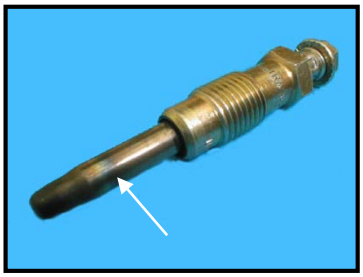
Glow Plugs

Fault Finder

"Ultra-glow" diesel heat plugs visual fault finding chart

All "ultra-glow" diesel heat plugs undergo a 100% circuit test before being released for despatch. Every single glow plug has to pass a functional time and thermal test controlled by an optical pyrometer. It is thus unlikely that circuit / plug failures would occur due to faulty manufacture. Like most engine components that fail there are always visual features which will indicate the cause of the problem. The following chart indicates typical glow plug features to help you analyse any possible failures.

PROBE SURFACE IS CLEAN BUT EXHIBITS RAINBOW TEMPERING COLOURATION HIGH UP THE BLOW TUBE.



Common cause

(1) Starter boosting & jump starting.

(2) Over active timer relay.

(3) Over active alternator & regulator

Resulting failure

(1) Glow plugs are subjected to an excessive voltage which causes the filament to melt to open circuit. Note! Failure would be immediate.

(2) Glow plugs are powered beyond the normal time cycle which reduces the plug life span.

(3) Excessive voltage leading to filament melt and open circuit. Note! Failure would not be immediate.

PROBE TIP IS SWOLLEN / BALLOONED

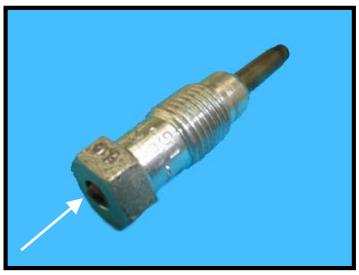
Common cause

Presence of water moisture within probe.

Resulting failure

Expansion of moisture within probe which becomes gaseous and balloons probe tip & leads to ultimate circuit break. Can result after long term parking or due to storage of new stock in damp conditions.

SHEARED GLOW PLUG TERMINAL CONNECTION



Common cause

(1) Excessive tightening of retainer. Fitters should use a dedicated "screwdriver - torque driver".

(2) Mishandling causing breakage of terminal pin.

Resulting failure

Fitters do not necessarily realise that they have sheared the internal conductor pin. The plug may operate for some time until the sheared parts separate due to arcing and heat expansion. Failure will then be immediate.

PROBE IS COATED IN A ROUGH LAYER OF RAISED CARBON

Common cause

Ingress of oil due to wear via piston rings and / or valve guides

Excessive fuelling due to worn diesel pump or worn injectors.

Resulting failure

Plug probe becomes layered with carbonised fuel / and or oil. The probe can no longer dissipate heat and thus probe core and filament overheat to the point of malfunction.

Note! Failure would not be immediate and might not affect all plugs.

PROBE IS COATED IN A LIGHT SMOOTH COAT OF SOOT OR "BEIGE" COLOURED SCALE.

Common cause

Under fuelling due to diesel pump or inefficient injector spray.

Resulting failure

Plug environment is subjected to overheating due to a weak mixture.

Constant non operation overheat reduces the probe life span.

Note! Failure would not be immediate and might not affect all plugs.

TERMINAL INSULATOR BURNT AWAY

Common cause

Loose or burnt connection between loom and plug terminal.

Resulting failure

Arcing during operation, particularly on a hot engine, can lead to failure of the terminal insulator sleeve. A complete system short would result.

PROBE TIP IS COMPLETELY BURNT AWAY EXPOSING CORE

Common cause

Any of the previously mentioned causes, but in particular the causes on the first photo at the beginning of this article. Compounded by general overheating.

Resulting failure

Glow plugs are subjected to massive voltage overload with possible prolonged energy cycle due to faulty timer.

General overheating will encourage burn out. Plug tip literally melts to destruction.

GLOW PLUG BODY IS SOOTY RIGHT UP TO & INCLUDING THE LOWER BODY THREAD

Common cause

Seating cone has not sealed due to lack of torque or to tightness of thread

Resulting failure

Compression ratio is reduced promoting over use of plugs for initial start-up. Damage to head thread can also result.

FILAMENT TUBE DETACHMENT

Common cause

(1) Starter boosting & jump starting.

(2) Misdirected injector spray.

Resulting failure

(1) Excessive voltage causes an internal short. The fused wire can arc to earth within the tube & melt a fatigue break through resulting in tube detachment. Plug body is normally tempered brown at the fuse point.

(2) Fuel spraying directly at the filament tube can instigate a thermal fatigue break due to the hot/cold temperature cycle.