NISSAN CG COOLANT SYSTEM

This document outlines the basic requirements for the Nissan CG engine cooling system and additional plumbing when fitted to an Austin Healey Sprite / MG Midget.

The designs and systems outlined may have to be altered depending on the individual build specification.

Note that the Nissan engine does not have a mechanically driven fan. An electric fan is required with this installation.

MAIN COOLING CIRCUIT

The main circuit uses 1" / 25.4mm I/D hose, as per the original A-Series installation.

Coolant Outlet

Coolant exits the engine through the thermostat housing on the back of the cylinder head. This should be routed forward to the top of the radiator. This can be neatly achieved using a 45˚ and 90˚ hose elbows and a length of stainless steel tube. A P-clip is advisable to securely locate the pipework to the engine.
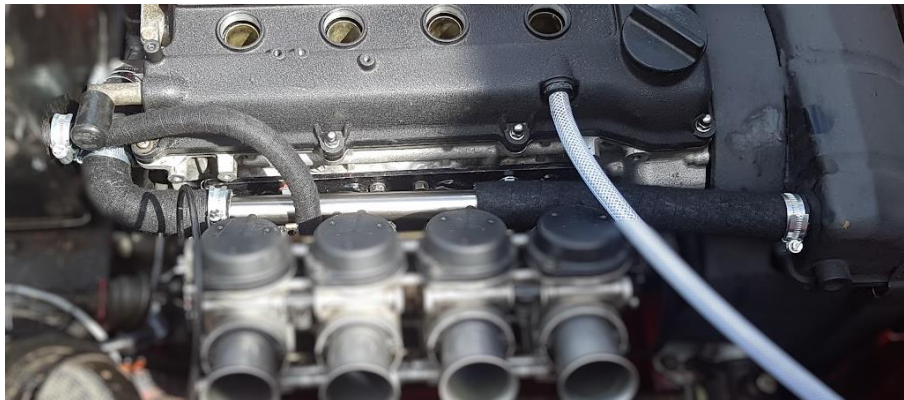

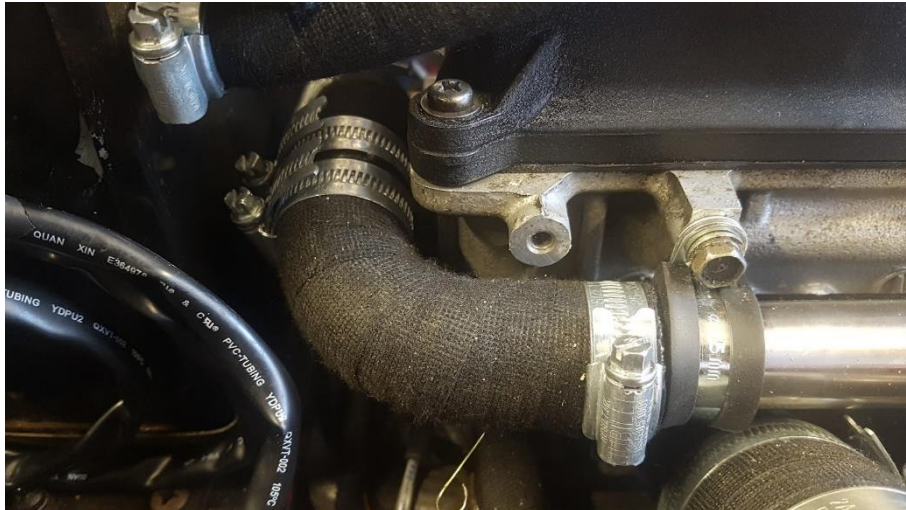*FIGURE 1: COOLANT OUTLET, EARLY RADIATOR*

Figure 2: Note P-Clip

Alternatively, a hard pipe can be fabricated. This works well for later 1275 crossflow radiators

FIGURE 3: COOLANT OUTLET, LATE TYPE RADIATOR

Coolant Return

Coolant returns from the bottom of the radiator and feeds into the water pump.

