

**MINI cooling.doc & other tips.**  
Updated on: Wednesday, July 20, 2022

These are notes culled from various sources. I take no responsibility if you use any of them. Adds, changes or deletes are welcome to [MVPeters@comcast.net](mailto:MVPeters@comcast.net)

**MINIs don't like to idle!**

The heater is always hot - the controls divert air through (hot) or around (cold) the heater core.

Check the expansion tank cap gasket - try a little Vaseline on it.

Don't 'fill' the expansion tank – an inch or so is enough on a cold engine. Note the MIN & MAX lines on the tank. It's hard to get all the air out - open the bleed screws, one at a time, all the way, 3-4 turns, but don't drop them or you'll never see them again. You should get a steady stream of coolant. Don't let the coolant expansion tank level drop too much. Squeezing the top hose may help. Be patient.

**Other notes:**

If you plan on changing the coolant, add a good dose of dish-washer powder to the tank for a couple of days – drain & flush well with a garden hose – add fresh coolant.

Never mix coolant brands or colors. Colors are just dyes & irrelevant to the chemical makeup.

Use only glycol-based coolant in MINI systems. **Look for IAT, OAT or HOAT in the specs.** Total capacity is 1.5 US gallons or 5.7 litres.

Get 1 gallon of concentrate, use 3/4 & add your own water, distilled or de-ionized if you like.

If you get the 'ready-to-use' diluted, you'll need 1.5 gallons, it costs more & half of it is cold water!

**Display Actual Coolant Temp**

To get a better idea of the real engine temperature if you don't have the little button on the end of the stalk, you can still use the 'secret menu'.

Hold the trip reset & turn the key on - don't start the engine - trip will show >> t e s t - press the reset to 19 - trip will show >> li on off on off - when it's off, press the button to 7 = coolant temp - don't turn the key off & start the engine. Mine runs around 96C most of the time.

(option 9 = battery voltage)

& here's another version of the same thing:

1. With the key in the ignition, but in the off position, press and hold down the odometer reset button with one hand.
2. While holding the button down, switch the key in the ignition to position 1 (first click) with the other hand. The screen will have a number and the word "TEST".
3. Scroll through the numbers by pressing the odometer rest button, through to 19 and wait a moment. (Note: the number order is: 1, 2, 10, 19)
4. The message will say 19 "Li-off", flashes to "Li-on", and back to "Li-off" again. When "LI-off" appears, press the odometer rest button again.
5. You are now in the system.
6. Scroll through to 7.0 Actual coolant temp. (option 9.0 shows voltage, BTW).
7. Start the engine and go for a drive and you will see the temp fluctuations

Car should run at about 90°C-94 °C. Car moving, open road, should stay around here

Low Speed Fan (if it is triggering, which it often isn't) around 105°C, High Speed Fan should cut in at around 112°C

If you're in traffic or at very low speed, you will have heat soak due to lack of sufficient air flow over the engine, on open roads at highway speed, normal airflow should be sufficient to cool the fluid in the radiator and again you will see the thermostat open and close as required to keep the engine at its optimum operating temp.

Some more info about the fan: <https://www.northamericanmotoring.co...questions.html>

*At what temperatures does the cooling fans come on at, and, what other than temperature will make the fans come on?*

The Mini Cooper Coolant systems functions as follows;

Low speed fan switches on at 221F / 105C and the high speed switches on at 234F / 112C. When the A/C is on, the low speed switches on when the system pressure is at 116 PSI with the high speed switching on when the system pressure reaches 261 PSI. The high speed fan will run without the A/C being on if the set point of 234F

is reached. On the Gen1 car, you can see the coolant temperature inside the car – use the secret menu - (will read in Centigrade) with the set points being 105C and 112C. The cut off is 7F below the cut in. Only low and high. Low turns on at 221°F and turns off at 214°F. High turns on at 234°F and turns off at 227°F. Low speed will run whenever the AC is turned on as well. That's the easiest way of testing it. Simply start the car when it's cold, and turn the AC on. The low speed fan will kick on and stay running. If the resistor for the low speed fan is burned out, the high speed fan will toggle on and off.

