Mobil Serv℠

Onboard test kit user manual

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Performance by ExxonMobil

Mobil Serv℠ Lubricant Analysis onboard test kit contents

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- 1 x DIGI Cell
- 1 x Safety glasses
- 1 x Package of 100 gloves
- 2 x 500 mL ExxonMobil Reagent S
- 1 x 500 mL ExxonMobil Reagent TBN
- 3 x 5 mL syringes
- 3 x 10 mL syringes
- 1 x 100 mL beaker
- 50 x ExxonMobil EasySHIP Paste sachets
- 3 x Test agitator (pack of 3)

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Tests

Note: Reasonable care has been taken in the preparation of this publication, but we cannot guarantee or warrant its accuracy and completeness in every instance.

Warning

Always read ExxonMobil's Safety Data Sheets before using EasySHIP Paste, Reagent S or TBN.

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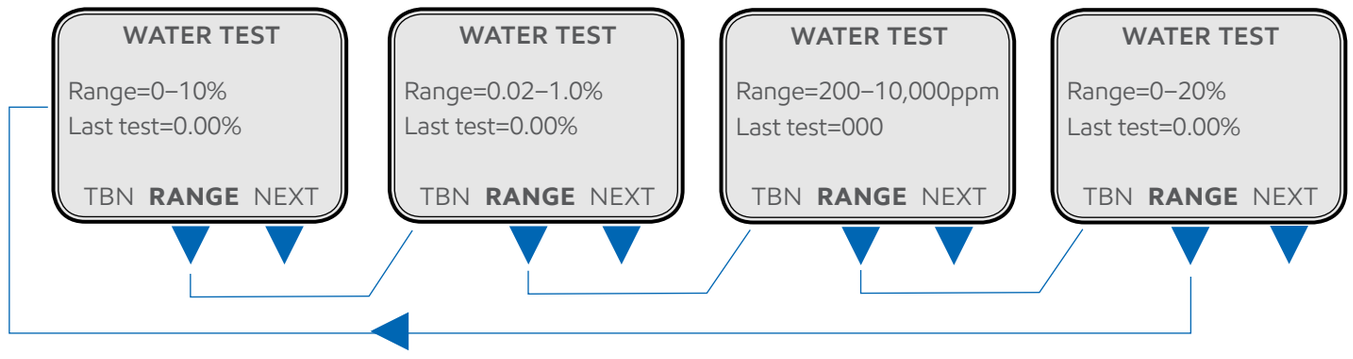
Water-in-oil test using EasySHIP Paste

Battery guaranteed for five years (or 5,000 tests).

1 Press right hand button to switch cell on. Cell will auto power off after six minutes of inactivity. Press **WATER** to switch between WATER/TBN mode.

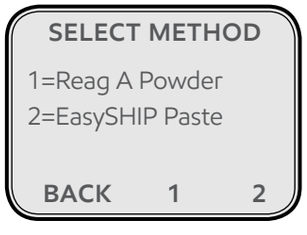
2 Press **RANGE** to change the required range of the test.
Four test ranges are available:

Range: 0-10%
Range: 0.02-1%
Range: 200-10,000 ppm
Range: 0-20%



Press **NEXT** to continue with chosen range.

3 Press 2 to run the test with EasySHIP Paste.



Note: Before starting the test, ensure that the inside of the cell is clean and dry (paying particular attention to the seal).

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4

Note: Always start your test with the highest range if you are in any doubt about the approximate amount of water in your test oil.

Overpressure can occur if you test an oil sample with a very high water content on the low range 0.02-1% (200-10,000ppm), which can cause permanent damage to the pressure sensor.

Shake the bottle of Reagent S thoroughly. Begin test by following on-screen instructions.

1) Add 20ml ReagS
2) Add All Paste
3) Add XXml Oil
4) Add Agitator
5) Replace lid

BACK **START**

Always fill with Reagent S to the upper line in the cell (20 mL).

Squeeze all of the EasySHIP Paste into the centre of the cell.

Add oil amount based on range.

Always use gloves when handling EasySHIP Paste.

Note:
The volume of oil used varies depending on which range.

Range: 0-10% = 0.5 mL oil
Range: 0.02-1% = 5 mL oil
Range: 200-10,000ppm = 5 mL oil
Range: 0-20% = 0.25 mL oil

5

Replace lid and press **START** to begin test.

DIGI Cell alignment: When tightening the DIGI Cell, ensure that marks are aligned as shown in the example below. If the marks do not line up, it will mean that the "O" ring is missing.

Shake cell until graph has finished

CANCEL - hold 5 sec


White marks are for illustrative purposes only.

