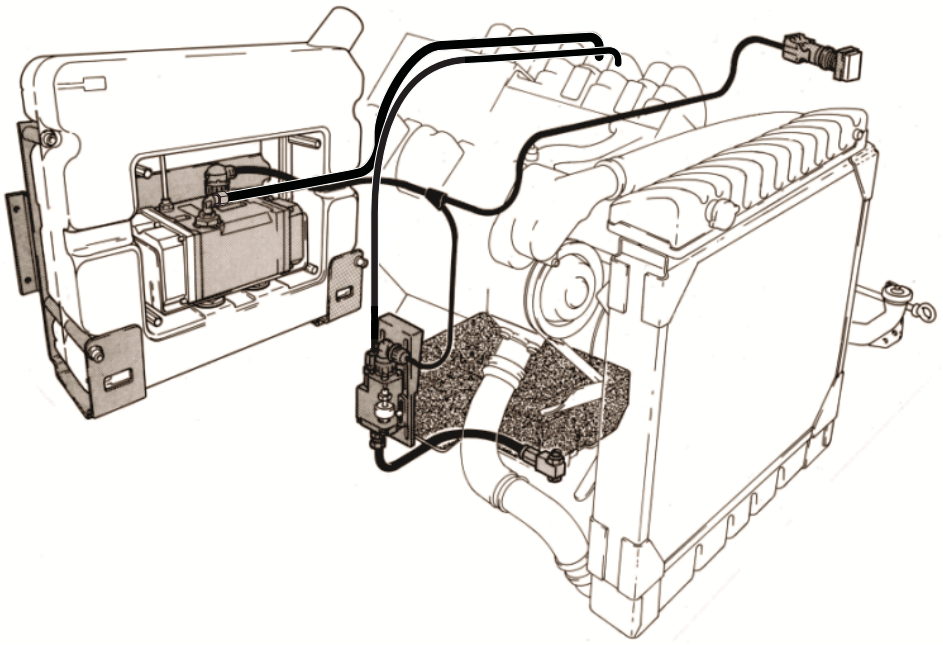
General Manual



Automatic oil level control system
Oilmaster

F214306R05

GROENEVELD

YOUR EFFICIENCY IS OUR CHALLENGE

General information

Type of manual	General Manual
System	Oilmaster Automatic oil level control system
Document number	F214306R05
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Preface

This general manual gives a description of the automatic oil level control system Oilmaster. It aims at giving insight in the system's operation and possibilities.
Furthermore, in this manual you will find the technical data on several components of the Automatic oil level control system Oilmaster.

In this manual the following icons are used to inform or warn the user:

ATTENTION

Draws the user's attention to important information meant to avoid problems.

WARNING
Warns the user for physical injuries or serious damage to the equipment caused by improper actions.

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1. General information

1.1 Introduction

A Groeneveld Oilmaster monitors the oil level in the sump of the engine (of a vehicle or machine) and automatically replenishes the oil, when required. The Groeneveld Oilmaster has been designed, and tested rigorously, to ensure it will operate error-free and will continu to do so year after year, even under the most extreme conditions.

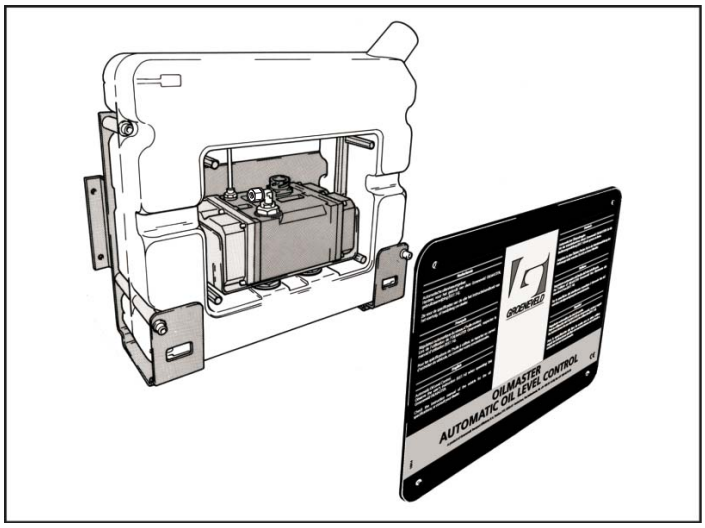

Figure 1.1 Oilmaster

ATTENTION
To ensure proper operation, it is essential that the system is installed properly, that the prescribed type of oil is used and that it is regularly checked. These periodic checks can be made to coincide with the regular maintenance tasks that must be performed on the vehicle or machine, for instance when replacing the oil. Our careful selection of constructions materials, makes the Oilmaster system virtually maintenance-free.

In this manual, quite some attention is given to the principles that govern the operation of the Oilmaster system. If you know how the system is supposed to operate, you will have little trouble in recognising any of the rare problems that it might develop.

1.2 The automatic oil level control system Oilmaster

The Groeneveld Oilmaster comprises a main tank with an integrated pump unit (electric gear pump). The system's digital control unit has been integrated with the pump unit. The pump unit comprises a calibration reservoir, which is used to measure-out accurately the quantity of oil that will be added to the engine.

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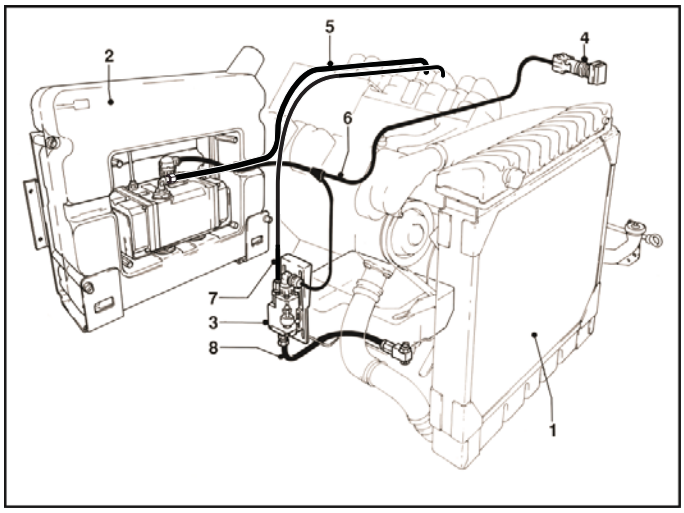

Figure 1.2 Components of the Oilmaster

A Groeneveld Oilmaster system comprises the following parts (Figure 1.2):

1. Engine
2. Oilmaster (main tank with pump unit)
3. Sump level sensor
4. Signal light (in-cab)
   The functioning of test push-button is optional and standard not wired.
5. Polyamide (PA) filler tube
6. Electrical wiring (in conduit)
7. Breather tube
8. Black rubber hose

The Oilmaster measures the oil level in the engine by means of a sensor (3) mounted to the side of the sump. The system can be tested by pressing the optional test push-button (4) in the cabin or by using the (Uni)GINA. A signal light in the test push-button allows the driver to observe whether the Oilmaster system performs properly of whether a problem has developed. The control unit maintains an electronic log of all errors and other events concerning the Oilmaster system.
The moment the driver switches the vehicle's ignition 'on' the Oilmaster performs a self-test. During that test, the control unit checks whether the pump, the electrical connections and the sensors of the Oilmaster are in order. Subsequently, the Oilmaster measures the oil level in the sump of the engine and the oil level in its own main tank (2).
If the oil level in the sump is too low, the Oilmaster will pump a quantity of oil from its main tank, via its calibration reservoir, to the engine (1). The amount of oil added to the engine is specified in the control unit, expressed as a number of pump cycles. During one pump cycle the whole contents of the calibration reservoir (0,5 litres) will be added to the oil in the engine. The quantity of oil added during a single pump cycle is always the same.
The Oilmaster performs its operation unobtrusively. The driver does not notice anything (unless the Oilmaster generates an alarm). It always remains possible to start the engine and to drive away immediately.