Another article:

[https://new.minimania.com/R50\\_R52\\_R53\\_MINI\\_Cooling\\_System\\_Primer?fbclid=IwAR1QpPs4-M7--HdUss24fgkMcWzowhYsDk7-wsHKil3EYr8YdXQDH0A04cs](https://new.minimania.com/R50_R52_R53_MINI_Cooling_System_Primer?fbclid=IwAR1QpPs4-M7--HdUss24fgkMcWzowhYsDk7-wsHKil3EYr8YdXQDH0A04cs)

## MINI cooling temperatures

Centigrade	Fahrenheit		
80	176.0		Summer t'stat
81	177.8		
82	179.6		
83	181.4		
84	183.2		
85	185.0	Thermostat	Normal t'stat
86	186.8		
87	188.6		
88	190.4		
89	192.2		
90	194.0	Normal running	
91	195.8	Normal running	Winter t'stat
92	197.6	Normal running	
93	199.4	Normal running	
94	201.2	Normal running	
95	203.0	Normal running	
96	204.8		
97	206.6		
98	208.4		
99	210.2		
<b>100</b>	<b>212.0</b>		
101	213.8	Low fan OFF	
102	215.6	^	
103	217.4	^	
104	219.2	^	
105	221.0	Low fan ON	
106	222.8		
107	224.6		
108	226.4	High fan OFF	
109	228.2	^	
110	230.0	^	
111	231.8	^	
112	233.6	High fan ON	
113	235.4		
114	237.2		
115	239.0		
116	240.8		

### Mini Coolant System bleed:

Fill it up through a coke bottle cut in half, so the water flows in slowly  
 Then open the bleed by the thermostat till coolant comes out, and then shut it off.  
 Top up if necessary

Run it up, fan on number 2, warm but not hot, then open the bleed at the front till water comes out, then shut it off, keep the car running till it gets hot, then the thermostat will open, check the bleed at the front again making sure there's no air.

Turn it off, let it cool, check the level, and keep an eye for the next few days.

I checked there was no air with the front bleed when the car was warm a few times.

### **Heater bleeding**

To bleed, have engine cold and off. (Engine on MINI is not designed to bleed with it running/idling)

Set heater temp control to max hot.

Put heater blower fan onto lowest (first speed) setting.

Take out heater pipe bleed screw.

Top up reservoir with 50/50 coolant. Keep it topped off until coolant starts coming out in a constant stream.

While it is coming out, replace bleed screw and nip it up just tight.

Then ensure reservoir is still above minimum mark and do bleed screw in top hose the same.

Once that is flowing with constant coolant, nip that up too.

Then set the level in header tank to the max mark.

Drive the car for 20 miles. Then once it has cooled back to cold, reset level to max mark.

### **Don't 'fill' the expansion tank!**

It allows hot coolant to expand – it needs some room to do so. Only one inch of coolant is needed when cold, between the MINI & MAX marks.

### **Coolant expansion tank dip-stick!**

Genuine fake faux original replica reproduction continuation homage de-luxe JCW coolant dip-stick.



J = Just enough, C = Cool level, W = Way too much.

Only \$99.95 & there is no extra supplemental charge of any kind at all for the free shipping. Cash in unmarked, crumpled bills is preferred.

- 1 - MINIs don't like to idle!
- 2 - the expansion tank only needs an inch or so of coolant in it when cold - don't 'fill' it
- 3 - the tank cap seal is prone to deteriorate & leak
- 4 - the tank is prone to split along the seam
- 5 - it is hard to tell when the low-speed fan is on - the high-speed fan sounds like a 747
- 6 - the fan resistor is prone to fail

### **Other tips**

#### **Throttle body reset – Drive-by-wire throttle synchronization**

1. Please make sure the ignition is turned off
2. Press the gas pedal to full throttle (while ignition is off).
3. Turn on the Ignition to the 2<sup>nd</sup> position for 30 seconds (do not crank the vehicle - do not let go of the throttle)
4. After 30 seconds are over, turn the Ignition off and remove the key (do not let go of the throttle).
5. After the key is removed, let go of the throttle and wait 30 seconds.
6. After 30 Seconds, the car can now be started normally.

