

SPARK PLUG READINGS EXPLAINED

Look at the spark plug porcelain for the colour and condition of it. Plug colours tell the mechanic how the engine is running and can be very important. Plugs change colours and the different colours can explain such things as if the engine is running too hot or if the engine is worn. The colour should be read by looking at the porcelain insulator and compared to the plugs shown on the next few slides.

A tan coloured plug means that the engine is running normal and the air/fuel mixture is correct. This is the correct colour a spark plug should be and it tells the mechanic everything is fine with the engine. The mechanic would install a new properly gapped plug. When installing a new plug, replace the old one with the same heat range. This plug shows normal wear in the centre electrode. A new plug would have square edges that help the plug fire better.



A black dry fluffy coloured plug is caused by deposits from a carburettor that is running too rich (too much gas), or excessive idling on some engines. Black smoke coming from the exhaust is a sign of a rich air/fuel mixture. The rich air/fuel mixture must be repaired before installing a new spark plug. Common causes for a rich air/fuel mixture are:

- Dirty air filter.
- Air mixture screw or carburettor needs adjusting.
- Choke is sticking.
- Carburettor float height is out of adjustment or float is sticking open.

A black wet glazed coloured plug is caused by the burned oil that is leaking past the piston rings or valve guides and burning in the cylinder. This engine will have blue smoke coming out of the exhaust. It is a sign that the engine will need rebuilding. Two strokes that have this colour spark plug are burning the transmission oil from the crankcase. If a new spark plug is installed it will foul and quit working. Common causes for this problem are:

- Worn piston and rings.
- Worn cylinder bore.
- Worn valve guides.
- Crankshaft seals are bad or cases that need lapping (if on a two stroke engine with a transmission).



A white coloured plug is caused by engine overheating. Failure to repair this engine will result in severe engine damage. Common causes for this are:



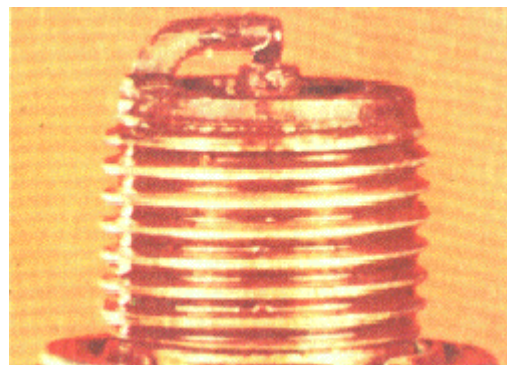
- Incorrect spark plug (too hot heat range).
- Low octane fuel.
- Timing is not set properly.
- Cooling problems, (dirty cylinder fins, no or low water if water cooled, low or no engine oil).
- Carburettor air/fuel mixture is too lean (too much air).
- Leaking crankshaft seals, no oil, base or head gasket leaks, or crankcase leaks on two stroke engines.

The plug here shows what can happen when something hits the spark plug. Something from inside the engine has hit the plug and this problem must be repaired before running the engine further. Make sure the spark plug is the correct length for the engine.



Excessive detonation has caused the porcelain on this plug to break away. If this engine is allowed to run, engine damage can occur. Make sure the fuel octane is high enough for the engines requirements.

This plug has carbon across the plug gap. This is usually caused by carbon that is loosened and it lodges between the gap causing the plug to misfire.





This plug was caused by pre-ignition and failure to repair this condition will cause engine damage. Check for the following:

- correct heat range plug
- over advanced ignition timing
- lean air/fuel mixture
- cooling system
- lack of lubrication

This plug is worn out from being used for a long period of time. Notice how the centre electrode is round and worn from use. A spark plug that is worn takes a lot more voltage to fire and can cause poor engine running.