1.3 Types of the Oilmaster and options

There are several types of parts and options of the Oilmaster available:

- Oilmaster (1 hour and 3 hours version)
- Brackets
- Sump couplings
- Breather kit (from EURO 4 all engines have closed sumps. Standard in the Oilmaster kit)
- Counter kit
- Top fill extension kit

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2. Discription components

2.1 Components of the Oilmaster system

2.1.1 Main components

The Groeneveld Automatic oil level control system Oilmaster comprises the following main components (Figure 2.1):

1. Pump unit
2. Main tank
3. Signal light (in-cab)
   The functioning of test push-button is optional and standard not wired.
4. Sump coupling
5. Sump level sensor

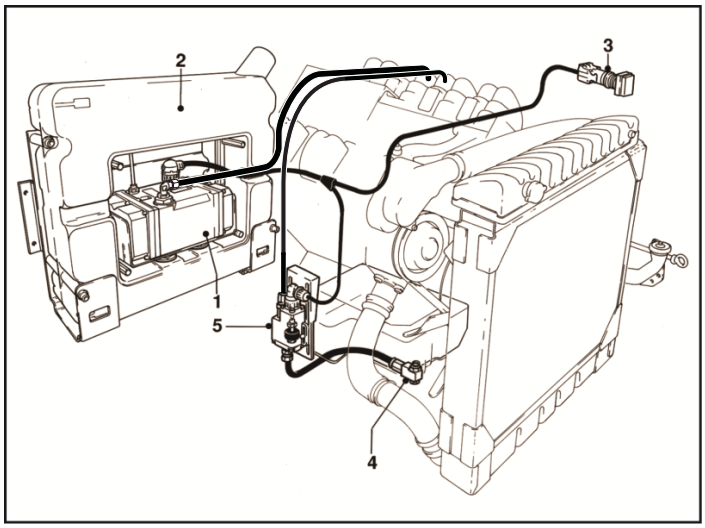

Figure 2.1 Pump unit with external components

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2.1.2 Components of the pump unit

The pump unit comprises the following components (Figure 2.2):

1. Control unit
2. Non-return valve (in the suction pipe)
3. Calibration reservoir
4. Level sensor (calibration reservoir)
5. Electric gear pump
6. Non-return valve in outlet coupling
7. Level sensor (main tank)
8. Electrical connector

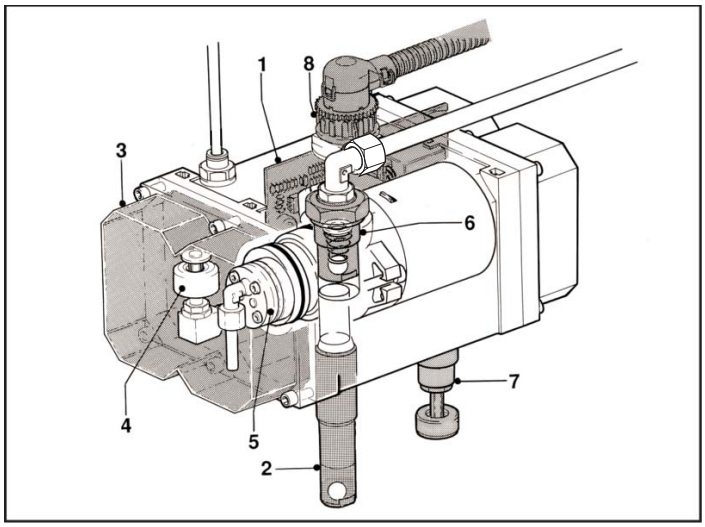

Figure 2.2 Components of the pump unit

2.2 Activation methods of the Oilmaster

The control unit (Figure 2.2-1) controls and monitors all actions performed by the Oilmaster system. The moment the Oilmaster checks the oil level in the sump depends on one of the following program options:

1. Ignition setting: each time ignition is switched ON, the Oilmaster checks in a split second the oil level. When it detects a low level it will start a filling cycle. This happens only if the engine has been switched OFF long enough so that the oil had been able to return to the sump. The Oilmaster is available in two ignition settings:
   - Fixed 3 hours delay time (engine switch OFF time):
     - Transport application / single shift a day
     - Off-road application / single shift a day
   - Fixed 1 hour delay time (engine switch OFF time):
     - Transport application / two shifts a day
     - Off-road application / two shifts a day
2. Neutral setting: the Oilmaster will check the oil level each time the gear lever remains in neutral for a predetermined time (with running engine). This activation method should be used for Off-Road applications in non-stop operation.
3. Stationary setting: the Oilmaster will check the oil level at a certain time interval (generator sets). This activation method should be used for engines on stationary applications running 24 hours a day.

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2.2.1 Automatic filling cycle

When during a measurement the sump level sensor detects a valid low level in the engine sump (Figure 2.1-5), the control unit starts a pump cycle. The pump cycle starts with the suction phase (Figure 2.3).

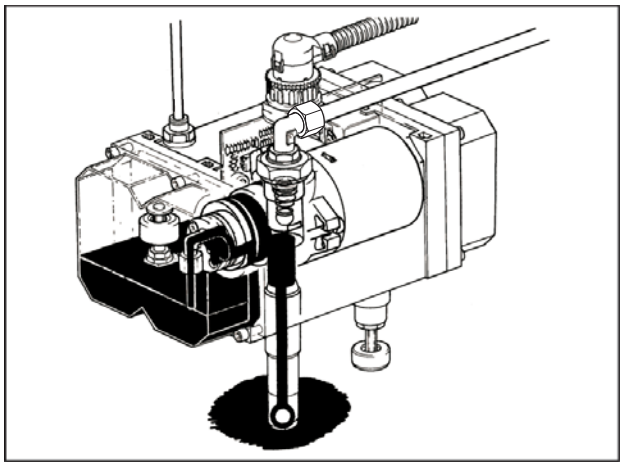

Figure 2.3 Filling the calibration reservoir

The electric gear pump (Figure 2.2-5) transfers oil from the main tank (Figure 2.1-2), via a non-return valve in the suction pipe (Figure 2.2-2), to the calibration reservoir (Figure 2.2-3) until the level sensor (Figure 2.2-4) in the calibration reservoir signals that it is full. The suction phase is followed by an injection phase by changing the direction of rotation of the pump motor. During the fixed 5 minutes injection phase the pump transfers the oil from the calibration reservoir, via a non-return valve in the outlet coupling (Figure 2.2-6), to the sump of the engine (Figure 2.4). The level sensor in the calibration reservoir should signal a status change from full to empty, in order to prevent an injection error message.

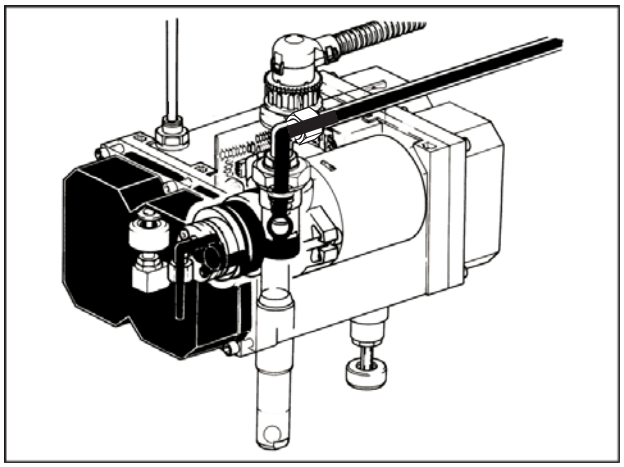

Figure 2.4 Replenishing the oil in the engine

Dependent on the needed quantity of oil the Oilmaster performs one or more pump cycles (as set in the control unit).
The main tank is also fitted with a level sensor (Figure 2.2-7). When the level in the main tank becomes low, this level sensor will report that fact to the control unit, which in its turn will warn the driver by the signal light (Figure 2.1-3) on the dashboard.

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2.3 The signal light

Figure 2.5 Signal light

The signal light on the dashboard keeps the driver informed on how the Oilmaster is functioning.

NOTE
The functioning of test push-button is optional and standard not wired.

2.3.1 Signals of the signal light

Ignition setting

Signal	*Moment*	*Significance*
1 or 2 flashes (1-sec. ON/OFF)	After powering ignition Powering pump connector pin 1 (red wire) and or pin 3 (red/ yellow wire). **Note:** In most installations pin 1 and 3 are interconnected and powered the moment ignition is switched ON, showing 2 flashes (for each powered pin 1 flash).	Confirmation that: • the signal lamp is OK • the fuse of the power lead to pin 1 and or 3 are OK • there is no valid error to report • Oilmaster is stand-by
5 flashes (2sec. ON/OFF)	After powering ignition	Low level in the main tank.
Continuous on	After powering ignition	• Main tank empty • A filling cycle failed due to an ambient temperature below -25°C. • Other malfunction has occurred that made the filling cycle fail.