#### **Window limit reset**

Doors closed – Ignition on – press the window switch down & hold it for 15 seconds – press the window switch up & hold it for 15 seconds.

#### **Buying tips**

Never buy a MINI with only one key – or immediately take \$250 off the price.

Never buy a MINI without the Owners Manual – or immediately take \$50 off the price.

#### **A good online reference resource:**

<https://www.northamericanmotoring.com/forums/general-mini-talk-197/>

**Door locks** – there are lots of reports of folks unable to open cars with the remote fob because of a dead fob or car battery.

The key will always physically work in the door lock, so check that it isn't jammed/stuck/frozen/broken. A little WD40 & working the key in & out a few times will free it off. Check that it is still working once in a while.

### **Capacities**

All these capacities are approximate as a guide. Check your Owners Manual for your specific car.

Oil – 4.7 US quarts or 4.5 litres

Coolant – 1.5 US gallons or 5.7 litres.

Transmission – 1.5 US quarts or 1.4 litres

Gas tank – 13.2 US gallons or 10.9 UK gallons or 50 litres

### **Coil terminals**

It's always #3 terminal that rusts - one of MINI's little mysteries!

A little dab of di-electric grease on all the terminals will prevent it.

### **Headlight bulb upgrades for incandescent/halogen headlamps**

- Philips X-Treme H7 +120% or +150% or +200% are very effective & economical. The higher-output bulbs don't last as long as OEM, so use them in the high beams.
- Hella 500 driving lamps, Hella relay + wiring + switch kit + OEM brackets ~\$125+/-

Check the headlight alignment. Polish the hazing off the lens.



## Which MINI do I have?



## Water leaks inside the car

Common places to look:

- Sunroof drain hoses pop off & water drains onto the ECU – re-attach hoses with zip-ties, clean the ECU plugs with electronic switch cleaner, cover it with plastic.
- Windshield seals & top of 'A' pillars – re-seal with caulk.
- Radio antenna base.
- Rear hatch seals – adjust the stops on either side - adjust the lock catch. A dollar bill/5GBP note should be hard to pull out.
- License plate & hatch switch cover – re-seal with caulk or renew the gasket or replace the whole thing as the license plate lights get very corroded too.
- Rear lights – re-seal with caulk, make sure the two spring clips 'snap' home before tightening the 10mm nut. (Common severe rust spot too, wax generously).

## Frozen doors

Don't wash your car in the winter!

- Dry the door & trunk seals well.
- Wipe the seals & matching door panels with glycerin or Vaseline.
- Blow the door lock out with compressed air, use a little graphite powder on the key & work it.
- Use a hair dryer or heat gun or warm towels to melt ice – NOT hot water.

If it's all dry & clean, there's nothing to freeze.

## Exhaust leaks

Manifold > flex joint > pre-cat > catalytic converter >>>

A common break is the weld at the bottom of the pre-cat, below the flexi & above the cat. Fairly easy to weld up under the car for \$100-\$150 to keep the exhaust alignment.

A 1-piece OEM manifold etc is \$1,000+/-.

