The heated oxygen sensor is screwed into threaded mountings welded into the top of the front exhaust pipes at suitable locations. They are used to detect the level of residual oxygen in the exhaust gas to provide an instantaneous indication of whether combustion is complete. By positioning sensors in the stream of exhaust gases from each separate bank of the exhaust manifold, the engine management system is better able to control the fuelling requirements on each bank independently of the other, so allowing much closer control of the air:fuel ratio and optimising catalytic converter efficiency.

Two pre-catalytic converter heated oxygen sensors are mounted in the front pipes for monitoring the oxygen content of the exhaust gas. NAS models also have two additional post-catalytic converter heated oxygen sensors in the exhaust front pipe.

CAUTION: HO2 sensors are easily damaged by dropping, over torquing, excessive heat or contamination. Care must be taken not to damage the sensor housing or tip.

The oxygen sensors consist of a ceramic body (Galvanic cell) which is a practically pure oxygen-ion conductor made from a mixed oxide of zirconium and yttrium. The ceramic is then coated with gas-permeable platinum, which when heated to a sufficiently high temperature (≥ 350° C) generates a voltage which is proportional to the oxygen content in the exhaust gas stream.

The heated oxygen sensor is protected by an outer tube with a restricted flow opening to prevent the sensor's ceramics from being cooled by low temperature exhaust gases at start up. The post-catalytic sensors have improved signal quality, but a slower response rate.

The pre-catalytic and post-catalytic converter sensors are not interchangeable, and although it is possible to mount them in transposed positions, their harness connections are of different gender and colour. **It is important not to confuse the sensor signal pins; the signal pins are gold plated, whilst the heater supply pins are tinned, mixing them up will cause contamination and adversely affect system performance.**

Each of the heated oxygen sensors have a four pin connector with the following wiring details:

- Sensor signal ground (grey wire – connects to engine management ECM)
- Sensor signal (black wire – connects to engine management ECM)
- Heater drive (white wire – connects to engine management ECM)
- Heater supply (white wire – connects to fuse 2, underbonnet fuse box)

The ECM connector pins for exhaust emission control are listed in the following table:

ECM Connector 2 (C635) pin-out details for exhaust emission control system

Pin Number	Function	Signal Type	Control
2-01	Post-cat sensor heater (RH) - NAS only	Output, Drive	PWM, 12 - 0V
2-07	Post-cat sensor heater (LH) - NAS only	Output, Drive	PWM, 12 - 0V
2-08	Post-cat sensor (RH) - NAS only	Ground, Signal	0V
2-09	Pre-cat sensor (LH)	Ground, Signal	0V
2-10	Pre-cat sensor (RH)	Ground, Signal	0V
2-11	Post-cat sensor (LH) - NAS only	Ground, Signal	0V
2-13	Pre-cat sensor heater (RH)	Output, Drive	PWM, 12 - 0V
2-14	Post-cat sensor (RH) - NAS only	Input, Signal	Analogue, 0 - 1V
2-15	Pre-cat sensor (LH)	Input, Signal	Analogue, 0 - 1V
2-16	Pre-cat sensor (RH)	Input, Signal	Analogue, 0 - 1V
2-17	Post-cat sensor (LH) - NAS only	Input, Signal	Analogue, 0 - 1V
2-19	Pre-cat sensor heater (LH)	Output, Drive	PWM, 12 - 0V

The heated oxygen sensors should be treated with extreme care, since the ceramic material within them can be easily cracked if dropped, banged or over-torqued; the sensors should be torqued to the recommended values indicated in the repair procedures. Apply anti-seize compound to the sensor's threads when refitting.

WARNING: Some types of anti-seize compound used in service are a health hazard. Avoid skin contact.

WARNING: To prevent personal injury from a hot exhaust system, do not attempt to disconnect any components until the exhaust system has cooled down.

CAUTION: Do not allow anti-seize compound to come into contact with tip of sensor or enter exhaust system.

NOTE: A new HO2 sensor is supplied pre-treated with anti-seize compound.