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Neutral of interval setting

Signal	*Moment*	*Significance*
1 flash (1sec. ON/OFF) followed by 20sec. Rapid flashing (0,2sec. ON/OFF)	After powering ignition Powering pump connector pin-1 (red wire).	Confirmation that: • the signal lamp is OK • the fuse of the power lead to pin 1 is OK • there is no valid error to report • Oilmaster is stand-by
5 flashes (2sec. ON/OFF) followed by continuous flashing (0,2sec. ON/OFF)	After powering ignition	Low level in the main tank.
Continuously on	After powering ignition	• Main tank empty • A filling cycle failed due to an ambient temperature below -25°C. • Other malfunction has occurred that made the filling cycle fail.

ATTENTION
Tap up the oil in the main tank as soon the signal light is flashing or lits continuously with the correct type of oil immediately! And check the oil level in the engine manually.

If the signal light does not flash when switching ON ignition, then check: the functionality of the signal light, the signal light wiring, the fuse in the power lead(s) or the power lead connections.
If the source of a malfunction is neither a wiring problem, nor a low or empty main tank, nor an extremely low ambient temperature and error keeps returning, then contact your Groeneveld dealer.
If you have a (Uni)GINA available, connect it to the control unit to analyse the source of the malfunction. Consult chapter 4. The GINA or user manual UniGINA Oilmaster-1.

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3. Installation

3.1 Overview

To install a Groeneveld Oilmaster the following tasks must be performed:

1. Mounting the sump level sensor and sump coupling.
2. Mounting the Oilmaster.
3. Mounting the line between the Oilmaster and engine.
4. Mounting the line between the sump level sensor and the sump coupling.
5. Mounting the electrical wiring.
6. Testing the system.

3.2 Safety precautions

1. Take the necessary precautions to prevent potentially dangerous situations from occuring during installation, checking and maintenance.
2. Always apply or use adequate safety measures to prevent bodily harm and damage, before you start working on the vehicle.
3. Ensure the vehicle is immobilised before you start work. Remove the ignition key and store it in a safe place. Block parts that may move on their own accord. Engage the parking brake.
4. Pay special attention to tailbords, loading flaps, drop flaps, etc. Take care that you can work safely unter these parts, without these parts can drop down.
5. Never work underneath a vehicle which is raised by a jack only. Always use a trestle and check that the ground is firm and flat enough.
6. Keep in mind that a vehicle with air-suspension may drop of its own accord.
7. Only work underneath the cabin if it is fully tilted (and latched). Otherwise a support must be placed underneath the cabin to ensure the cabin cannot drop back.
8. Disconnect the ground-clamp from the vehicle's battery. This prevents electrical equipment from being inadvertently activated.
9. Adhere to all regulations, specifications and limitations as specified by the manufacturer of the machine, vehicle or engine.
10. Only use clean tools that fit and are designed for the specific task you want to perform with them.
11. A vehicle or machine may only be operated by those who are competent to do so and aware of all possible dangers. If necessary, an expert should be consulted.
12. Keep the environment in which you work clean and tidy. This enhances safety.

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3.3 General installation directives

1. Check the content of the kit using the included parts list.
2. Ensure that prior to the installation the vehicle is on a horizontal surface (not on a slope).
3. Check if you have the correct sump coupling.
4. Determine the optimal location for the Oilmaster, the sump level sensor and the signal light before installing the system. Take account of the weight of the Oilmaster when filled to the max, the accessibility of its filler cap and the manner in which the connections between the Oilmaster and the engine have to be made.
5. Prevent contamination of the system during installation. Work with clean tools and clean the areas on the vehicle or machine where the Oilmaster and the sump level sensor have to be mounted, before you start installing them.
6. During installation of the lines and cables, ensure that:
   - the lines and cables are not mounted onto parts that may become extremely hot, such as the exhaust, retarder, compressor and turbo charger;
   - the lines and cables are routed straight and neatly and are properly fixed in place with cable ties and clamps;
   - the lines are mounted along moving parts have enough slack and are mounted in such manner that, even in the long run, they will not be damaged by abrasion;
   - feed-through rubbers are applied at all locations where the lines and cables could be damaged.

3.4 Sump level sensor and sump coupling

1. Ensure that the vehicle is on a horizontal surface (not on a slope).
2. Drain the motor oil.

ATTENTION

Collect this oil, for re-use or environmentally friendly disposal!

3. Substitute the sump plug by the sump coupling (Figure 3.1). Due to the vast number of screw thread sizes it is important to verify whether the sump coupling in the kit complies with the screw thread in the sump.

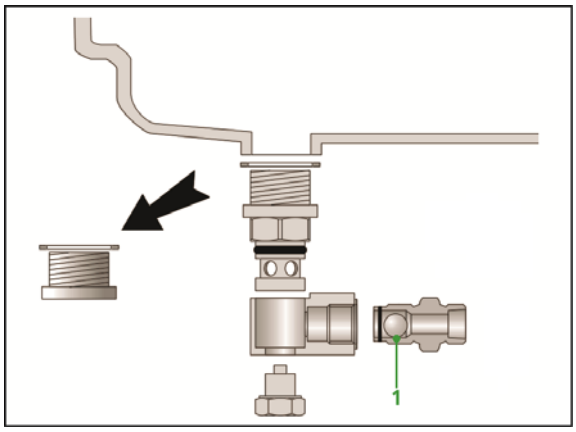

Figure 3.1 Mounting the sump coupling

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4. Assemble and fasten the sump coupling correctly to ensure that it is leakproof and properly locked in the desired direction (Figure 3.2).

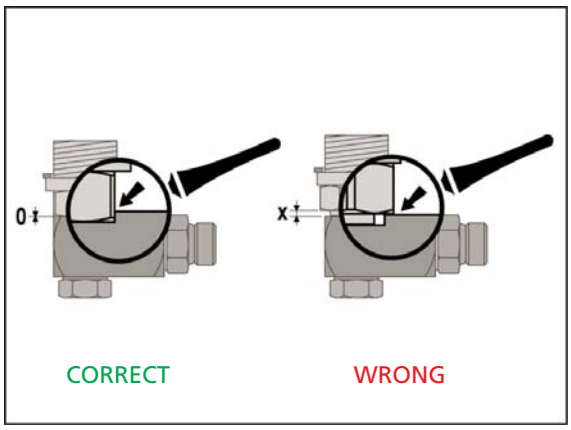

Figure 3.2 Sump coupling

5. Determine the position of the sump level sensor. The correct position is exactly in the centre between the front and the rear of the sump (Figure 3.3) and as close as possible to the side of the sump.

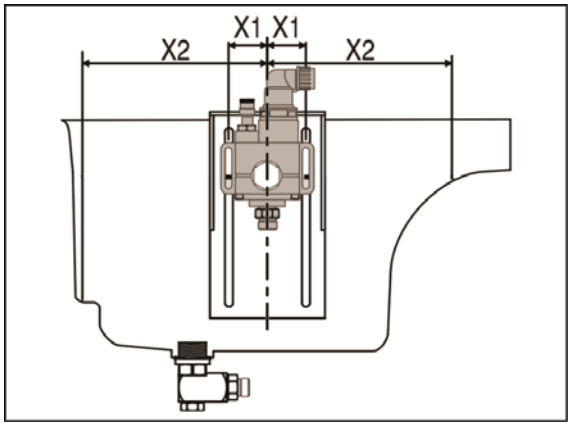

Figure 3.3 Locating the sump level sensor bracket

6. Drill 2 holes in the sump level sensor bracket, that match the size and distance of the bolts used for fastening the sump.
7. Mount the bracket behind 2 of the existing sump mounting bolts.
8. Mount the sump level sensor onto the bracket but do not tighten it yet.
9. Temporarily connect the transparent hose to the sump coupling, using the hose-end fitting with the pipe end for opening the bal valve (Figure 3.1-1) in the sump coupling.

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10. Attach the other end of the transparent hose to the side of the sensor bracket with a cable tie (Figure 3.4). Make sure that the top of this hose sticks out above the imaginary level in the sump.