50
1.47%

CANCEL - hold 5 sec

A graph will be plotted during the test time (180 seconds). To cancel the test, press and hold **CANCEL** for five seconds.

6

Your results will be displayed after the graph has been plotted.

Test complete
1.52%
Water in Oil
NEXT

Press **NEXT** to repeat test.

DIGI Cell cleaning procedure

Important: To ensure continued accuracy of test results, it is very important that the DIGI Cell is thoroughly cleaned immediately after every test.

Where applicable (EasySHIP), the agitator ring will also require cleaning.

Note: Always refer to the ExxonMobil MSDSs for appropriate PPE, such as hand protection, for handling Reagent S when performing a DIGI Cell test.

1. The DIGI Cell should be cleaned immediately after every test and before further use.

2. Place a small amount of Reagent S onto a clean, lint-free rag or tissue. Do **not** use water or water based cleaners.

3. Use the rag or tissue to thoroughly wipe around and remove all residue from the inside of both halves of the DIGI Cell, paying special attention to the gasket and cap thread.

4. Dry the DIGI Cell with another clean rag or tissue. The cell is now ready for use.

5. Refer to ExxonMobil's Material Safety Data Sheets (MSDSs) to ensure the appropriate personal protective equipment (PPE) is used when applying cell cleaning materials and the noted disposal requirements are followed when discarding any used cleaning rags or tissues. If you have any questions or need additional information, consult with your safety adviser.

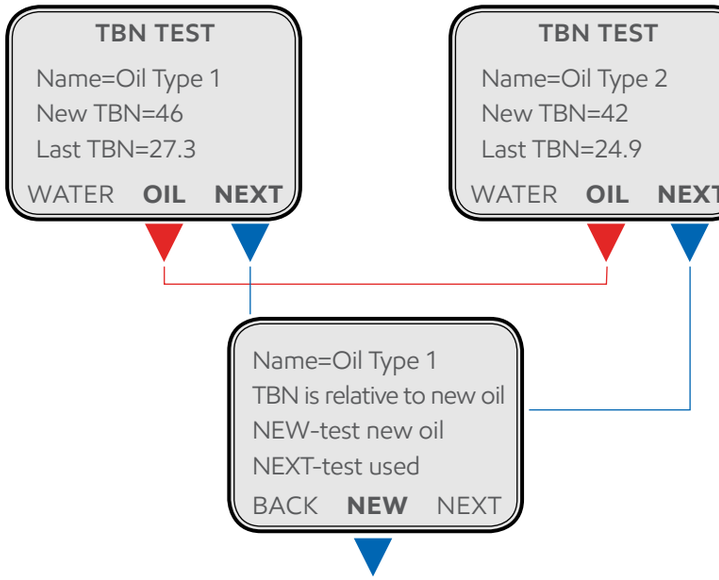
TBN/Alkalinity setup

Total Base Number (TBN) is determined by measuring the pressure buildup in the cell when a predetermined quantity of oil sample is added to a special reagent. The amount of sample needed is determined by the expected TBN. When using this cell for the first time, it is necessary to calibrate it for ***each of the oil grades*** to be measured. The cell is able to hold calibration data for up to seven different oil grades.

The calibration process requires a sample of new oil for each of the grades to be measured. We recommend you use the oil grade name as the "Name" during the cell setup process. The cell should be re-calibrated approximately every six months. The calibration can be checked by using new oil in the TBN test procedure, in place of used oil. The "test" TBN should be close to the new oil TBN.

1. Press right hand button to switch cell on.
Cell will auto power off after six minutes of inactivity.
Press **TBN** to switch between WATER/TBN mode.

