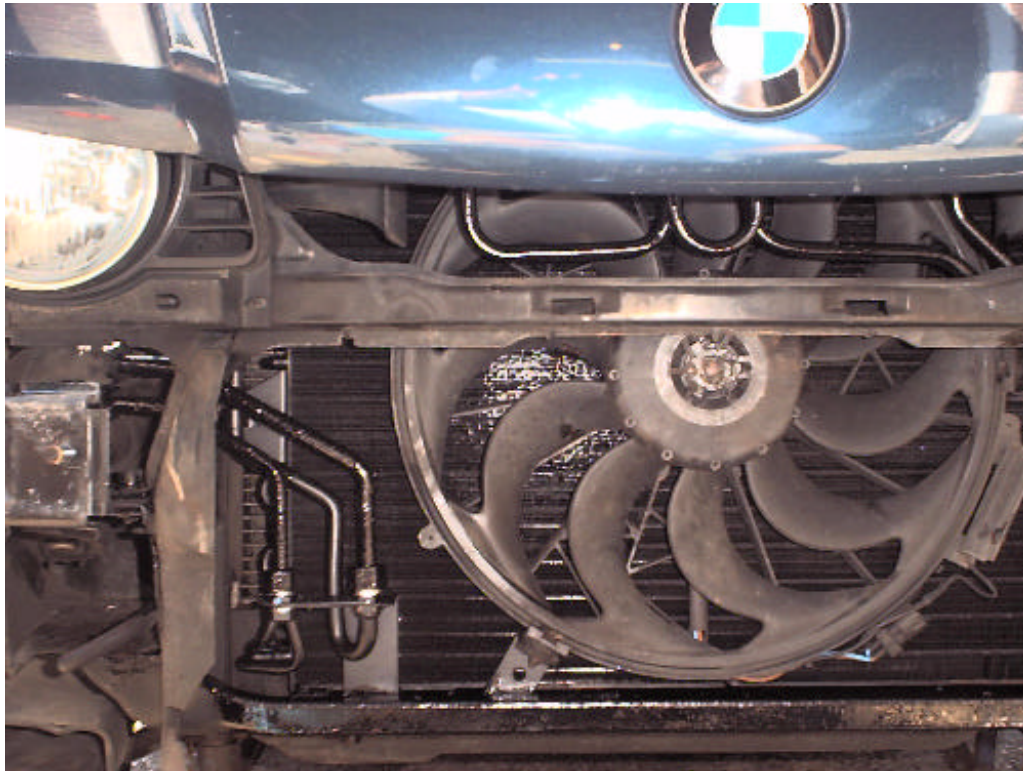
- I also took the opportunity to clean up my corroded pipework with some emery and repainting it. Makes them last a little longer and gives more protection from the elements – Plus it looked a whole lot smarter afterwards!

- My radiator also benefited from a careful wash down with a hose – it was amazing how much dirt, grit, straw, flies and even bird feathers one can contain! Best put something behind the radiator (another piece of corrugated plastic?) at this stage though to save washing all the dirt into your fan belts and electrics.
- Next, fit your electric fan to the new condenser – the electrical connector should be at the bottom right when viewed from the front.
- At this stage I slid a sheet of corrugated cardboard between the fan and the condenser. This helps to stop the solid pipe fittings from breaking the fins as you slide it past. Card is ideal as once the condenser is fitted you will not be able to remove anything solid – you can tear the card away in small sections once fitted.
- Slide the new condenser back into the car in the reverse sequence of removal. Working it past the pipe connections can be a little tricky but is possible. Remember to leave the plastic sheet you used to protect the radiator in place to save damaging it as you slide it home.
- Next you need to reconnect the solid pipe fittings. Use new o-cords and make sure that both the pipe and fitting are very clean – any corrosion or grit that enters the joint could cause a leak or damage the AC pump.
- It is useful to note that on the old condenser the aluminium threads on the fittings appeared very poor on removal. It seems that as the fitting is done up the thread is slightly oversized to ensure a gas tight joint. This does mean however, that it feels very like you have the wrong thread when tightening the joint (best check you are not on the wrong thread though!)



Poor thread condition of the old condenser fitting suggests it is cut on fitting and explains the significant effort required to tighten the joint.

- Torques (from Bentley) for fittings depend on size –
5/8in line 15ft-lb
3/4in line 29ft-lb
7/8in line 31ft-lb



New condenser fitter, pipes cleaned and painted.

- I took the opportunity to fit some additional grill behind the air intakes in the bumper and directly behind the grill to reduce possibility of getting any serious stone damage to the new condenser. If you decide do this, take care to choose a mesh that will not greatly reduce airflow else you may suffer some overheating problems!



- The remaining tasks are simply the reverse of removal – reconnect fan, remove plastic protection panel/cardboard, secure condenser bolts and radiator clips, refit solid pipe support grommet etc
- Remember to reconnect your washer hoses, foglights and temperature sensor before pushing the bumper home and securing the 4 nuts to 31ft-lb. If you have brake ducting, check this is correctly aligned before pushing the bumper fully home. The headlight trim simply pushes in and snaps into place.
- As an interesting aside once reconnected, my OBC read -22°C . After much checking of the wiring I could find no problem so decided to come back to it later. After around 3-4 hours it had slowly increased to read a normal 18°C so I can only guess that the damping in the temperature circuit is such that it takes a very long time to respond to the step change of the circuit going open and then being reconnected.
- Have a quick check to see that all of the trim outside and inside the engine bay is back in place, the condenser and radiator are secured and you removed all of the plastic protection from the radiator. Refill your washers and check the coolant system has not emptied itself since you moved the radiator a little before starting up.
- Make an appointment to have the system refilled and then enjoy your new condenser!