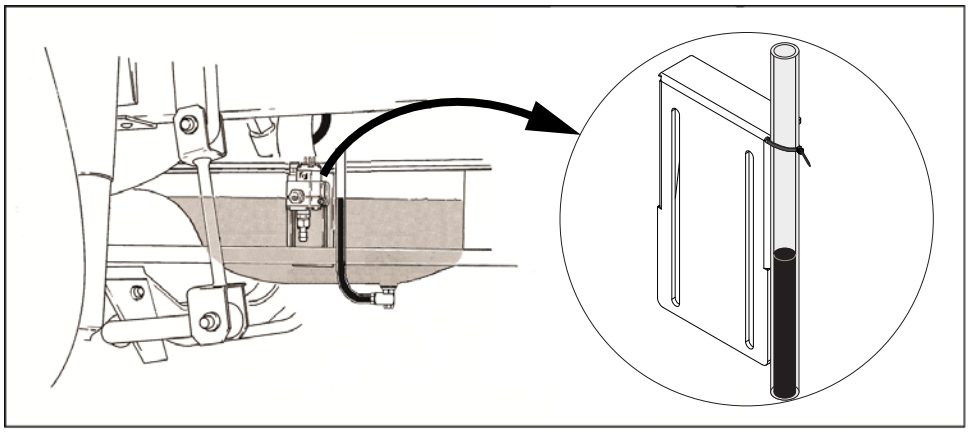

Figure 3.4 Determining the oil level

11. Fill the oil sump till one quarter* above minimum level on the dipstick, with the oil type prescribed by the engine manufacturer.
    ** A higher level only increases the oil consumption of the engine.*
12. Now continue with the installation of the Oilmaster and allow sufficient time (minimal 1 hour) for the final oil level in the transparent hose to level with the oil in the sump (Figure 3.4).

3.5 Mounting the Oilmaster

1. Determine, in consultation with the customer, the most suitable location of the Oilmaster on the vehicle. Take account of:
   - the Oilmaster must be easily accessible (for filling the main tank);
   - the oil level in the main tank must be easy to inspect visually;
   - the Oilmaster should be placed in a position where it cannot be damaged easily.
2. First investigate whether existing mounting holes in the chassis of the vehicle can be used to mount the bracket for the Oilmaster. Always follow the directions of the vehicle's manufacturer when you need to drill new holes. Do not drill additional mounting holes in the flange of the chassis in an effort to fix the bracket even more securely. Be sure not to damage anything (e.g. lines or air-tanks) that may be present behind the part in which you drill. After drilling, always remove the chips (with compressed air or brush).
3. If the bracket for the Oilmaster is to be welded onto the vehicle, the directions of the vehicle's manufacturer should be strictly adhered to.
4. Mount the bracket with the Oilmaster onto the chassis.
5. Remove the transport plugs from the Oilmaster.

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3.6 Electrical wiring

3.6.1 General

Detailed wiring diagrams are available to support correct installation of the electrical wiring. Where possible, pre-assembled harnesses are supplied.

ATTENTION
To prevent damage to the electrical system of the vehicle or machine, the correct fuses must be installed in the power supply circuit (+15 and +30). Consult the wiring diagrams or the tables below for the correct fuse values.

1. Install the harness on the vehicle, between the Oilmaster and fuse box in the cabin, starting by placing the pre-assembled connector (Figure 3.5-2) onto the pump unit.

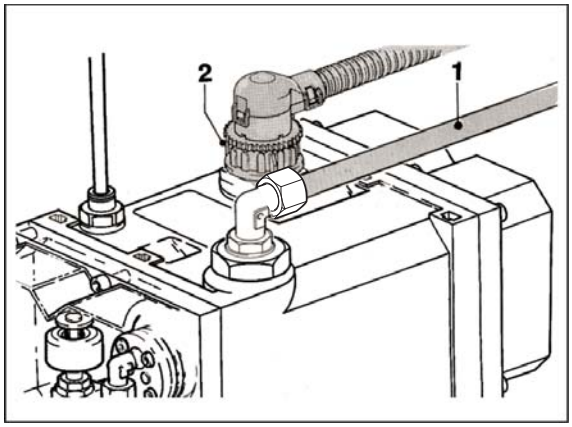

Figure 3.5 Connections on the pump unit

2. Route the harness as much as possible along the harnesses on the vehicle towards the cabin and keep it well clear from heat sources, sharp edges or any other part that may cause damage to the wiring.
3. The standard harness contains 2 wires that need to be routed towards the sump level sensor beside the engine sump. Open the conduit of the harness at a position closest to the sump level sensor.
4. Pull the black and white sensor wire out of the conduit and route them through a third piece of conduit towards the sump level sensor.
5. Mount the Y-adapter (Figure 3.6) between the parted ends of the conduit.

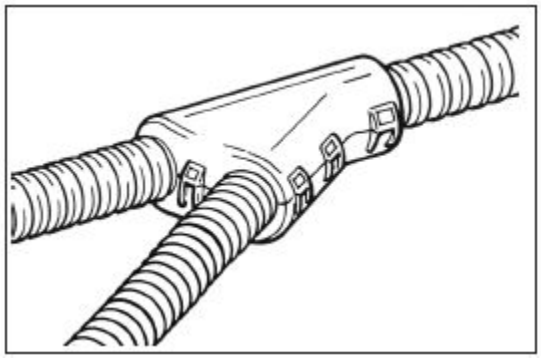

Figure 3.6 Y-adapter

6. Make the required electrical connections as indicated in the wiring diagrams.
7. Mount the signal light at an easy to reach and readily visible location on the dashboard.

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3.6.2 Fuse ratings

Voltage	*Supply circuit fuse (+30)*	*Control circuit fuse (+15)*
12 Vdc	30A	5A
24 Vdc	15A	5A

3.6.3 Pin-layout of the connector on the Oilmaster

Pin no. connector	*Wire colour*	*Description connection*
1	Red	Supply voltage (ignition (+15) or battery (+30))
2	Brown	Ground (-31)
3	Red/Yellow	Control voltage (+15)
4	Green	Signal light (-)
5	Blue	Ground (-31) or connected to the optional wired test push-button (normally closed switch)
6	Grey	K-line (communication with the (Uni)GINA)
7	White	Sump level sensor
8	Black	Sump level sensor

3.6.4 Wiring diagrams

1. Pump unit
2. Level sensor (calibration reservoir)
3. Level sensor (main tank)
4. Control unit
5. Electric gear pump
6. 8-pole connector
7. Sump level sensor
8. K-line (communication line with diagnosis unit)
9. Test push-button (normally closed / only wired optional)
10. Ignition
11. Signal light
12. Battery
13. Relay
14. Cycle counter

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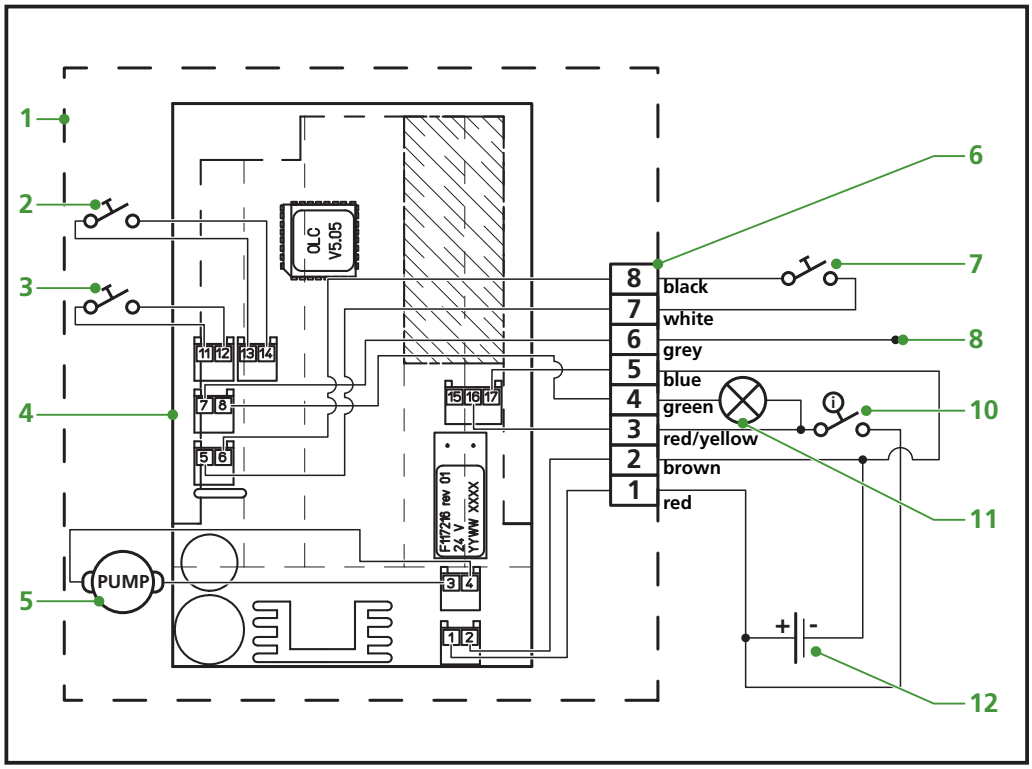

