

## **NISTUNE TECHNICAL BULLETIN #002**

### **TITLE : Correction of ECU Air Flow Meter modifications**

**Models covered: CR31 RB30E, VLT RB30ET, Z31 VG30E/ET (1986-1987)**

**Date: 25 September 2009**

#### **Introduction**

These ECUs contain opamp circuitry on a mini circuit board which is fitted near the AFM input. Part of the circuitry converts the AFM output voltage from a 1.5 - 6.5 volt range to a standard TTL 0 - 5.12 volt range accepted by the ECUs HD46510 Analogue to Digital converter.

Previous modification instructions inside the Type 1 Hardware Installation Manual have documented that the opamp circuitry be bypassed and a 5 volt zener diode fitted as protection against voltage spikes.

Following this modification it has been noticed during field testing that logs have indicated that 0 and 5 volt spikes in the AFM signal received by the HD46510 chip have been received and processed as can be seen below:



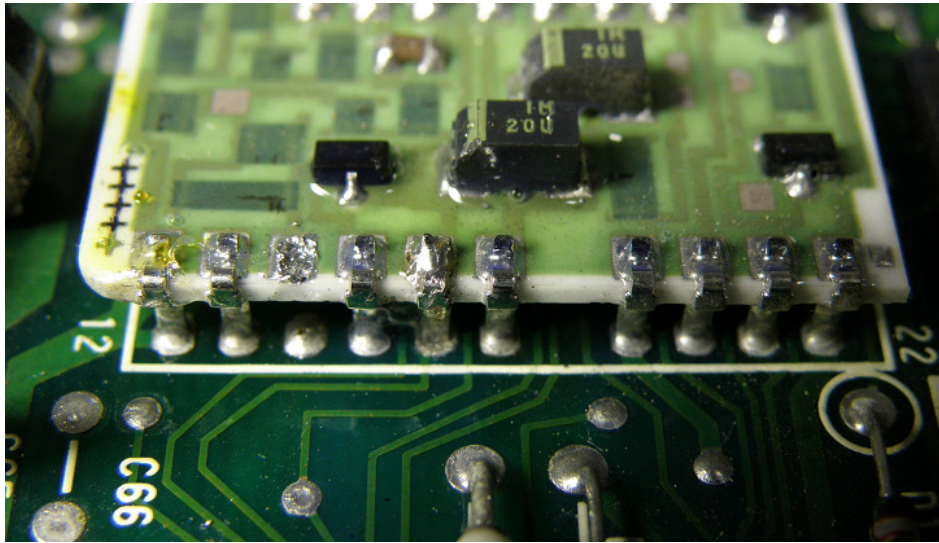
The removal of the opamp from the circuit has affected filtering of the ECU and occasional spikes in the fuel injection could be potentially noticed. In the log above TP was not affected, so the map points accessed were not changed.

One of our forum members has been researching the circuitry further investigating an alternative solution. He has found that by removing an 8 volt input signal from the opamp negative input that the existing circuitry can still be used without the original 1.5 volt drop.

What this means is that there is a simpler and better solution to the previous document AFM modification for these ECUs.