**Here is a list of all the items in the Hidden Codes on your MINI:**

- 1.0 Chassis number
- 1.1 Kilometre count
- 1.2 Parts number
- 1.3 Coding-, Diagnostic- and Bus-index
- 1.4 Production Date (Calendar week/year)
- 1.5 Hard and Software status
- 1.6 Injector status, Cylinder count, Engine factor.
- 2.0 Comb system Test
- 3.0 Service interval counter
- 4.0 Actual fuel consumption in l/100km. eg.0154 = 15,4 liters/100kms
- 4.1 Consumption in liters/100kms.
- 5.0 Distance consumption in l/100kms.
- 5.1 Actual rest distance with available fuel in Kms.
- 6.0 Actual amount of fuel in tank. eg. 123321 =12,3liters left 32,1 liters right
- 6.1 Total amount of fuel in tank
- 6.2 Show value of Fuel gauge:
  - 1= both senders OK
  - 2= sender failure
  - 3=ti signal implausible (no reading)
- 7.0 Actual coolant temp**
  - 7.1 Actual outside temp
  - 7.2 Actual engine revs
  - 7.3 Actual speed
- 8.0 Hexadecimal readings of menu 7.0 to 7.3
- 9.0 Actual on board voltage (Battery)**
  - 10.0 Land codes
  - 11.0 Unit codes
  - 12.0 No function
  - 13.0 Gong test
  - 14.0 - 14.4 On board diagnostic codes. e.g. 000000 = no failures
  - 15.0 - 18.0 No function
  - 19.0 On/Off for Test menu
  - 20.0 Correction factor for Fuel consumption Formula for correction:  
Shown consumption x 1000 / user defined consumption  
Push the trip reset button to begin the correction. Numbers count up from 0-9, when correct number shows push trip reset button.
  - 20.1 Sets 10ths for consumption factor
  - 20.2 Sets 100ths and 1000ths. For consumption factor
  - 20.3 Saves the new consumption factor and shows new value
  - 21.0 Software reset. (Same as disconnecting battery)

**Observations about LEDs.**

If you want to replace incandescent bulbs with LEDs, get canbus error-free style, these are less likely to flicker. Auxito & Morimoto seem to be good brands. You should not need to add resistors. Always put coloured LEDs behind coloured lenses or you get pink & lemon, not red & amber. LED conversions of headlights are illegal in the UK because the reflector & lens is designed for an incandescent bulb & will fail the MoT. They also provide a lot of glare & no useful light on the road. In the US, LEDs *might* work OK in projector lamps. Non-error-free LEDs may flicker at start-up. The hot & cold bulb-out checks can be coded off.

**'External' influences on LEDs**

A wall-mount AA battery charger next to a stove – when the electric spark ignites the gas, the charger LEDs flicker.

A trunk LED stays on constantly; does rear light wiring right behind it 'radiate' sufficient energy to cause this? Even if the rear lights are not on, the 'bulb-check' is still being done.

A motion-sensitive garden security light causes LED parking lights to flicker.

## MINI LED codes

I don't have the cheat sheet I used to have but it's in the FRM or BDC module.

I think these are the parameters for the front turn signals. There are three for each bulb. One to turn off cold check, one to turn off warm checks, and one to specify LEDs. I don't know if all three are required, but I know I switched all three and I don't get strobing or bulb out warnings with non-CANBUS LED bulbs.