Figure 3.7 Wiring diagram with signal light

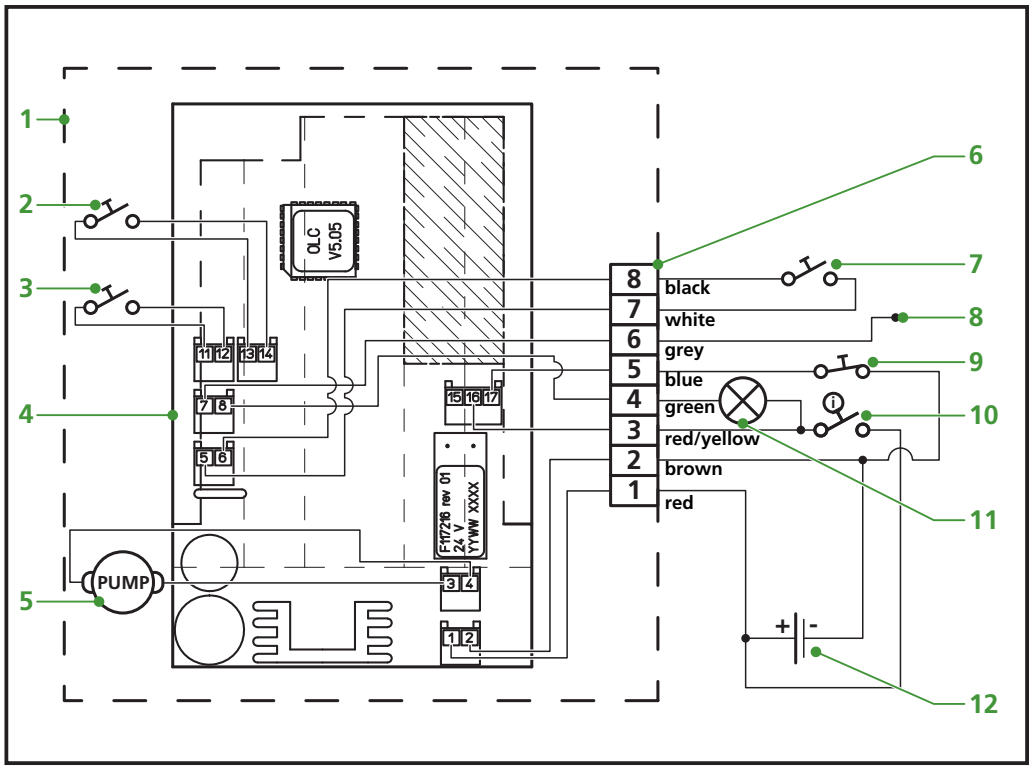

Figure 3.8 Wiring diagram with signal light and wired test push-button

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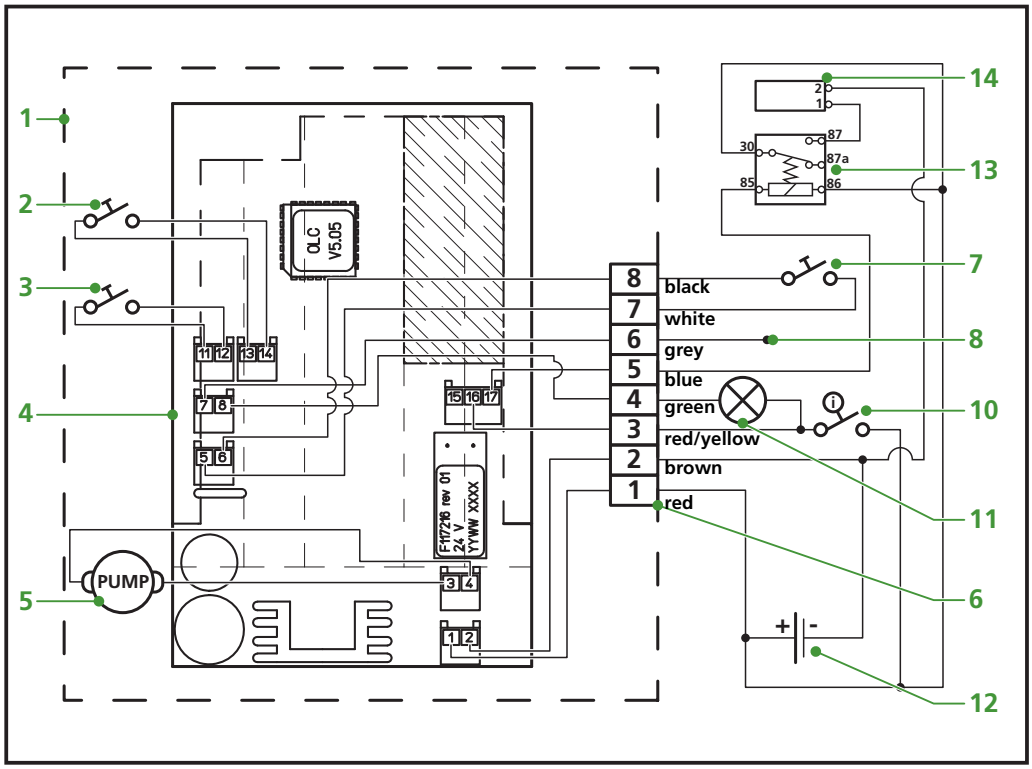

Figure 3.9 Wiring diagram with signal light and cycle counter (special Oilmaster version with cycle counter output)

3.7 Finish the sump level sensor installation

1. Slide the sump level sensor along the bracket until the centreline of the check glass is on the same hight as the oil in the transparent hose (attached to the bracket).

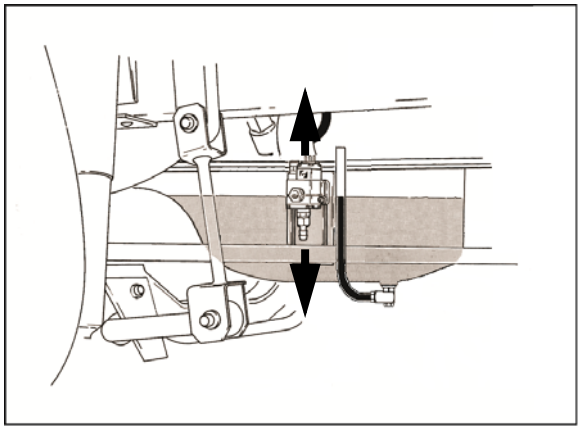

Figure 3.10 Determining location of the sump level sensor

2. Tighten the bolts to secure the sump level sensor at this ideal hight. When the sump level needs to be determined with running engine the sensor can be lowered with approx. 3 mm (when in neutral or interval setting).

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3.8 Connecting the lines

3.8.1 Sump level sensor hose

1. Remove the transparent hose from the sump coupling. The sump coupling is equipped with a ball valve (Figure 3.11-1) that closes the moment the hose end connector is removed. This to avoid excessive oil spill while connecting the final line.
2. Now determine the correct length for the black rubber hose between the sump coupling and the sump level sensor and cut to the right length.
3. Mount the hose-end fittings at both ends and place it in position, starting with the sump level sensor. Keep the sump coupling side for last, because the tip of the hose-end fitting will open the ball valve allowing oil flow towards the sump level sensor.