Early / Vertical Flow Radiator

A cut down and blanked CG water rail and an A-Series top and bottom hose to route the coolant behind the engine. A length of hose or pipe can then be used to link to the radiator. It is advised that the o-ring on the water rail is replaced. Nissan P/N 21049-2J200.
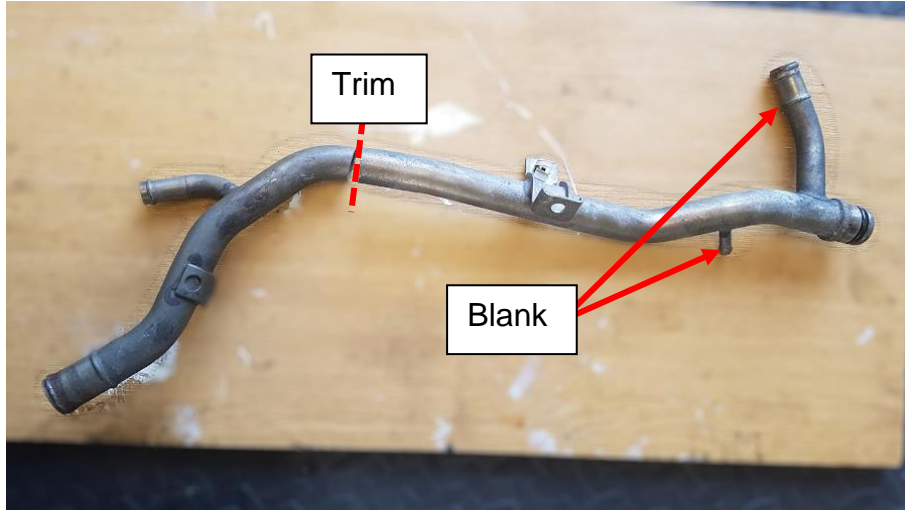

FIGURE 4: WATER RAIL MODIFICATION

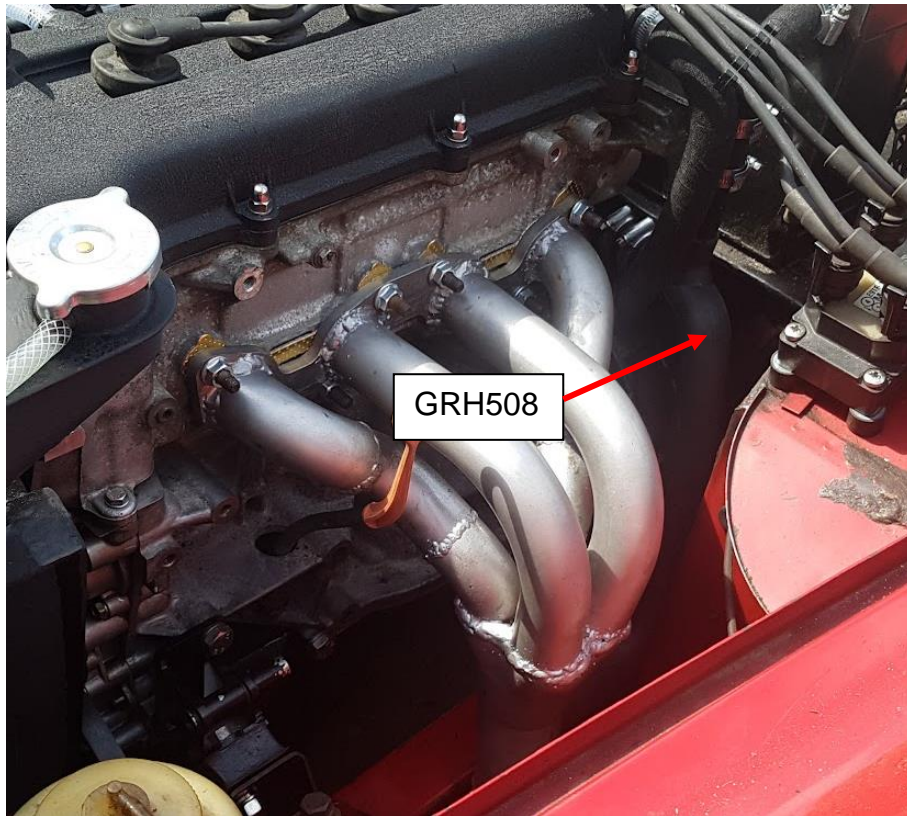FIGURE 5: EARLY MIDGET HOSES LINKED TO RUN BEHIND ENGINE

BARRATT ENGINEERING

FIGURE 6: GRH508

Late / Crossflow Radiator

The O-Ring carrier of the Micra water rail can be removed and welded to a 25mm 180 degree bend. This will direct coolant directly from the bottom outlet of the radiator into the water pump. A retention bracket is required.