2. Select the oil to be changed or edited by pressing **OIL**.
Once oil is selected, press **NEXT** to continue.



3. Press **NEW** to continue.

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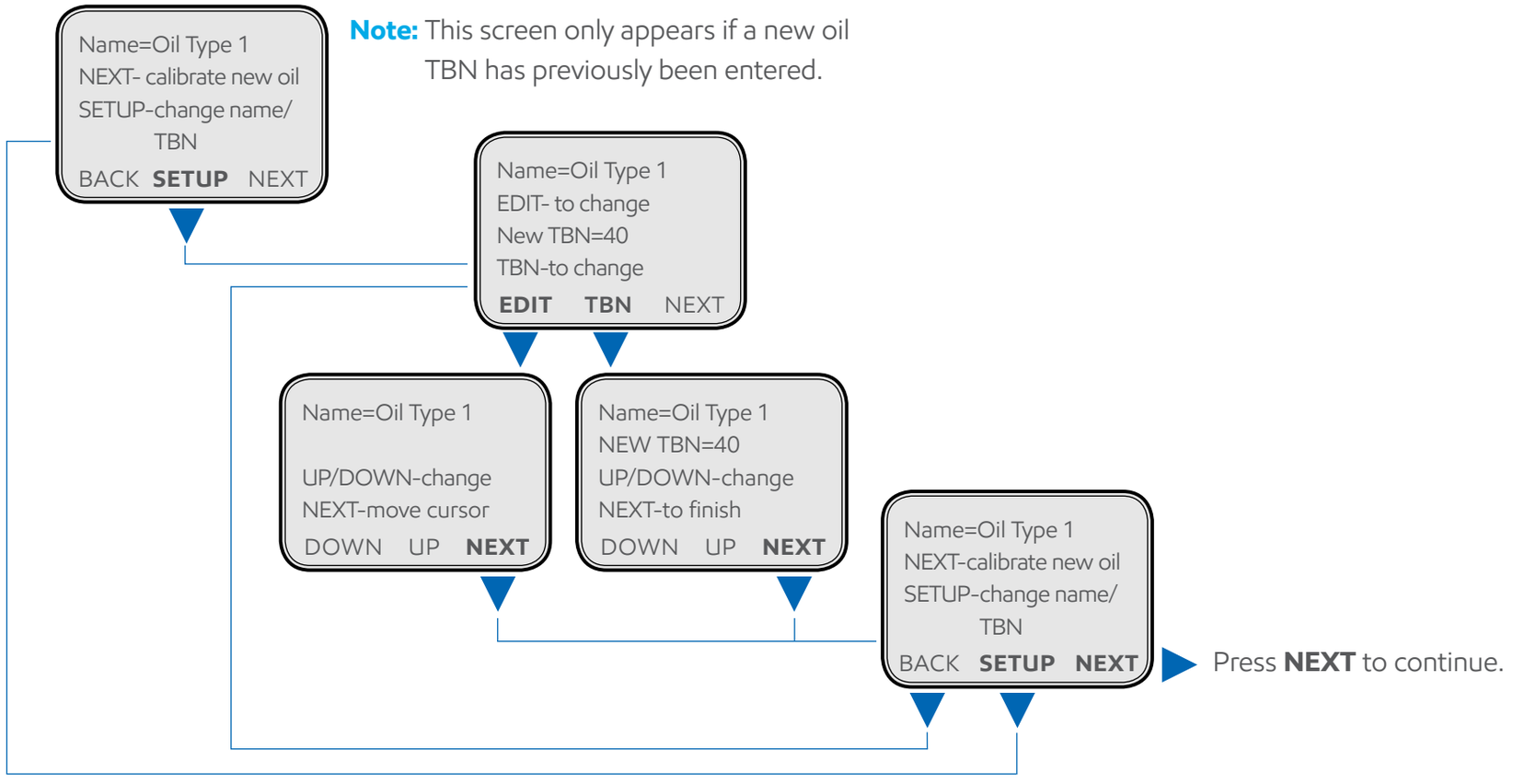
4 Press **SETUP**, then follow on-screen instructions to give your oil a name and change the new oil's TBN.



Note: This screen only appears if a new oil TBN has previously been entered.

5 Follow test instructions as detailed under **TBN Test** on the following pages, commencing at point 4 — "Begin test by following on-screen instructions."

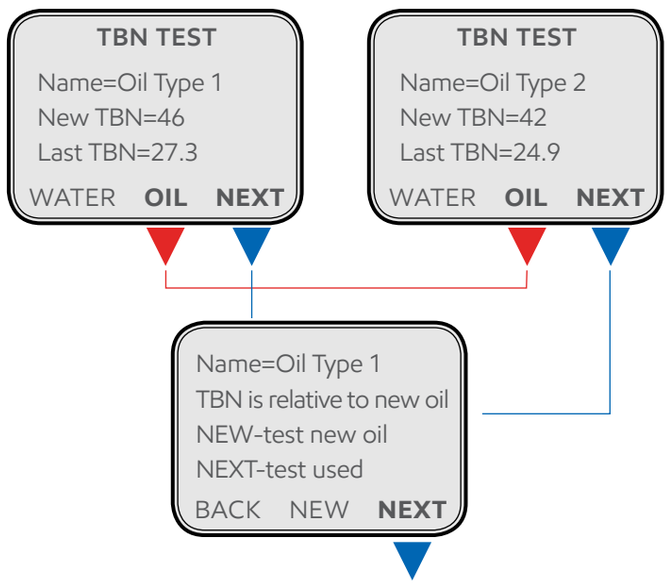
6 After the test is completed and the graph plotted, the screen will confirm that calibration is complete.

TBN/Alkalinity test

Battery guaranteed for five years (or 5,000 tests).