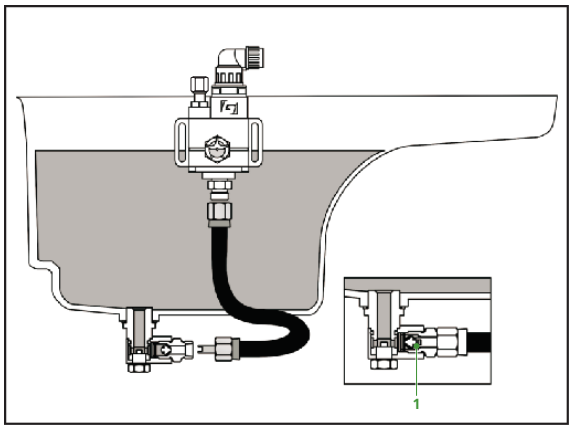

Figure 3.11 Hose between the sump coupling and the sump level sensor

3.8.2 Sump level sensor breather tube

From EURO 4 all engines have closed engine sump breather system. Therefore the breather tube of the sump level sensor must be connected to the engine in order to make sure that any atmospheric pressure inside the engine is transferred to the sump level sensor housing also.

1. Route the breather tube in between the top of the sump level sensor housing and the engine.

ATTENTION
Ensure the breather tube is routed without siphon, to prevent that oil vapour condensates and locks the tube.

2. Disassemble the engine rocker cover when no existing connection above engine oil level is available and determine the best position for a coupling. Now drill a hole to attach the bulkhead coupling (included in the kit).
3. Mount the bulkhead coupling to the rocker cover inside out, in a way that the lock nut is outside the rocker cover and mount an elbow tube coupling in the bulk head for connecting the breather tube.

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4. Replace the rocker cover and connect the breather tube (Figure 3.12).

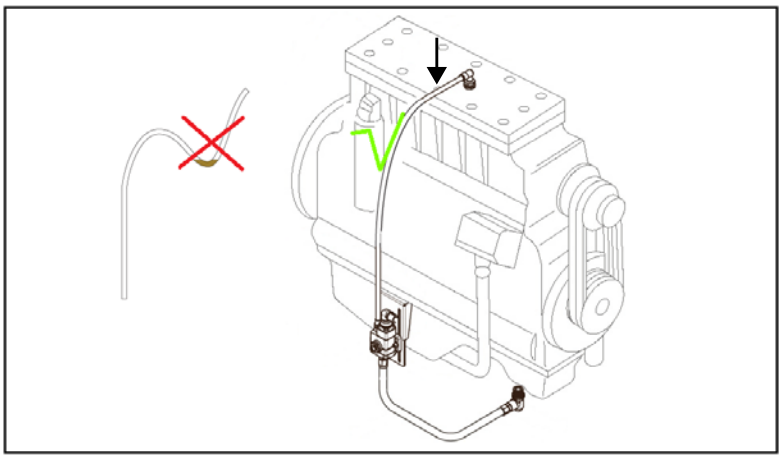

Figure 3.12 Connecting the PA breather tube on the sump level sensor

3.8.3 Engine filler tube

1. Route the PA filler tube in between pump-unit and engine. Disassemble the engine valve rocker cover when no existing oil fill connection above engine oil level is available and determine the best position for a coupling. Now drill a hole to attach the bulkhead coupling (included in the kit).
2. Mount the bulkhead coupling to the rocker cover inside out, in a way that the lock nut is outside the rocker cover and mount an elbow tube coupling in the bulk head for connecting the filler tube.
3. Replace the rocker cover and connect the filler tube (Figure 3.13).

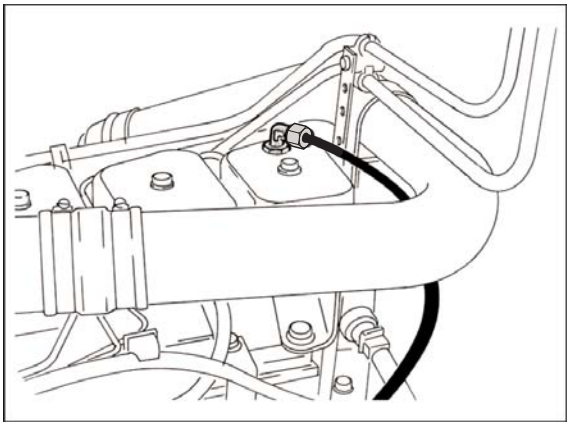

Figure 3.13 Connecting the PA filler tube

3.9 Determining when the Oilmaster has to check the sump level

In case the default ignition setting (moment for checking the oil level in the sump) is not suitable for the installed vehicle, you can alter this with a (Uni)GINA.

The options are:

1. **Ignition setting, created for transport vehicles that do not run continuously**
   The Oilmaster checks the sump level in a split second when vehicles ignition is switched on (engine not yet running). When it detects a LOW-level, while the engine has been switched off long enough, the Oilmaster considers it a valid* LOW and starts a filling cycle.
   * A low level measurement becomes valid when engine has been switched-off long enough to allow sufficient time for the oil to return to the sump. The standard Oilmaster has a fixed 3

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hour engine switch-off delay time. In case the vehicle is not stopped for 3 hours a day without interruption, there is also a 1 hour engine switch-off delay.

2. **Neutral setting, created for vehicles that run continuously**
   The Oilmaster checks the sump level after the vehicle has been in neutral gear for a predetermined time* (with running engine).
   * This predetermined time of 5 minutes, for making sure that oil movement in the sump is stabilized before measurement, can be altered with a diagnosis device (0 to 252 minutes)
3. **Interval setting (or stationary setting), created for GEN sets that run continuously**
   The Oilmaster checks the sump level each time after a predetermined time interval* (with running engine).
   * This predetermined time interval can be altered with a diagnosis device (0 - 59 minutes and or 1 - 127 hours). For the reason that GEN-sets are on a stable platform, the oil in the sump does not need to be stabilized before measurement.

3.10 Pump cycle test

NOTE
Works in combination with a test push-button (if wired) or (Uni)GINA.

Use this test carefully. Each time you execute this test oil will be added to the engine, probably without this being necessary. Performing a test:

1. Fill the main tank of the Oilmaster with engine oil.
2. Check all the oil lines and connections for leakage.
3. Switch the ignition ON.
4. Start a cycle test with the (Uni)GINA. The pump cycle test will be executed, regardless of the oil level in the sump of the engine.

ATTENTION
If you switch the ignition off during the pump cycle, and subsequently switch it on again, the interrupted pump cycle will automatically be completed.

3.11 Checking the oil level in the sump

NOTE
Works in combination with a test push-button (if wired) or (Uni)GINA.

1. Switch the ignition ON.
2. Depress the test push-button three times within five seconds.
3. If the signal light flashes slowly (2,5 sec. ‘on’ - 2,5 sec. ‘off’), three times, the sump level sensor reports that the oil level is OK.
   If the signal light flashes fast (1 sec. ‘on’ - 1 sec. ‘off’), three times, the sump level sensor reports that the oil level in the sump is too low.

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3.12 Additional instructions Oilmaster compact unit

1. Mount the Oilmaster compact unit always below the lowest level of the liquid in the main tank and as close as possible to the main tank.
2. Mount the replenishment hose between the main tank and compact unit.

ATTENTION

The PA filler tube should have a minimum diameter of ø15 mm.

3. Mount the breather tube from the compact unit and calibration reservoir above the main tank if possible.
4. For mounting and adjustment of the sump level sensor and electrical connections, see previous paragraphs.
5. For parameter settings for the pump unit see chapter 4. The GINA or user manual UniGINA Oilmaster-1.

