Test kits for lubricating oils

Common manual for the following Unitor products:

Section 1: Water In Oil
Section 2: BN Test
Section 3: Salt Water Determination
Section 4: Insolubles Loading
Section 5: Viscosity Comparison

MA-K17778-UN Issue 6

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Test Kits, Spares and Reagents

Code	Description
532414	Water/TBN Replacement Reaction Cell
773156	EasySHIP Water in Oil Reagent Replacement Pack
532380	Water in Oil Replacement Cell
625749	Insolubles Test
625756	Salt Water Determination Kit

- **Quick Start Guide**
- **Product Data Sheet**
- **Safety Data Sheet**
- **Test Cell Utility Software**
- **Example Utility Files**

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Water in Oil Test

Hydrogen gas build-up risk.
Use in well-ventilated areas.
Dispose of test waste carefully.

Charging DIGI+

Charge fully with Micro-USB cable before first use

Refit USB socket cover

Fully charged battery run time: 50 tests

***Note:** Charge fully at least once every 6 months*

Powering On

Use Left (L), Middle (M) or Right (R) button to power on

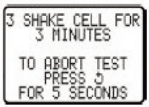
Testing - Water (H_2O) - SPOT (single oil test) for DIGI+ Water and DIGI+ Combined

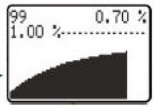
RANGE* → OK → START

Follow on-screen instructions

*Select the test range for the approximate amount of water. If not known, select 0.1 % - 20.0 % to reduce risk of overpressure.

***Note:** Close and hand tighten only (1/8 turn max.)*





TESTING IS COMPLETE

Check result against limit for the test point

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Cleaning

Dispose of contents carefully and wipe with a lint-free cloth. Use a mild solvent if necessary, for example, isopropyl alcohol.

Powering Off

OR

AUTO-OFF after 5 minutes

BN Test

Charging DIGI+

Charge fully with Micro-USB cable before first use

Refit USB socket cover

Fully charged battery run time: 50 tests

***Note:** Charge fully at least once every 6 months*

Powering On

Use Left (L), Middle (M) or Right (R) button to power on

Testing - BN - SPOT (single oil test) for DIGI+ BN and DIGI+ Combined

BN compares the pressure generated from a used oil test to a new oil test. For each oil type, new oil is measured and saved as a calibration for future used oil tests.

Calibration

Cell must be calibrated for each of the oil types to be measured using a new sample of unused oil before used oil can be tested.

(Back to) **HOME** screen

SETUP

▼ **OILS** **OK**

Select Oil using ▲▼ **OK**

NAME Enter name using ▶▼ **NEXT** **DONE** **OK**

BN Enter BN using ▲▼ **OK**

CAL

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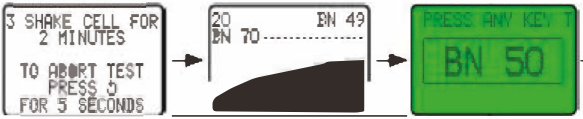
Measure Used Oil

Select Oil using ▲▼

OK → (Follow on-screen instructions)

Note: Close and hand tighten only (1/8 turn max.)



TESTING IS COMPLETE

Check result against limit for the test point

Cleaning

Dispose of contents carefully and wipe with a lint-free cloth.
Use a mild solvent if necessary, for example, isopropyl alcohol.

Powering Off

OR **AUTO-OFF** after 5 minutes

Salt Water Determination

- Add 2ml of Reagent H to the test tube.

  Shake the oil sample and draw off 5ml using the syringe provided. Add this to the test tube, replace the cap and shake vigorously.

  Place the tube upright in **hot water** and allow to stand for 1 hour until the water settles out of the oil sample.

- Take one test pad from the box and replace the lid. Handle the test pads by the edges to avoid contaminating the surfaces with sweat.

  Puncture an area 10mm in diameter 10 to 15 times with the pin provided.

- Flush a pipette with Reagent H.

  Place the tip in the water layer in the test tube.

  Squeeze the bulb gently and draw off a sample of the water into the pipette.

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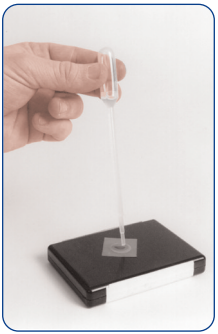
- Remove the pipette and wipe off any oil and return a few drops of water to the test tube.

  Place the next drop of water onto the prepared test pad.