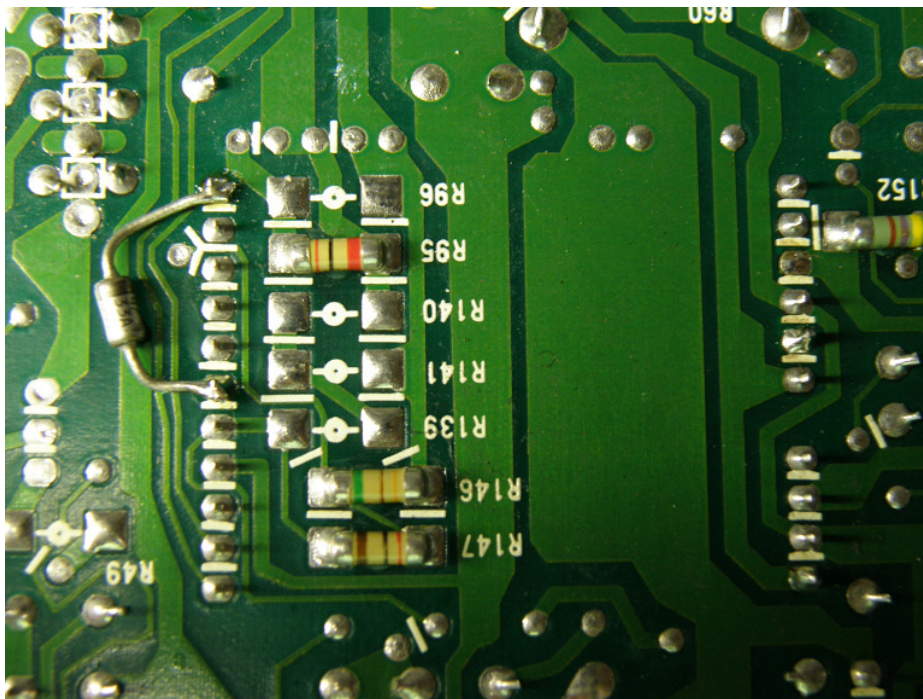
## Modification Required for new ECUs

1. Remove pin 14 from the omp amp board (this is two pins up from pin 12 marked at the end)



2. Using a zener diode is still recommended as the opamp may not protect against over voltage from the AFM if it occurs. It will need to be moved to the input side of the ECU

Solder the banded end of the zener diode to pin 11, and the other end to pin 6 as pictured below.



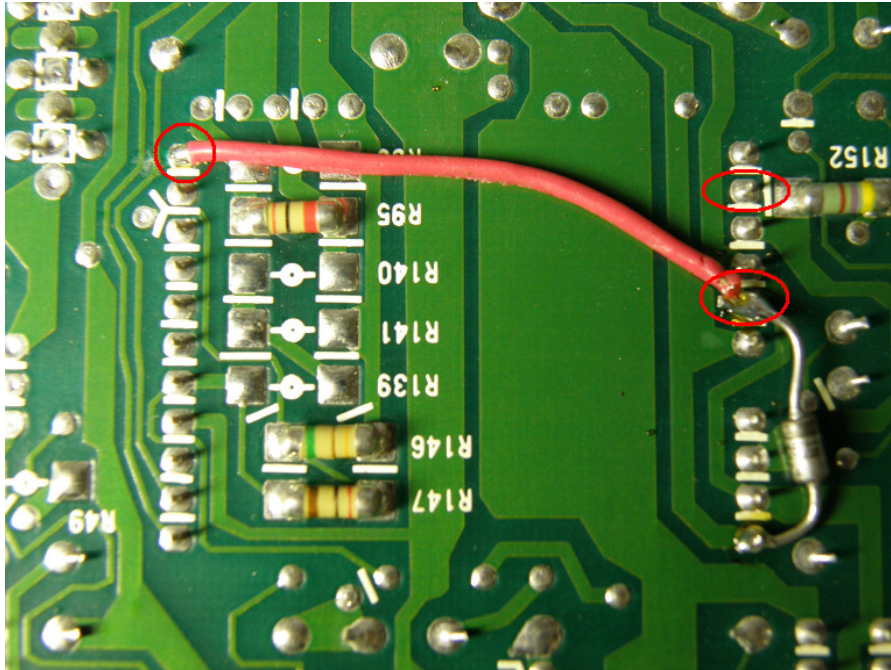
3. Reinstall the ECU and as a test you can measure pin 11 and pin 16 with a voltage meter against ground to check they measure approximately the same voltage.