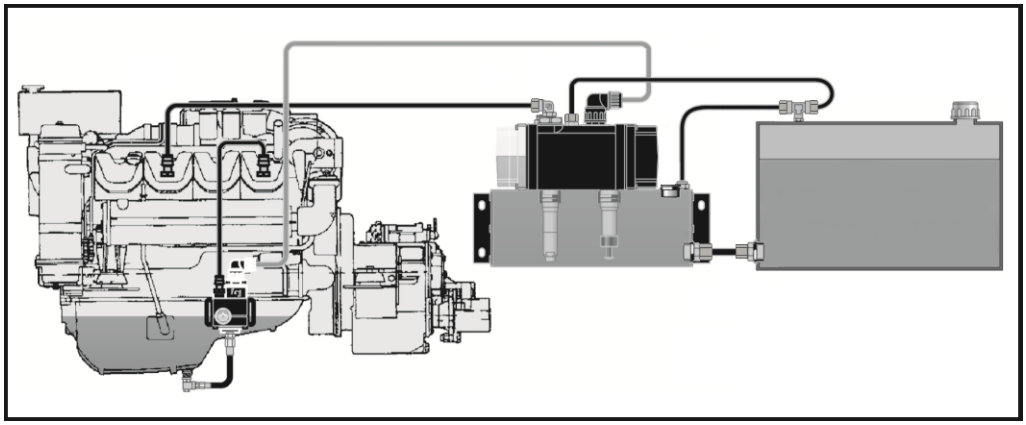

Figure 3.14 The Oilmaster compact unit

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4. The GINA

NOTE
For UniGINA see user manual 'UniGINA Oilmaster-1'.

4.1 Introduction

The GINA (**G**roeneveld tester for **In**stallation and **A**nalysis) is a programming and read-out device for the digital control unit of the Oilmaster.

Figure 4.1 GINA

In the description that follows all screens of the GINA are dealt with in the order in which they have been placed in its menu system. To get acquainted with the menu system and the features the GINA offers, we advise you to follow the sequence as presented, if only once. In practise there is, of course, no reason whatever for such a rigid and time consuming approach.

The read-outs and setting have been grouped in three menus: main menu, parameters timer and diagnosis menu. You can access each of these menus by pressing <MAIN>, <PARAMETERS> or <DIAGNOSIS> on the keypad of the GINA.
You can do so at any time, regardless of the screen currently shown on the display.

Some screens just show information. You cannot change anything in those screens. Other screens allow you to change parameters or the status of a particular input or output. You can recognise those screens by the blinking cursor that appears on them (with the exception of the system configuration and error-logging-reset screens).
A number of screens show the current time in their top-right corner. In the screens, as reproduced in this manual, this is indicated by **hh:mm:ss**.
Values are usually denoted to by a number of **x**-signs, with one '**x**' for every possible digit in the number.

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4.2 Connecting the GINA

The supply voltage of the control unit to be read or programmed must be available (from the vehicle or an external power supply, if needed).
Connect the GINA with the control unit, using the supplied interconnection cable.

4.3 Control pad

Key	*Function*
<POWER ON/OFF>	to turn the GINA on or off (toggle)
<F1> .. <F4>	('soft keys') to make a particular choice in a menu
<0> .. <9>	to enter numerical data
<MAIN>	to call the main menu to view miscellaneous information
<PARAMETERS>	to call the parameter menu to view and enter parameter data
<DIAGNOSIS>	to call the diagnosis menu to view various system data
<NEXT>	to go to the next screen in the menu system
<ENTER>	to confirm a setting you have changed or entered

4.4 Switching on the GINA

The GINA can be switched-on after:

- the GINA has been connected with the control unit, and
- the power supply has been available to the control unit for at least 8 seconds.

Press <POWER ON/OFF>.

You can access the main menu, parameters timer and diagnosis menu by pressing, respectively <MAIN>, <PARAMETERS> or <DIAGNOSIS>.

This message appears when the GINA is unable to communicate with the control unit:

Communication error

This can be cause by:
- bad connection (wire in cable broken or bad connector).
- GINA switched-on too quickly.

Always try to alleviate the problem first by turning the GINA off and then on again, or by pressing one of the softkeys (<F1>, <F2>, <F3> or <F4>).

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This message appears if the control unit is not supported by this GINA:

You need another GINA to access this control unit.

When you switch on the GINA, you will see this screen. GINA restarts the electronic unit of the OILMASTER, and reads out the variable data.

When the GINA display this screen, it means that the software is ready for use.

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4.5 Main menu

Press <**main**>

```
MAIN MENU


info   time   contr
```

The main menu contains various data about the GINA and the control unit that is connected. You can change only some of the data.

Press <F1> (**info**)

```
INFO
User ID
last access: xxxxxx
u-ac   d-ac   u-ch   d-ch
```

The screen shows the identification number of the person who most recently connected a GINA to this control unit.

ATTENTION: This number is overwritten when the GINA is switched off, with your own indification number.

Press <F2> (**d-ac**)

```
INFO
Time&date , last access
xx-xx-xx      xx:xx
u-ac   d-ac   u-ch   d-ch
```

The screen shows the date and time at which a GINA has, most recently, been connected with this control unit.

ATTENTION: This date and time will be updated when you switched-off the GINA.

Press <F3> (**u-ch**)

```
INFO
User ID
last change: xxxxxx
u-ac   d-ac   u-ch   d-ch
```

The screen shows the identification number of the person who, most recently, changed any settings of this control unit.

ATTENTION: This number will be overwritten with your own identification number when you switch-off the GINA, provided you have changed at least one setting.

Press <F4> (**d-ch**)

```
INFO
Time&date , last change
xx-xx-xx      xx:xx
u-ac   d-ac   u-ch   d-ch
```

The screen shows the date and time at which the settings of this control unit were most recently changed.

ATTENTION: This time and date will be updated when you switch-off the GINA, provided you have changed at least one setting.

Press <NEXT>

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INFO
Software-version
Prog unit: xxxx
p-s p-ui acces

The screen shows the version number of the software in this GINA.

Press <F2> (**p-ui**)

INFO
User ID
Prog unit: xxxx
p-s p-ui acces

The screen shows the identification number of the registered user of this GINA.

Press <F3> (**acces**)

NOT AVAILABLE

This screen is not available.

Press 2x <NEXT>

text vers. xxxxx103
February 97

The screen shows the version number of the display texts in the software of the GINA.

Press <MAIN>

MAIN MENU

info time contr

The main menu contains various data about the GINA and the control unit that is connected. You can change only some of the data.

Press <F2> (**time**)

TIME
Enter hours
xx
hrs min

The screen shows the hours of the current date and time. You can change this setting with the numeric keys. Confirm the new setting with <ENTER>.

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Press <F2> (**min**)

TIME
Enter minutes
xx
hrs min

The screen shows the minutes of the current date and time. You can change this setting with the numeric keys. Confirm the new setting with <ENTER>. As soon as you press <ENTER>, the seconds will start running at zero.

Press <NEXT>

DATE
Enter day
xx
day mnth year

The screen shows the day of the month of the current date and time. You cannot change this setting.

Press <F2> (**mnth**)

DATE
Enter month
xx
day mnth year

The screen shows the month of the current date and time. You cannot change this setting.

Press <F3> (**year**)

DATE
Enter year
xx
day mnth year

The screen shows the year of the current date and time. You cannot change this setting.

Press <MAIN>

MAIN MENU

info time contr

The main menu contains various data about the GINA and the control unit that is connected. You can change only some of the data.

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Press <F3> (**contr**).

MAIN MENU
Adjust contrast

- **+**

The contrast of the display may be increased or decreased in this screen.
Press <F1> (-) to lower the contrast or <F4> (+) to raise it.

4.6 Parameters timer

The parameters timer menu contains the parameter settings for the Oilmaster. You can view and/or change these parameters, provided you have the correct 'access level'.

Press <**parameters**>

PARAMETERS

CHG

The screen shows the parameters menu.

Press <F1> (**CHG**)

Max. successive pmp cycles
xxx units
fill main misc tneu

The screen shows the number of pump cycles which will be consecutively started, if the sump level sensor indicates a low oil level in the engine sump.

If necessary, change this setting with the numeric keys and confirm with <ENTER>.

Press <F2> (**main**)

NOT AVAILABLE

This screen is not available.

Press <F3> (**misc**)

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Miscellaneous

x x x x
MB ign neutr npol

The screen shows the current Oilmaster setting.
0 = non-active; 1 = active
MB= Special customer setting.
Ing= Transport setting (for trucks and busses). Here, the Oilmaster measures the sump oil level when the contact switch is switched on.
The sump level sensor has to be adjusted at correct level with engine switched off (at least 180 minutes).
When the contact switch has been switched off for 60 or 180 minutes (depends on type of Oilmaster).
Neutr= Neutral position setting (industrial application).
Here, the Oilmaster measures the sump level, when the gear lever has been placed in the neutral position specified pre-determined time. Level of the sump level sensor with running engine.
Npol= Polarity of the neutral position signal (to be measured with a Multi-meter).
If the neutral position is positive when neutral is selected, npol = 1.
If the neutral position is negative when neutral is selected, npol = 0.
If none of these four functions is activated, an idling setting is automatically issued, whereby the Oilmaster measures each time after a specific preset period. Level of the sump level sensor set with running engine.