A return from the heater can also be taken from this pipe.

Bypass

A small quantity of coolant must be allowed to flow even when the thermostat is closed to ensure no local hotspots are formed in the cylinder head and to ensure that heated coolant is passed over the thermostat.

Bypass coolant is taken from the side of the cylinder head using the BSP hose-tail provided.

Note that CGA3DE and late CG10DE may be missing this drilling from the factory. If this is the case the head should be drilled to accept the 1/4BSP threaded hose-tail.
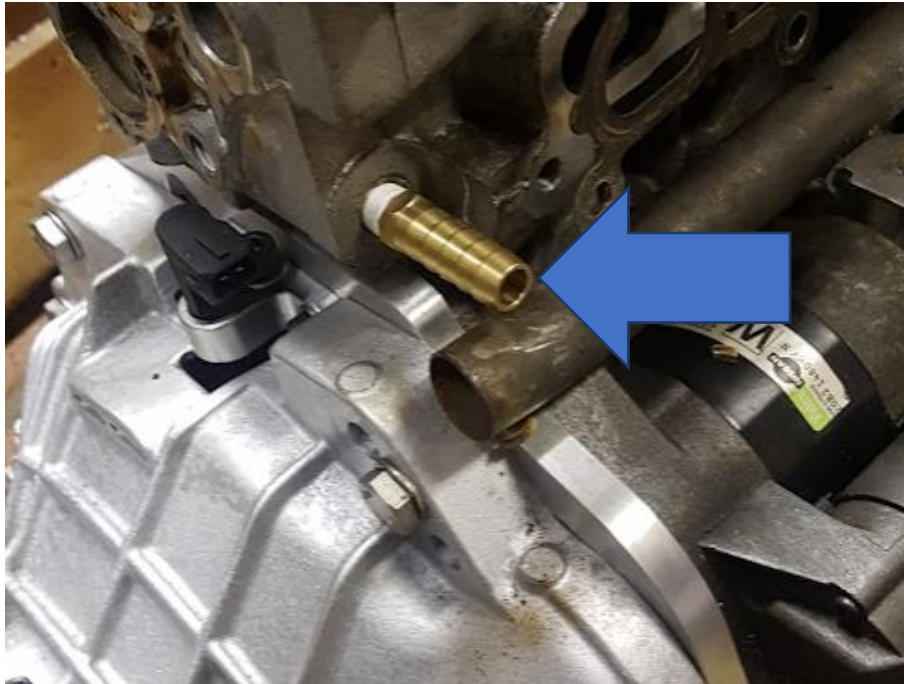

FIGURE 7: BYPASS OUTLET

The bypass circuit can be plumbed directly into the heater matrix and returned to the coolant return line