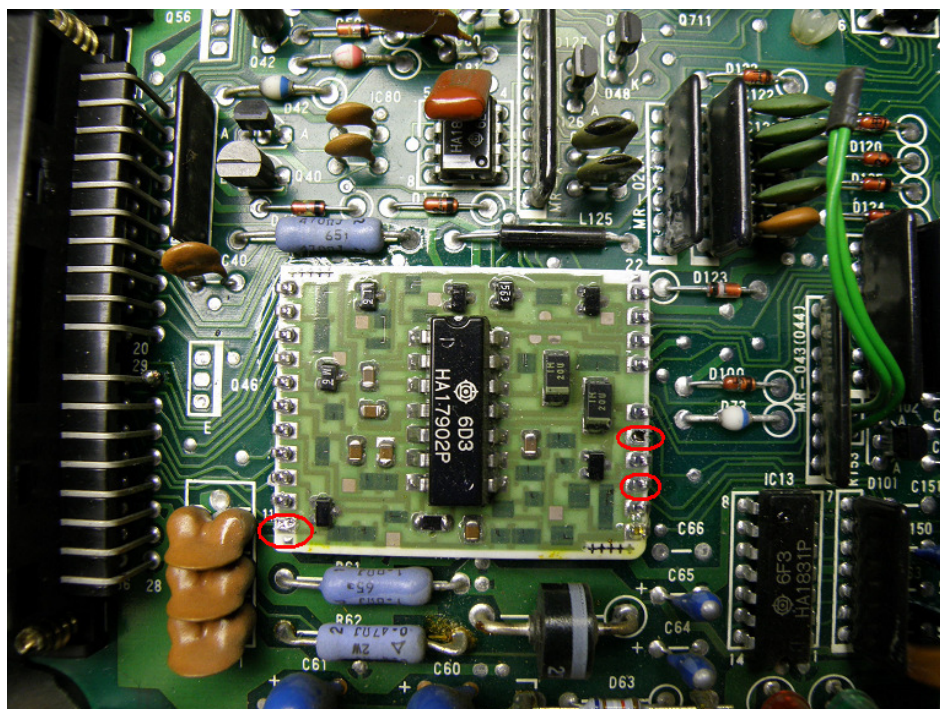
## Reversal of Modification for existing ECUs

The following steps detail the reversal of the previous modification required and the steps to perform the updated modification.

1. On the reverse side of the ECU desolder and remove the installed wire jumper and zener diode
2. Desolder the holes which are highlighted by the red circles in the diagram

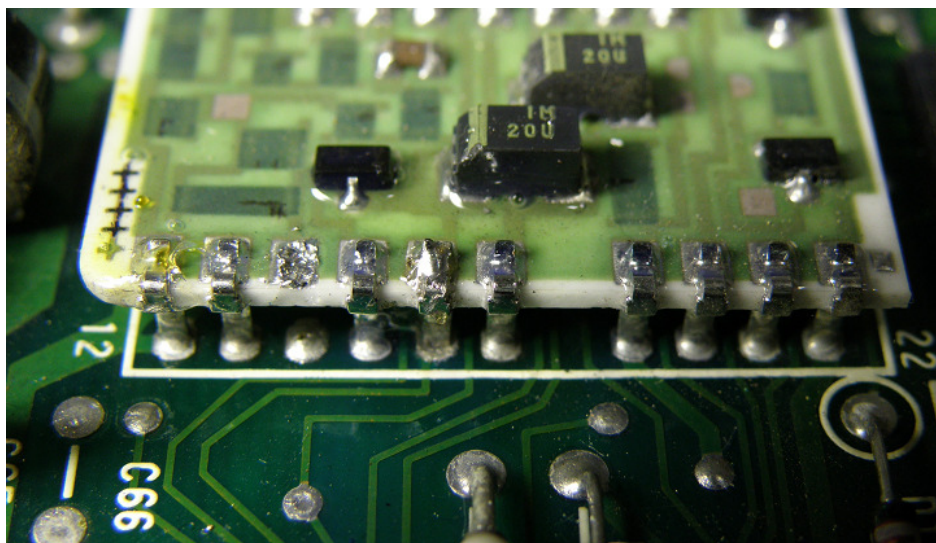
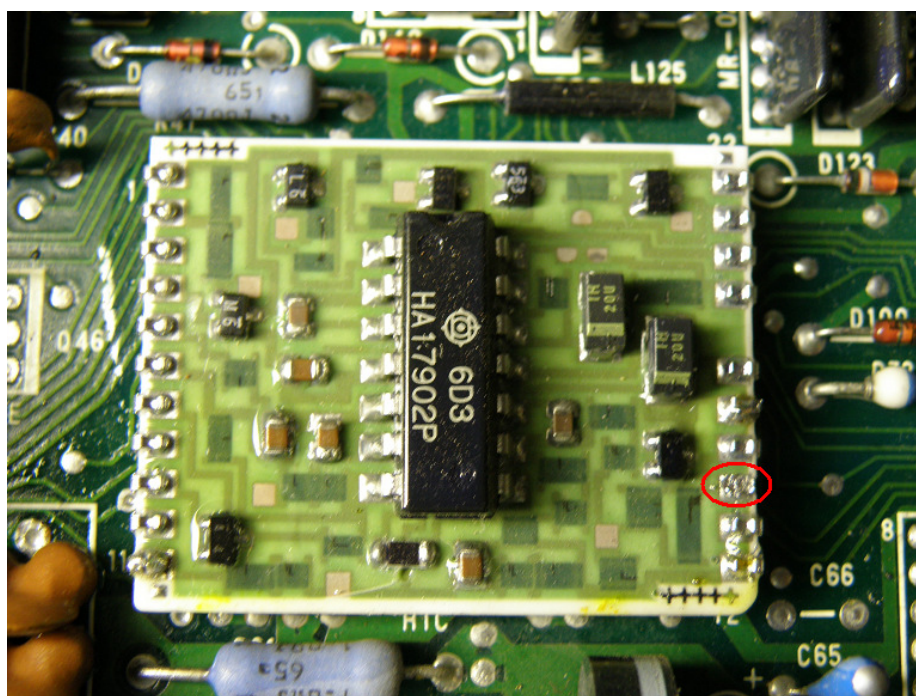