AUSG\_22\_FRA\_VL\_IS\_LED - Change to aktiv

AUSG\_22\_FRA\_VL\_KALTUEBERWACHUNG - Change to nicht\_aktiv

AUSG\_22\_FRA\_VL\_WARMUEBERWACHUNG - Change to nicht\_aktiv

AUSG\_23\_FRA\_VR\_IS\_LED - Change to aktiv

AUSG\_23\_FRA\_VR\_KALTUEBERWACHUNG - Change to nicht\_aktiv

AUSG\_23\_FRA\_VR\_WARMUEBERWACHUNG - Change to nicht\_aktiv

## BDC Body

FRA\_V\_L\_KALTUEBERWACHUNG -> nicht\_aktiv

FRA\_V\_L\_WARMUEBERWACHUNG -> nicht\_aktiv

FRA\_V\_L\_IS\_LED -> aktiv

FRA\_V\_R\_KALTUEBERWACHUNG -> nicht\_aktiv

FRA\_V\_R\_WARMUEBERWACHUNG -> nicht\_aktiv

FRA\_V\_R\_IS\_LED -> aktiv

FRA\_Z\_L\_KALTUEBERWACHUNG -> nicht\_aktiv

FRA\_Z\_L\_WARMUEBERWACHUNG -> nicht\_aktiv

FRA\_Z\_L\_IS\_LED -> aktiv

FRA\_Z\_R\_KALTUEBERWACHUNG -> nicht\_aktiv

FRA\_Z\_R\_WARMUEBERWACHUNG -> nicht\_aktiv

FRA\_Z\_R\_IS\_LED -> aktiv

FRA\_H\_L\_KALTUEBERWACHUNG -> nicht\_aktiv

FRA\_H\_L\_WARMUEBERWACHUNG -> nicht\_aktiv

FRA\_H\_L\_IS\_LED -> aktiv

FRA\_H\_R\_KALTUEBERWACHUNG -> nicht\_aktiv

FRA\_H\_R\_WARMUEBERWACHUNG -> nicht\_aktiv

FRA\_H\_R\_IS\_LED -> aktiv

For reference – LED coding - this is for F-series cars

<https://www.northamericanmotoring.com/forums/f55-f56-hatch-talk-2014/358409-top-brake-bulb-filament-in-left-right-tail-lamp-assemblies-what-turns-it-on.html#post4608714>

## Headlights flash when indicating left or right - fault fix guide.

The flash/dip (up/down) & directional (L/R) springs are weak. A rubber band hooked with a paper clip into the air vent will help.





This is a better fix: Not sure if someone has posted this before but I couldn't find it anywhere. So in case it helps someone else here's how to repair rather than replace the indicator stalk.

Tools - T25 torx. Crosshead screwdriver. Small flat head screwdriver.

Take off the steering wheel cowl/shroud/surround. X2 torx screws on the bottom and X2 on top behind the rev counter.

Remove the screw securing the stalk, gently pry/pull the stalk off enough to rotate and remove the plug (there's a tab to be pressed on the plug) then remove the stalk.

Open the stalk base/black section on the plug side by carefully prying open the little tabs.

Gently pry off the little white plug. I wouldn't recommend pulling the wires.

Take out the screw in the middle. Carefully, keeping it level and facing you take out the circuit board.

You now need to put a slight sort of U shaped bend in the pin at the end of the white plastic bar. The aim is to make this pin come into contact with the receiving metal track slightly later. By bending the pin you essentially shorten it by a couple of millimetres meaning the stalk needs pulled slightly further to activate the main beam.

Reassemble. Test before driving.

Don't blame me if you break it.

### Exhaust leaks

Check the weld at the bottom of the pre-cat, below the flex, above the cat. It's a common breakpoint & not too hard to weld up on the car to preserve the exhaust alignment.

### Door panel screw covers

Lowe's have them They are flat-pack furniture screw covers. You'll need 3 per door 5/8". \$2 or \$3 per packet. UK - try HomeBase or similar.

[https://www.youtube.com/watch?v=OwzyvgZwh8M&ab\\_channel=tweedbean](https://www.youtube.com/watch?v=OwzyvgZwh8M&ab_channel=tweedbean)

### Low oil pressure warning light

If the light flickers at idle on a high-mileage engine, you might try a 5W40 or 10W40 oil.

OEM filters from MINI are not expensive.

There is a fragile anti-drain-back valve in the filter housing base. If it breaks, the MINI solution is to replace the entire housing for \$400+ Here are two alternatives:

Dorman 904-261 \$10-\$15 - [https://www.autozone.com/external-engine/engine-oil-drainback-valve/p/dorman-engine-oil-drainback-valve-904-261/558918\\_0\\_0](https://www.autozone.com/external-engine/engine-oil-drainback-valve/p/dorman-engine-oil-drainback-valve-904-261/558918_0_0)

or [https://www.outmotoring.com/MINI-Cooper-R50-R52-R53-oil-filter-housing-drain-plunger-spring-repair-kit-rep\\_12345.html?cat=0](https://www.outmotoring.com/MINI-Cooper-R50-R52-R53-oil-filter-housing-drain-plunger-spring-repair-kit-rep_12345.html?cat=0)

### Battery & grounds

Clean all power and ground cable ends and the mating surfaces on the car chassis to which these cables connect. By clean, I mean remove the oxidation to expose shiny metal using a file (sandpaper might also work) on both sides of the cable ends and anything it will come into contact. There may be gentler ways to do this.

