Stag cooling system mods

By James Ostergaard
Mods performed include:

- Overflow bottle replaced by expansion bottle.
- Davies, Craig EWP115 Electric Water Pump fitted.
- EWP/Fan Digital Controller fitted.
- Removed original fan & fitted a Davies, Craig 16” Thermatic electric fan.
- Air bleed on rear of right hand head.
- Air gaps around radiator blocked off.
- Air flow blocked inside the front guards.
Basics first

- Flush radiator & remove residual casting sand from the block
Overflow bottle replaced by expansion bottle.

- Discard old overflow bottle & cut off the bracket.
- Install new expansion bottle at the highest point under the bonnet.
- New expansion bottle has a level sensor.
Remove the old overflow bottle
New expansion bottle

Price from VW
$57.62
In June 08
Expansion bottle mounted high
Easy to see coolant level
1.5 Bar Pressure cap (21.75 psi)

Price
from VW
$19.42
In June 08
Electric water pump & digital controller.

- The Electric Water Pump takes the place of the original Stag water pump, and does a much better job.
- EWP/Fan Digital Controller runs the EWP in pulse mode until the engine reaches operating temp.
- EWP/Fan Digital Controller runs EWP after engine shut down to prevent heat soak.
- EWP/Fan Digital Controller operates the Thermatic electric fan.
EWP115 Electric Water Pump & Digital Controller. (DIY kit)
Remove Stag pump & keep housing

Price
From Triumph spares
12 vane $300
Housing $150 in June 99
Plug water pump holes

Use Welch plugs
2 plugs required
1 x 43mm aprox.
1 x 45mm aprox.
Remove original thermostat

- The EWP/Fan Digital Controller replaces and becomes the new ‘thermostat’.
Remove original thermostat
Block off original bypass

- The Digital Controller unit takes over the job of the bypass.
- If the bypass is no blocked, hot coolant will circulate constantly & may cause overheating.
Block off original bypass
EWP location in a Stag

- The EWP115 needs to be mounted as low as possible in the system.
- The Electric Water Pump was fitted into the bottom radiator hose & rests where the original overflow bottle was removed.
EWP location in a Stag
Holden V6 hoses may be useful

Price
from Burson
$13.18 ea.
Heater return on suction side of pump

- A “T” piece was fabricated from stainless to make the heater work properly.
Heater return on suction side of pump
Controller mounted in glove box

- Controller mounted in the glove box to preserve the original look of the interior.
- No cutting of the glove box was required.
- Wiring to Controller passes through an existing hole.
- Easy to get to for adjustment & observation.
Controller mounted in glove box
EWP warning LED

- The Electric Water Pump Controller warning light was installed into the middle of the warning light cluster, preserving the original look of the dash.
EWP warning LED
Original fan & viscous coupling

- Original fan, cowling & coupling is removed and replaced with a Davies, Craig Thermatic Fan 16” on the front of the radiator to increase air flow in traffic.

- This mod will increase horsepower & economy also.
Original fan & viscous coupling removed
Davies, Craig Electric Fan 16 inch.
Fan with brackets

- Fan brackets were fabricated to easily remove & refit the fan assembly in the vehicle.
- Brackets were also used because this size electric fan has the kick of a mule when it comes on.
Fan with brackets
Air bleed on the back of RH head

- Tap a thread for a hose union into the plate at the back of the right hand head, and run a hose to a “T” in the heater hose or to the top radiator hose.
Air bleed on the back of RH head
Block up air gaps around radiator

- Void area in the front wings were blocked with foam rubber, trimmed to the correct shape.
- Air gaps around the radiator were blocked up with 60mm x 3mm strips of rubber, glued to the radiator tanks.
- These mods force air through the radiator rather than around it.
Block up air gaps around radiator
Use a high quality coolant

Price
from VW
$10.94 ea
In June 08
Boiling point of coolant

- With a 50% mix raises the boiling point for this cooling system up to 145°C.
Boiling point of coolant

<table>
<thead>
<tr>
<th>Percentage of cooling system capacity</th>
<th>Protects from:</th>
<th>Boiling up to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freezing down to:</td>
<td></td>
</tr>
<tr>
<td>33.3%</td>
<td>0°F (-17.8°C)</td>
<td>220°F (104.4°C)</td>
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<tr>
<td>40%</td>
<td>-12°F (-24.4°C)</td>
<td>222°F (105.6°C)</td>
</tr>
<tr>
<td>50%</td>
<td>-34°F (-36.7°C)</td>
<td>226°F (107.8°C)</td>
</tr>
<tr>
<td>60%</td>
<td>-62°F (-52.2°C)</td>
<td>231°F (110.6°C)</td>
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</tbody>
</table>

Note:
Boiling points at sea level with no system pressure. Boiling points increase by 3°F (1.7°C) for each pound of pressure (PSI) (0.07 bar) maintained by the cooling system pressure cap. A 21³⁄₄psi (1.5 bar) pressure cap raises boiling point by approx. 65°F (37°C).