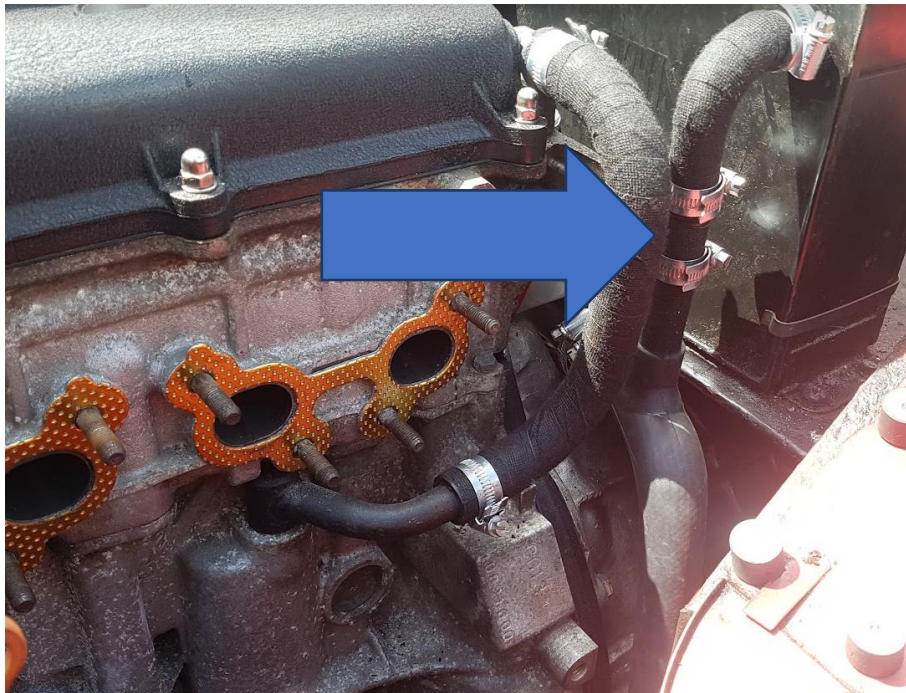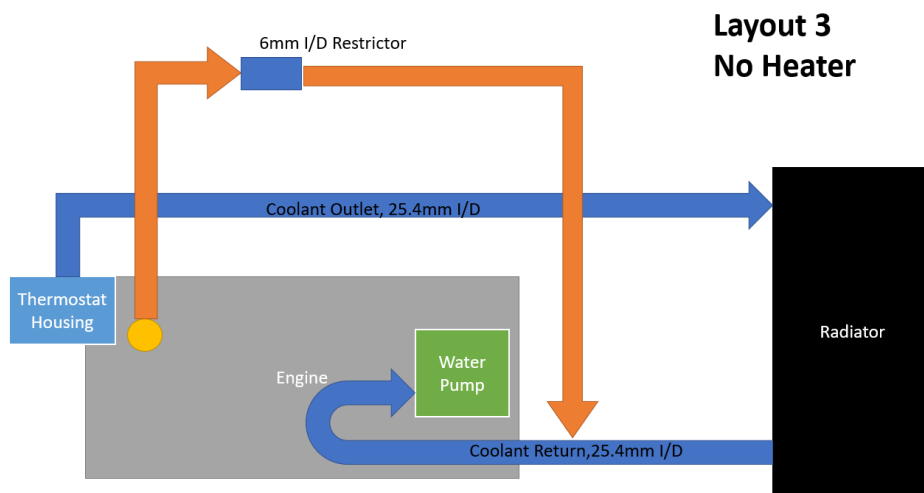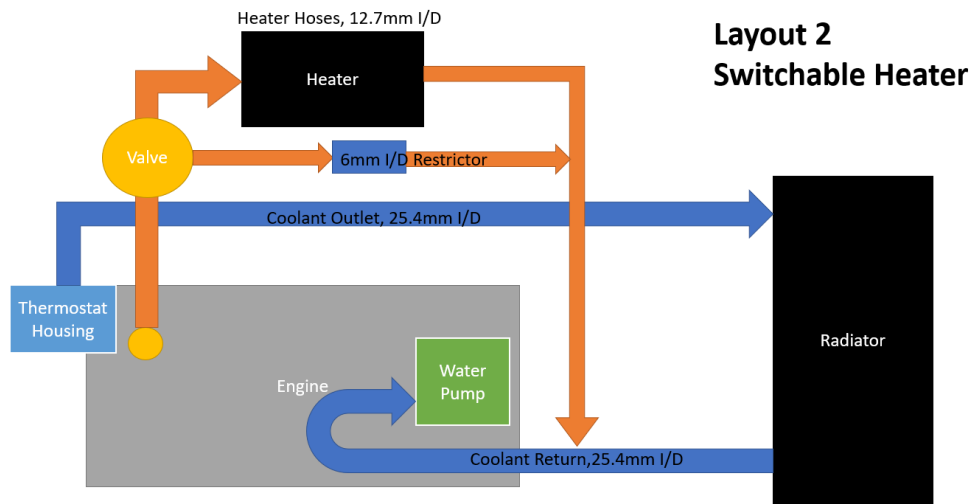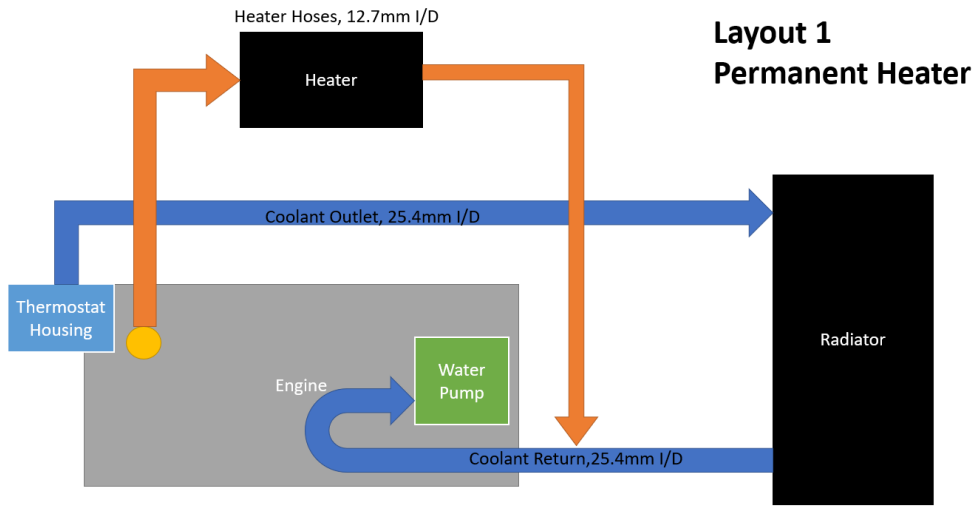*FIGURE 8: BYPASS INTO HEATER MATRIX*