This is important as some of the surfaces may look "ok" but can have a film of contaminant that limits the electrical current.

**List of cables/ends/chassis points.** Most are attached with a **13mm** nut. **19mm** socket is needed for positive post.

1. Under the hood, passenger (right) side.

a. **Black ground cable (passenger side).** connects to engine and chassis.

2. Under the hood, drivers (left) side.

- a. **Positive terminal post** (located under a 2"x2" square plastic cap, attached to the side of the air filter box); the **Post is a 19mm "nut"**. Remove the nut and clean the bottom of it.
- b. **Metal strip inside the terminal box.**
- c. **2 positive cable ends** attached to the post. Clean both sides of each end.
- 3. *Battery cubby, trunk. Remove the battery to gain access to all power cables. Open the power junction box, located on passenger side of battery box, and remove the 3 13mm nuts.*
- a. **Battery - positive and negative posts. Use a wire brush to clean them.**
- b. **Black ground cable, left side**
- c. **Red cable 1 - connects to positive battery post**
- d. **Red cable 2 - connects to red cable 1's battery terminal 1 by a 13mm nut. The other end connects to the**
- e. **Red cable 3 - connects to power junction box**
- f. **200AMP fuse.**
- g. **Metal bridge/connector, about 1.5 inch long.**

A wipe of all contact points with di-electric grease will delay corrosion.  
 Auto Store replacement battery catalogs may not be correct; eg the R53 takes an H6 size, not the H5 often listed.

**Battery cables**

- X ---- X battery negative to body ground – black – in the trunk
- X ---- ---- ---- X battery positive in the trunk to jumper terminal under hood - red
- X ---- ---- X jumper terminal to alternator – red
- X ---- X body to engine ground – by the right side engine mount - black

**BMW Mini Generation 1 (Gen 1) MODEL RANGE EXPLAINED:**

- R50 – HATCHBACK – Mini One / Cooper – 1.6 Petrol W10 Engine – 2001 – 2006
- R52 – CONVERTIBLE – Mini One / Cooper – 1.6 Petrol W10 Engine – 2002 – 2008
- R52 (S) – CONVERTIBLE – Cooper S (Supercharged) – 1.6 Petrol W11 Engine 2002 – 2008
- R53 – HATCHBACK – Mini Cooper S (Supercharged) – 1.6 Petrol W11 Engine – 2002 – 2006

**Distinguishing between Generation 1 (Gen 1) Pre-Facelift & Facelift BMW Mini Models:**

**Pre-Facelift - Pre-July2004,** Has a single central clear reversing light in the rear bumper.

**Facelift - Post-July2004,** Has small circular clear reverse light in both of the rear corner light clusters and single central RED reflector or rear fog light (an option) in the rear bumper.

So 2002 - July 2004 = Gen1 pre-facelift

July 2004 - 2006 = Gen1 facelift

**Distinguishing between Generation 1 (Gen 1) and Generation 2 (Gen 2) BMW Minis:**

Generation 1 (Gen 1) - Has a normal Ignition Key, and the Headlights attached to bonnet so when bonnet opened, headlights point to the sky.

Generation 2 (Gen 2) - Has a Circular Keyless Ignition Fob, and the Headlights attached to car body so when bonnet opened, you have two holes in bonnet where the headlights were.

**Note:** 99% of Gen 1 Mini parts will **NOT** fit the Gen 2 Mini.

**Identifying which side of the car the part is for:**

Assumes you are sitting in the Driver's Seat of a UK Right Hand Drive Car:

Drivers Side = Right Hand Side = RHS = Off Side = OS = O/S

Passenger Side = Left Hand Side = LHS = Near Side = NS = N/S

Last updated on Wednesday, July 20, 2022

Notes from various MINI forum contributors are acknowledged with thanks.

Corrections, additions, suggestions or updates to this doc are welcome – Mike – [MVPeters@comcast.net](mailto:MVPeters@comcast.net)