

it with a hammer before throwing it away so no one else will be tempted to use it. Cracked insulators compromise the heat-transfer mechanism for the center electrode. When the center electrode gets too hot it causes preignition of the fuel-air charge—preignition means the fuel-air charge is prematurely ignited by something other than the spark plug. This ignition always takes place before the piston has reached optimum position on the compression stroke. The result is always a loss of power that has the potential to lead to serious cylinder damage.

Both TCM and Lycoming service data state that new copper sealing gaskets must always be used when installing spark plugs. These can be purchased from supply houses. These gaskets provide one of the most important heat-transfer paths for the spark plug. With use, these gaskets harden and deform, which compromises spark-plug cooling. Before installing plugs, lubricate the threads with a small amount of anti-seize compound, making sure that the compound is not applied to the thread closest to the firing tip.

The threads of the spark-plug boss in the cylinder head should be clean before installing spark plugs. The best way to test for cleanliness is to screw the plug into the boss by hand—if the plug can't be run almost all the way down into the boss, the threads are dirty and a special spark-plug thread-chaser tool should be used to clean them. Another alternative is a stiff-bristled toothbrush. Apply a little grease to the toothbrush first so the debris that's scrubbed off the threads sticks to the grease instead of falling into the combustion chamber. And always use a torque wrench when installing a spark plug. Lycoming specifies a spark-plug torque of 420 inch pounds and TCM recommends 300- to 360 inch pounds. Over-torquing results in the threads of the plug barrel extending down into the combustion chamber. Overheating and preignition can result.

Spark plugs wear during operation when material is transferred from the center electrode to the shell electrodes, or vice versa, during each spark event. Because of the peculiarities of magnetos and the firing order of the spark plugs, the spark polarity at each spark-plug lead is always the same. The direction of transfer depends on the position of the plug in the engine. To get the maximum life from a plug, this transfer has to be reversed by rotating the plugs at regular in-

tervals. One method is to transfer each plug to the next position in the engine firing order, and move it from the top to the bottom plug hole, or vice versa. For example, the firing order of a TCM O-200 engine is one, three, two, four. Rotating these plugs would require the top plug of cylinder number one to be installed in the bottom plug hole of cylinder number three, and then the bottom plug of cylinder number one to be moved to the top plug hole of cylinder number three, and so on.

Old-time auto mechanics say that the act of buying and installing a set

of spark plugs is the least expensive tuneup available. Airplane spark plugs are a little different because of the cost—substitute regular maintenance for buying a new set and the saying that prevention is the best cure is still valid.

ACRA

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Links to additional information about spark plugs may be found on AOPA Online ([www.aopa.org/pilot/links.shtml](http://www.aopa.org/pilot/links.shtml)).

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LIGHTNING DATA

TFRs

CONVECTION

FLIGHT CONDITIONS