

D-Motor International bvba

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Service Bulletin NO. 2019-015

SUBJECT : Heating and overheatingMODELS AFFECTED : All modelsTIME OF COMPLIANCE : All operational hoursAFFECTED SERIAL NUMBER(S) : All engines

Although hot weather is the most common cause of **overheating**, many other factors can cause the same problem. If **your** engine **overheats** in flight in normal weather, one of the following may be the culprit: The water and coolant level in the radiator is low. There's a leak in the cooling system, your cowling is not built to cool the engine enough !

D-Motor International builds solid engines.

The long life and safe life of our engines is linked directly with the operation temperature of the water, air and oil !

We would like to inform the OEM / Integrators of our engines to test the engine after integration thoroughly !

As a engine manufacturer, we do not have a hand in the cowling or cooling system that is used !

Our Engine Control Unit (ECU) logs all active temperatures at a rate of 10 samples per second.

Our EOM (Engine operating Manual) defines the following recommendations :

Oil pressure 1.5 - 5.0 bar

Oil specification Synthetic 5W50 - 5W40 - 0W50 – 0W40

| Service Bulletin 2019 - 015 | | | | | | | |
|-----------------------------|-------|------|---------|-------|------|-------|------|
| ISSUED | | | REVISED | | | Pages | Rev. |
| Day | Month | Year | Day | Month | Year | | |
| 16 | 07 | 2019 | 18 | 07 | 2019 | 4 | 1 |

| | |
|---------------------------------------|--|
| Oil quantity | 3.5 Liters |
| Oil filter | Mahle OC 475 (11 W 27) |
| Oil temperature | min 50° C to 120° C 80°C to 95 °C best range |
| Cooling liquid | Water with antifreeze and anticorrosive (for Aluminium motors) |
| Cooling liquid temperature Ambiënt | 50°C to 110°C (opening pressure at 1.2 bar) – peak value 50°C to 120°C (opening pressure at 1.4 bar) – peak value 75°C to 95°C best range – Endurance max 100 °C |



A Engine should not exceed 100°C !!

The Engine is NOT built for that temperature range !

There is a big difference between 'Ambiënt' temperature and 'effective' temperature.

Having a temperature monitoring sticker on the backplate indicating 105°C for example means that the engine has temperatures of over 130 – 140°C.

These temperatures are having a destructive influence on your engine !

EGT and CHT ?

An exhaust gas temperature gauge (**EGT** gauge) is a meter used to monitor the exhaust gas temperature of an internal combustion engine in conjunction with a thermocouple-type pyrometer. ... By monitoring **EGT**, the driver or pilot can get an idea of the vehicle's air-fuel ratio (AFR).

Exhaust Gas Temperature (EGT) Gauge - Indicates the temperature of the exhaust gas just after combustion. Used to set the fuel/air mixture (leaning) correctly. Cylinder Head Temperature (**CHT**) Gauge - Indicates the temperature of at least one of the cylinder heads. Used to set the fuel/air mixture.

| Service Bulletin 2019 - 015 | | | | | | | |
|-----------------------------|-------|------|---------|-------|------|-------|------|
| ISSUED | | | REVISED | | | Pages | Rev. |
| Day | Month | Year | Day | Month | Year | 4 | 1 |
| 16 | 07 | 2019 | 18 | 07 | 2019 | | |

D-Motor delivers optional a dashboard gauge with monitoring probes per cylinder.



As our engines are not operated by a carburetor, the display can be changed at customers demand. Basic idea is that the pilot has an overview of all 4 or 6 cylinders, and can take action before the engine overheats.

The Water and Oil temperature is important !

Water boils at 100°C !! Keep this in mind at all times.

Water can get into the oil two ways. You generally don't have to worry about one of the ways if you fly your aircraft enough to burn off the water during normal flying. This drives off the moisture that simply comes from your engine breathing when it is not being used (cold air enters a hot engine and water condenses) and from combustion byproducts. The second more destructive route is through a coolant leak due to a bad gasket, an engine crack, etc.

The above facts usually are due to bad cowling/cooling engineering !!

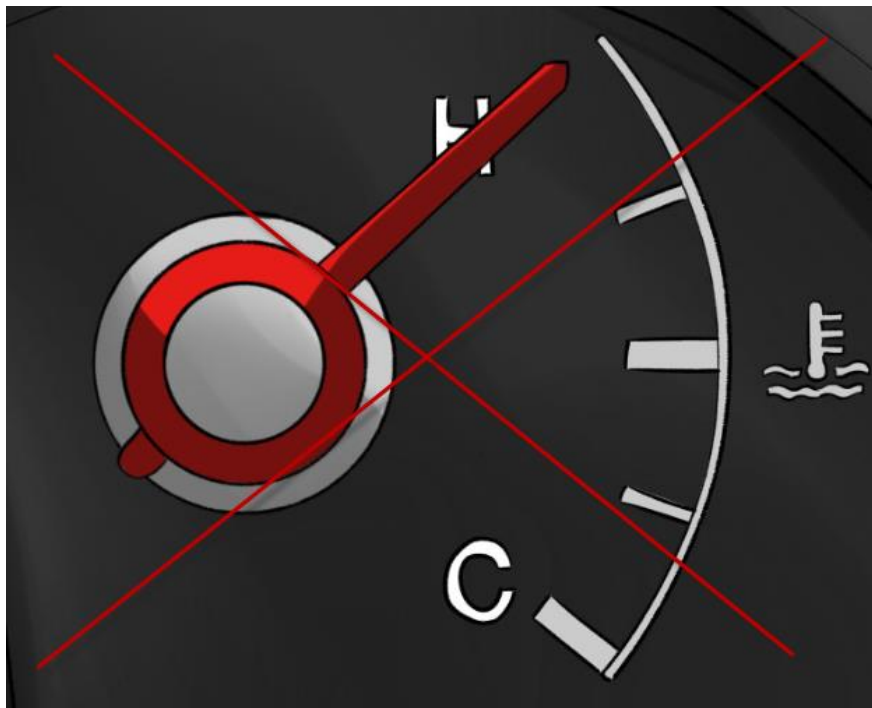
This amount of moisture is generally going to cause serious engine issues including loss of power, oil sludging, etc. **Consult D-Motor when in doubt.**

| Service Bulletin 2019 - 015 | | | | | | | |
|-----------------------------|-------|------|---------|-------|------|-------|------|
| ISSUED | | | REVISED | | | Pages | Rev. |
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| 16 | 07 | 2019 | 18 | 07 | 2019 | | |

Pilot Instructions water temperature : (in addition tot he Engine Owners Manual)

The cooling system at 1.2 Bar does not have the same values as pressurized at 1.4 bar !!

| | Water Temperature (°C/°F) press. at 1.2 Bar / 17.4 PSI |
|----------------------------------|---|
| NORMAL OPERATION | 0 – 90 °C / 0 – 194 °F |
| CRUISE OPERATION | 90°C – 95°C / 194 °F – 203 °F |
| HOT OPERATION | 95°C – 100°C / 203 °F – 212 °F |
| DO NOT EXCEED TEMPERATURE | Above 100 °C / Above 212 °F |



| Service Bulletin 2019 - 015 | | | | | | | |
|-----------------------------|-------|------|---------|-------|------|-------|------|
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