3. Remove Pin 14 (lower RHS) from the board and move to previously removed Pin 16 (upper RHS) and solder in. Reinstall Pin 11 (lower LHS) to the board using jumper wire or similar.



*Note: Silkscreen on the circuit board shows pins 1 ..11 LHS and 12 .. 22 RHS*

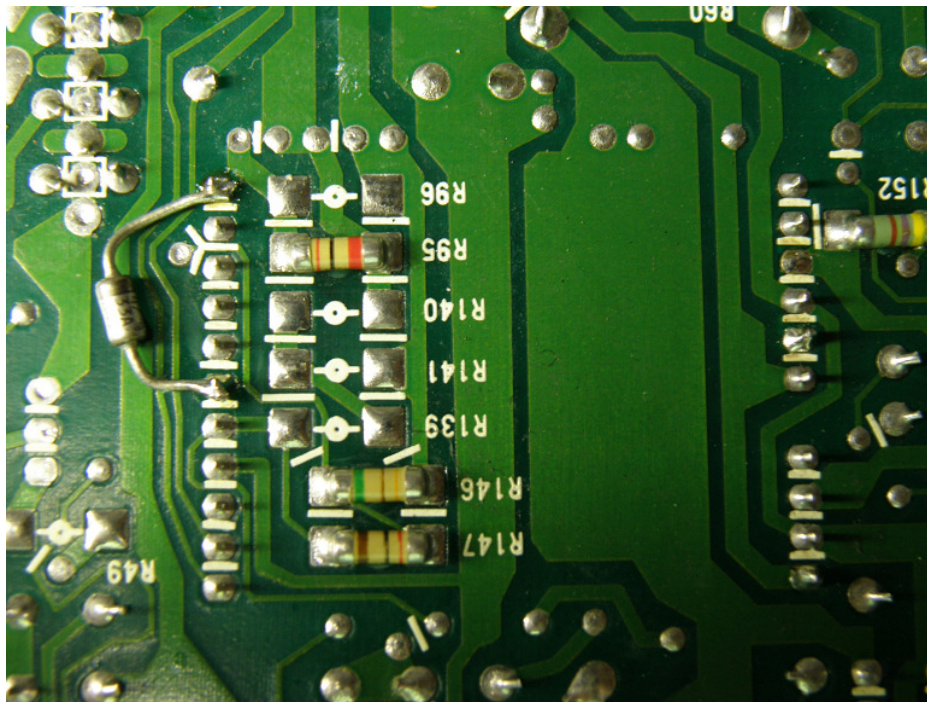
4. Now the circuit board should look like the picture below. Both pin 11 and pin 16 have been resoldered and pin 14 (highlighted) is now removed





5. Retaining the zener diode is still recommended, as the opamp may not protect against over voltage from the AFM if it occurs. It will need to be moved to the input side of the ECU

Solder the banded end of the zener diode to pin 11, and the other end to pin 6 as pictured below.



6. Reinstall the ECU and as a test you can measure pin 11 and pin 16 with a voltage meter against ground to check they measure approximately the same voltage.