

FOR BETTER NAVION FLYING

SPARK PLUG FOULING - SOME OF ITS CAUSES AND CURES

The increases in the frequency of so-called lead fouling of spark plugs in aircraft engines requiring the use of higher octane gasoline is the result of increases in the lead content of these fuels. This has been brought about by the Petroleum Administration for Defense Order No. 4, effective October 30, 1951, which states in part that; "Commercial aviation gasoline for use by aircraft when operating within or departing from the United States shall contain at least 4.0 ml of lead per gallon for fuels of grades higher than 80. All grade 80 fuel will contain at least .50 ml of lead per gallon".

From the above it can be easily understood why lead fouling of the plugs in engines requiring the use of 91 grade fuel will be more prevalent than in those requiring the use of 80 grade fuel. CAA Aviation Safety Release No. 355, dated January 15, 1952 has the following to say about certain adverse conditions that may arise as a result of the higher lead content:

1. There will be increased deposits from combustion products.

This condition can cause detonation, preignition, valve sticking, burning, spark plug fouling, and piston ring sticking. The increase in deposits may occur chiefly in only certain cylinders because of tendencies toward unequal lead distribution or uneven fuel distribution.

Increased deposits may be reduced, or the adverse effects minimized by the following:

- (a) Cruise with warm (60 to 75°F) carburetor air and maintain cylinder head temperatures to the high side.
- (b) Avoid extremely lean operation.
- (c) Remove and clean or renew spark plugs more frequently.
- (d) Periodically exercise exhaust valves while supplying penetrating oil or "upper lube" to the valve stem or supply such oil to the air inlet when the engine is idling. Such practice may offer some relief from sticking valves.
- (e) Periodic cylinder top overhauling may be necessary between major overhauls in order to forestall chronic failures of the pistons and valve components.

(f) Periodic "wheeze" checking is suggested in most cases, since this can be performed easily and frequently (even daily) when pulling the propeller through slowly by hand and at the same time listening for leaking valves. Compression checking, while more involved, is recommended as a more thorough and more valuable inspection.

2. There may be increased deposits in oil passages and on the interior surface of the engine.

This condition can cause lubrication stoppages with possible failure of critical bearings, etc. If such failures occur, they usually occur at high time since overhaul.

These adverse effects may be alleviated by the following.

- (a) More frequent oil changes.
- (b) Clearing critical oil passages periodically.
- (c) Top overhauling or more frequent major overhauls.

3. There may be increased supercharger and induction system deposits. (NOT APPLICABLE TO NAVION)

4. There may be occasions when fuel with greatly increased specific lead content is encountered.

This can result from long time storage under hot conditions, which causes loss of some of the more volatile fuel constituents. Use of such fuel is not recommended.

Copies of the release quoted above may be obtained by addressing a request to:

Civil Aeronautics Administration
Aviation Information Office
Attention: Inquiry Branch, W-58
Washington 25, D. C.

NOTE: Owners of Lycoming powered Super 260 model Navions are reminded that it is possible to have a carburetor modification made at the Lycoming factory that will permit them to use the 80/87 grade fuel instead of the 91 grade that is normally required. Contact your nearest Navion Distributor or Dealer for price and de-

livery information on this carburetor change. Also at least one major oil company and perhaps more is hard at work on the development of a lead scavenging agent, which when added to the fuel will help to overcome some of the effects of the increased lead content. As we go to press, none of these scavenging agents are ready for market; however rather encouraging results are being obtained during the service testing phase of their development.

PREFLIGHT INSPECTION PROCEDURE

If our observations are correct, many a pilot performs the preflight inspection on his Navion without full knowledge of where to begin and where to end. A definite procedure is very important in accomplishing this inspection as it is so easy to be inconsistent in your hurried examination of the airplane before take-off if a comprehensive plan is not practiced. Here, for more convenient reference, is the preflight inspection procedure printed on page 117 of the Navion Service Manual:

After checking the area around and under the airplane for obstructions or loose objects, proceed as follows:

POWER PLANT

1. Check ignition switch off.
2. Examine propeller for nicks, cracks, and oil or grease leakage. Check cleanliness of blades and security of mounting. Check retainer nut lockpin to see that it is loose.
3. Pull propeller through three revolutions.
4. Examine carburetor air filter for cleanliness and freedom from obstructions.
5. Check oil level and securing of filler cap.
6. Check hydraulic reservoir filler cap for security.
7. Examine engine section for cleanliness. Check to make sure that engine section contains no rags or tools.

8. Fasten cowling and make sure that right and left gill access doors and oil drain door are secure.

LANDING GEAR

1. Observe struts and tires for normal inflation. (Shake airplane if necessary).
2. Examine wheels, struts, and torque links for cleanliness.

WINGS AND WHEEL WELLS

1. Check wheel wells for freedom from obstructions.
2. Drain small amount of fuel from accumulator tank to remove sediment or water. (Before first flight of day only).
3. Remove fuel filler cap, check fuel quantity, and replace cap securely.
4. Remove pitot tube cover.
5. Check wing access doors and fairings for security. Inspect wing surfaces for cleanliness. Check wing for damage.

FUSELAGE AND EMPENNAGE

1. Check fuselage access doors and removable section of dorsal fin for security.
2. Check all surfaces for damage. Inspect surfaces for cleanliness.
3. Shake stabilizers to detect looseness.

CABIN

1. Check cabin interior for proper stowage of equipment and freedom from loose objects.
2. See that windshield and window panels are clean.
3. Check operation of radio, lights, and surface controls.
4. Start engine and check for proper operation according to Pilot's Check List.

Practice the above procedure until it becomes automatic and you can always take off with confidence in the general readiness of your plane for flight.