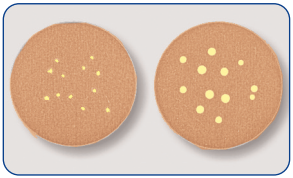
  Allow the pad to stand for 5 minutes.

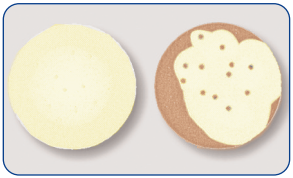


- Examine the pad:

  If there is no yellow colour, or only a very faint yellow patch appears, the contamination is **fresh water.**

  If a large yellow patch appears, the contamination is **salt water.**

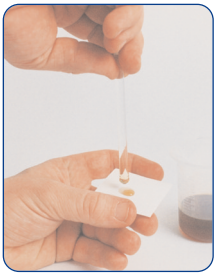




- A positive result should always be checked by testing another pad.

Insolubles Loading

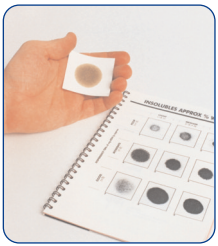
- Shake the oil sample bottle to mix the contents and pour a small volume into the beaker.



- Place a clean filter paper on a level surface.

  Dip the acetate rod into the oil and allow the first drop to return to the beaker.

  Place the second drop onto the paper and set aside for 24 hours.



- Compare the dried spot with the examples given on the page below.

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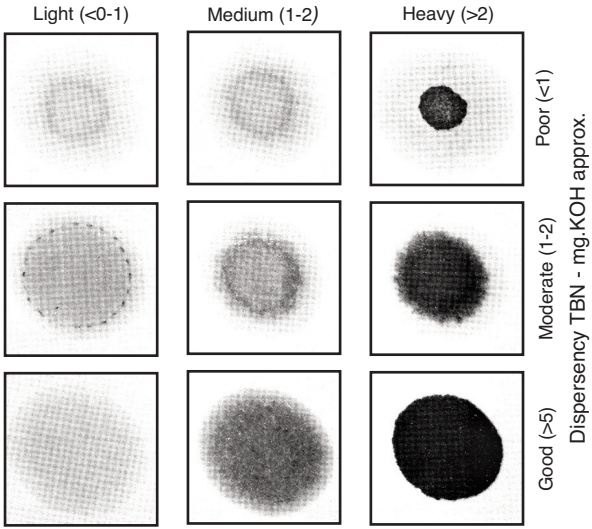
Insolubles % w/w approx.



Insolubles

This is indicated by the shade of the spot. A very dark spot indicates a heavy insolubles loading. If the dispersency is poor, only the centre of the spot will be dark.

Dispersency

This is indicated by the colour change from the centre to outside of the spot. A distinct colour change indicates reduced dispersency. (Low TBN is also an indication of reduced dispersency).

Viscosity Comparison

- Take samples of used and new oil and allow to stand for at least 1 hour.

  It is very important that both samples are at the same temperature.

- Place the Viscosity Stick on a flat, level surface.

  Add 5ml of used oil to one reservoir.

  Add 5ml of new oil to the other reservoir.

- Tilt the Viscosity Stick so that it rests on the angled base and allow the oil to run down the channels. When the new oil reaches the mid point on the scale, return the Viscosity Stick to the horizontal.

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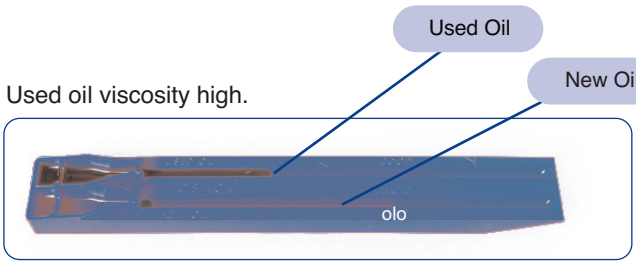
• Examine the point reached by the used oil:

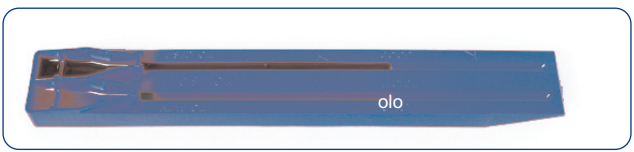
If the used oil has not reached the scale then the viscosity is **higher** than recommended.

If the used oil has over run the scale then the viscosity is **lower** than recommended.

A Used oil viscosity high.



B Used oil in satisfactory condition.



C Used oil viscosity low.