FIGURE 9: LINK FROM HEATER TO RETURN HOSE

If the heater matrix is not being used the bypass should be restricted to 6mm ID to ensure adequate coolant flow is directed through the radiator with the thermostat open.

Heater Hoses, 12.7mm I/D

Heater

Layout 1
Permanent Heater

Coolant Outlet, 25.4mm I/D

Thermostat Housing

Radiator

Engine

Water Pump

Coolant Return, 25.4mm I/D

Heater Hoses, 12.7mm I/D

Heater

Layout 2
Switchable Heater

Valve

6mm I/D Restrictor

Coolant Outlet, 25.4mm I/D

Thermostat Housing

Radiator

Engine

Water Pump

Coolant Return, 25.4mm I/D

6mm I/D Restrictor

Layout 3
No Heater

Coolant Outlet, 25.4mm I/D

Thermostat Housing

Radiator

Engine

Water Pump

Coolant Return, 25.4mm I/D

SENDERS

The CG engine has two coolant temperature senders in the back of the cylinder head.

Either can be used for controlling fan functions etc in an ECU or to run a suitably calibrated gauge.

Early cars with the capillary in the radiator can be left unaltered. For later cars with the capillary in the head it is advised that the radiator is modified with a suitable plug near the top hose to accept the capillary. Alternatively one of the senders can be removed and re-tapped to suit.

Oil pressure is read from the side of the block. The thread is 1/8-28 BSPT.

Coolant Sender Calibration

2 pin sender (ECU signal in Micra)

M12x1.5

2263071L00

Engine temperature sensor	
Resistance:	
20°C	2.5 k ohms (approx)
50°C	0.85 k ohms (approx)
90°C	0.25 k ohms (approx)

1 pin sender (gauge signal in Micra)

M12x1.25

2508070J00

Engine temperature gauge sensor	
Resistance:	
52.5°C	2100 ohms
65°C	1175 to 1420 ohms
91°C	470 to 570 ohms
119°C	210 to 235 ohms

Coolant

Only IAT 'blue' coolant should be used.

Capillary Gauge Senders

For vehicles originally fitted with a capillary gauge threaded into the cylinder head we advise that the radiator or top hose be modified to accept the sender. Take care to not restrict coolant flow if mounting into hoses.