

TTK Hydrocarbon Leak Detection Sensor Cleaning Procedure

Cleaning Fluids

TTK oil sensor(s) – FG-OD sense cable range or FG-ODP point sensor range - contaminated by a non-volatile hydrocarbon / compound shall be cleaned using one (or several, if required) of the fluids specified below.

NB: if the contamination is only due to a volatile hydrocarbon / compound, the contaminant would vaporize by itself after about one hour – no cleaning required in this case.

1. Hydro-treated Light to Medium Naphtha, SPB 100-160 or Lighter Fluid

- Composed by Hydrocarbons, C7-C9, n-alkanes, isoalkanes, cyclics
- EEC / EINECS No: 920-750-0, 270-093-2, 265-151-9, 203-892-1 or equivalent
- CAS No : 64742-49-0, 64742-82-1, 64742-48-9, 68410-97-9 or equivalent

This is de-aromatized naphtha, usually employed for dry cleaning or other domestic cleaning.

Lighter refilling fluid has a similar composition and can also be used as a solvent to clean FG-OD cables.

2. Commercial-grade Acetone

- Chemical name : PROPAN-2-ONE
- EEC / EINECS No : 200-662-2 or equivalent
- CAS No : 67-64-1

3. Commercial-grade Motor Gasoline, Unleaded

- Following EN 228 or ASTM D4814 or JIS K 2202 or CGSB 3.5-2004 or equivalent

Commercial motor gasoline would be most suitable for cleaning liquids containing aromatics - such as jet fuel - or heavier cuts.

NB: depending on local specifications and production processes (distillation, blending), some motor gasolines may contain some heavy ends which could cause alarm status on the sensing cable concerned by the cleaning process. Should this be the case, it is required either to clean the sense cable using fluid type 1 or type 2, or to expose the sense cable to mild heat ($T < 90^{\circ}\text{C}$).

4. Commercial-grade White Spirit – Medium to Heavy Naphtha

- Hydro-desulphurised heavy ends (C8-C12), including aromatic compounds (1-20%)
- EEC / EINECS No : 232-489-3, 265-150-3, 265-185-4 or equivalent

- CAS No : 8052-41-3, 64742-48-9 (heavy naphtha), 64742-82-1, 64742-88-7 or equivalent

Fluid type 1 specified above is recommended to clean compounds such as gasoil oil or lighter cuts.

Alternatively, fluid type 2 can be used, though less efficient than fluid type 1 – may require several cycles. Fluid type 2 can also be used to eliminate Sulphur odors e.g. after contact with gasoline.

Fluid type 3 and fluid type 4 are recommended to clean heavy oils such as heavy fuel oil or crude oil, though generally this would require several cleaning cycles and a final cleaning with Fluid type 1 or 2 to remove some residual heavy ends.

Light and medium distillates can also be eliminated by exposing the contaminated sense cable to a mild heat source (sun, hot fan, ...) in order to increase the cable temperature (max. 90°C) for sufficient time. In this case, the heating process will be stopped once the contaminating ends are evaporated and the alarm disappeared.

Other petrol distillation cuts, such as condensate, can also be used as cleaning solvent.

NB: TTK recommend avoiding other types of solvents such as trichlorethylene or tetrachlorethylene.

Cleaning Procedure

Precautions:

Recommendations included in the Material Safety Data Sheet (MSDS) of the selected liquid shall be followed.

MSDS's are made available by the liquid supplier (usually on their website).

Read the applicable MSDS carefully prior to start using the selected liquid.

Health and safety precautions related to handling of harmful, flammable / hazardous liquid shall be respected, including (but not limited to):

- breathing of vapors from the cleaning liquid shall be avoided;
- cleaning shall be performed in a place sufficiently ventilated;
- no ignition source shall be present close to the cleaning area.

Cleaning Process flow:

See flow diagram on the following page.

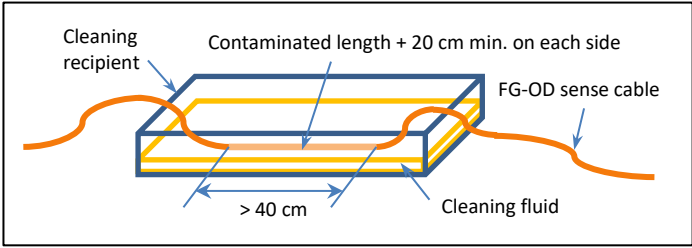
NB: cleaning recipient material: glass or metal – no polymer recipient to be used.

Cleaning solvent disposal:

Provide appropriate disposal (e.g. combustion in adequate location) of the used cleaning solvent - not to be dispersed in the environment.

Hydrocarbon Leak Detection Sensor Cleaning Process Flow

Figure 1 : Sense cable



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      Start((START)) --> Step1[Disconnect the oil sensor, remove it from the oil contamination and wipe the excess of oil on the sensor with absorbent paper.]
      Step1 --> Step2[Place the oil sensor in a cleaning recipient  
Sense cable: refer to Figure 1 - Point sensor : use a cylindrical recipient with min ID = 45mm]
      Step2 --> Step3[Pour cleaning liquid in the cleaning recipient]
      Step3 --> Step4[Place the sense cable in contact with the cleaning liquid, by full immersion, respecting the guidelines below :  
NB : do not immerse cable connectors or point sensor head]
      Step4 --> Step5[Wait at least 1 hour]
      Step5 --> Step6[Take the sense cable out of the liquid and place it in a ventilated place to allow solvent weathering – possibly outdoor and at the sunshine.]
      Step6 --> Step7[Wait 1 to 2 hours - depending on ventilation and temperature. Increase weathering time if the ambient temperature is lower than 15°C.]
      Step7 --> Step8[Re-connect the sensor and check its status]
      Step8 --> Dec1{Is the cable still in alarm?}
      Dec1 -- NO --> End1((END of cleaning procedure))
      Dec1 -- YES --> Step9[Allow more weathering time, possibly increasing the cable temperature (up to 90°C max.)]
      Step9 --> Step10[Re-connect the cable and check its status]
      Step10 --> Dec2{Is the cable still in alarm?}
      Dec2 -- NO --> End2((END of cleaning procedure))
      Dec2 -- YES --> Step2
  
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Leave at least 5 mm of liquid on the top of the immersed cable.	Length to be immersed = length in contact with diesel plus 20 cm on each side.	Use fresh (unused) liquid.
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