1 Press right hand button to switch cell on. Cell will auto power off after six minutes of inactivity. Press **TBN** to switch between WATER/TBN mode.

2 Select oil desired for test by pressing **OIL**.
If oil is not found, or if you have a new oil, follow **TBN Setup** instructions on page 4.



3 Before starting the test, ensure that the inside of the cell is clean and dry (paying particular attention to the seal).

Press **NEXT** to continue.

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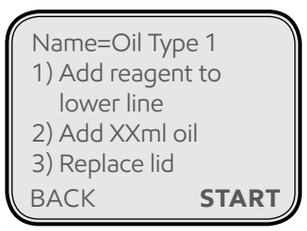
4 Begin test by following on-screen instructions.



Use Reagent TBN.

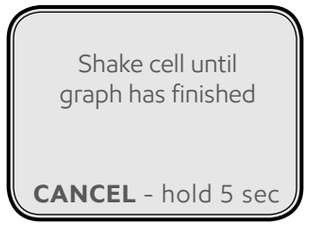
The amount of test oil used changes with the new oil TBN range.

Note:
Please ensure that you use the correct amount of Reagent and oil. Failure to do this could cause the cell to become over-pressured and damaged.

Range: 1-15 BN = 20 mL oil
Range: 16-50 BN = 5 mL oil
Range: 51-150 BN = 2 mL oil

5 Replace lid and press **START** to begin test.

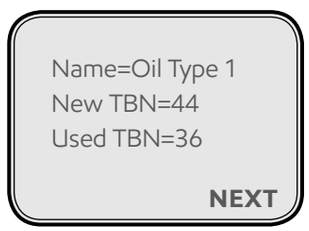
DIGI Cell alignment: When tightening the DIGI Cell, ensure that marks are aligned as shown in the example below. If the marks do not line up, it will mean that the "O" ring is missing.



A graph will be plotted during the test time (120 seconds). To cancel the test, press and hold **CANCEL** for five seconds.


White marks are for illustrative purposes only.

6 Test results will be displayed after the graph has been plotted.



Press **NEXT** to return to the first screen.

DIGI Cell cleaning procedure

Important: To ensure continued accuracy of test results, it is very important that the DIGI Cell is thoroughly cleaned immediately after every test.

Where applicable (EasySHIP), the agitator ring will also require cleaning.

Note: Always refer to the ExxonMobil MSDSs for appropriate PPE, such as hand protection, for handling Reagent S when performing a DIGI Cell test.

1. The DIGI Cell should be cleaned immediately after every test and before further use.

2. Place a small amount of Reagent S onto a clean, lint-free rag or tissue. Do **not** use water or water based cleaners.

3. Use the rag or tissue to thoroughly wipe around and remove all residue from the inside of both halves of the DIGI Cell, paying special attention to the gasket and cap thread.

4. Dry the DIGI Cell with another clean rag or tissue. The cell is now ready for use.

5. Refer to ExxonMobil's Material Safety Data Sheets (MSDSs) to ensure the appropriate personal protective equipment (PPE) is used when applying cell cleaning materials and the noted disposal requirements are followed when discarding any used cleaning rags or tissues. If you have any questions or need additional information, consult with your safety adviser.

Viscosity test procedure

Draw a representative sample of used oil and a similar quantity of new oil of the same grade.

Allow sample of used oil sufficient time to cool.

Allow all samples to equalise to approximately room temperature.
The temperature of the Flostick should be even throughout.

1 Fill the used oil reservoir until it flows into the used oil overflow reservoir.

Fill the new oil reservoir with new oil of the same grade until it flows into the new oil overflow reservoir.

2 Leave the Flostick in the horizontal position for about five minutes to equalise the oil levels and temperatures in both reservoirs.

3 Remove the surplus oil in both overflow reservoirs using a 5 mL syringe.

4 Tilt the Flostick and hold the raised position until the new oil has reached a position just before the "oIo" mark on the new oil groove. Quickly return Flostick to the horizontal position so the new oil stops at the mark. Note the point where the used oil stopped.

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Interpreting the results:

Refer to illustrations below to identify whether viscosity is satisfactory (**A**), low (**B**) or high (**C**).

A Used oil in satisfactory condition.

B Used oil viscosity too low — oil is too thin.

C Used oil viscosity too high — oil is too thick.

Cleaning the Flostick:

It is important to keep the Flostick clean and dry to achieve accurate results. Flush with Reagent S and dry with a clean, lint-free cloth. Check that the two holes in the bridgepiece are clear — remove any foreign material but take care not to enlarge the holes.

22777 Springwoods Village Parkway
Spring, Texas 77389
U.S.A.

MA-K13383-EM Issue 8

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