Press <NEXT>

Neutral switch delay time
xxx min
fill main misc tneu

The screen shows the delay time in minutes for the neutral position version. The Oilmaster only measures the oil level if neutral has been selected for this period.
The standard value is 5 minutes.
If necessary, change this setting and confirm with <ENTER>.

Press <NEXT>

Hours cycle on time

xxx h
cy_h cy_m %cyc psmp

This screen shows the delay time in hours after which the Oilmaster measures the oil level in idling version.
The standard value is 12 hours.
If necessary, change this setting and confirm with <ENTER>.

Press <F2> (**cy_m**)

Minute cycle on time

xxx min
cy_h cy_m %cyc psmp

This screen shows the additional time in minutes after which the Oilmaster measures the oil level in idling version.
The standard value is 30 minutes.
If necessary, change this setting and confirm with <ENTER>.

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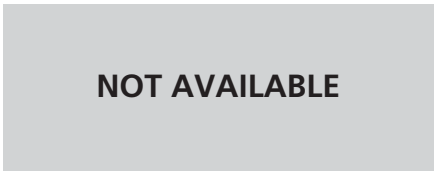
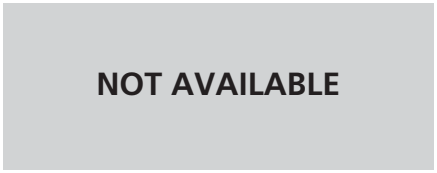
Press <F3> (**%cyc**)



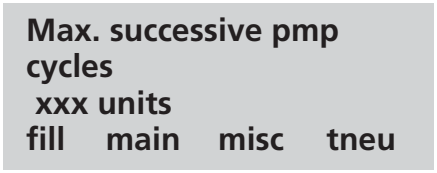
This screen is not available.

Press <F4> (**psmp**)



This screen is not available.

Press <F4>



You are returned in the first parameter screen.

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4.7 Diagnosis menu

Press <**diagnosis**>

DIAGNOSIS MENU			
I/O	**err**	**misc**	**info**

The diagnosis menu shows various pieces of information concerning the current status of the Oilmaster, such as error messages and the status of its input and output signals.

Press <F1> (**I/O**)

DIAGNOSIS			
I/O			
stat	**drv**		

The screen shows the INPUTS / OUTPUTS menu.

Press <F1> (**stat**)

DIAGNOSIS			hh:mm:ss
Inputs (1)			
x	x	x	x
dlmn	sw	res	res

The screen shows four various input signals.

dlmn= "delayed" signal main tank empty (1= full, 0= empty).

sw= status of test push-button (in-cab) (0= closed; 1= open). when switch not wired it should show 0. Blue wire is connected directly to ground.
NOTE: the test push-button is Normally Closed.

res= spare, has no function.

res= spare, has no function.

You cannot change these settings.

Press <NEXT>

DIAGNOSIS			hh:mm:ss
Inputs (2)			
x	x	x	x
main	aux	fill	ocp

The screen shows the second four various input signals.

main= level sensor main tank (0= low level; 1= full).

aux= level sensor calibration reservoir (0= more than half full; 1= empty).

fill= signal for specific customer version.

ocp= pump overload (0= normal load; 1= overload).

You cannot change these settings.

Press <NEXT>

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DIAGNOSIS	hh:mm:ss
Inputs (3)	
x	x x x
cart	eaux neut ign

The screen shows the third four various input signals.

cart= engine sump level (0= below level; 1= on level).

eaux= error during calibration reservoir replenishment. This error can occur during a second or subsequent pump cycle, once the maximum pump time has been reached, whilst the level sensor in the calibration reservoir has still not switched, and the main tank is "low (=empty tank)". (0= no error occured; 1= an error occured).

neut= neutral position (0= gear selected; 1= neutral position).

ign= after ignition (0= off; 1= on).

You cannot change these settings.

Press <NEXT>

DIAGNOSIS	hh:mm:ss
Outputs (1)	
x	x x x
pmp	suc lmp res

The screen shows the four various output signals.

pmp= pump activation (0= not activeted; 1= activeted).

suc= pump rotation direction (0= pump pumping oil from calibration reservoir to engine sump; 1= pump draws oil in from main tank to calibration reservoir).

lmp= lamp (0= off; 1= on).

res= spare.

You cannot change these settings.

Press <DIAGNOSIS>

DIAGNOSIS MENU	
I/O	err misc info

The screen shows the DIAGNOSIS menu.

Press <F1> (**I/O**)

DIAGNOSIS
I/O
stat drv

The screen shows the INPUTS / OUTPUTS menu.

Press <F2> (**drv**)

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DIAGNOSIS hh:mm:ss
Drive outputs (1)

x	x	x	x
pmp	**suc**	**lmp**	**strt**

The screen shows the drive outputs menu.
On condition that the installation is not carrying out a cycle, on this screen, you can manually operate the Oilmaster. You can switch the functions with the relevant function keys.

pmp= pump status (0= off; 1= on).

suc= pump rotation direction (0= pump pumping oil from calibration reservoir to engine sump; 1= pump draws oil in from main tank to calibration reservoir).

NOTE: Do not reverse the direction of pump rotation if the pump is switched on. This could damage the relay in the Oilmaster. First switch off the pump with <F1>, reverse the direction of rotation of the pump, and switch the pump back on.

lmp= lamp (0= off; 1= on).

strt= start a cycle.

Press <DIAGNOSIS>

DIAGNOSIS MENU

I/O	err	misc	info

The screen shows the DIAGNOSIS menu.

Press <F2> (**err**)

DIAGNOSIS
Error bits (1)

x	x	x	x
oil	**saux**	**iaux**	**ctof**

The screen shows the possible error messages which can be detected by the system, and which are also stored by the electronics.
The screen shows the four possible errors
(0= no system error; 1= error occured).
After repairing the system, you can delete the error by pressing the relevant function key and confirming with <ENTER>.

oil= unimportant message.

saux= Level sensor in calibration reservoir did not switch from low to half: error during suction phase.

iaux= Level sensor in calibration reservoir did not switch from half to low: error during pumping phase to engine sump.

ctof= more than 6 consecutive valid low sump level measurements.

Press <NEXT>

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DIAGNOSIS
Error bits (2)

x	x	x	x
mnau	**main**	**fill**	**ocp**

The screen shows the possible error messages which can be detected by the system, and which are also stored by the electronics.
The screen shows the four possible errors
(0= no system error; 1= error occured).
After repairing the system, you can delete the error by pressing the relevant function key and confirming with <ENTER>.

mnau= error message during a suction phase: maximum pump time to half exceeded in combination with low level in main tank. This error is explained as empty main tank.
main= main tank level low.
fill= special customer version: too many consecutive "low sump level" messages.
ocp= pump motor over current.

Press <DIAGNOSIS>

DIAGNOSIS MENU

I/O err misc info

The screen shows the DIAGNOSIS menu.

Press <F3> (**misc**)

DIAGNOSIS
val. immd after ign.

x	x	x	x
cart	**hlf**	**res**	**res**

The screen shows a number of data relating to the situation immediately following the contact being switched on:
cart= engine sump level status (0= ok; 1= low level).
hlf= indication of whether the contact has been switched off for more than half a hour (0= half hour not achieved; 1= half hour achieved).
res= spare
res= spare

Press <NEXT>

DIAGNOSIS
Tot. drv pump
xxxxx units

drv stat cyc cart

This screen shows the total number of completed pump cycles.

Press <F2> (**stat**)

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This screen is not available, <F3> is also not available.

```
NOT AVAILABLE
```

Press <F4> (**cart**)

This screen shows the total number of low sump level messages displayed by the sensor.

```
DIAGNOSIS
low oil cart level
  xxxxx units
drv    stat    cyc    cart
```

Press <NEXT>

The screen shows the pump time in whole minutes, once a pump cycle has started.

```
DIAGNOSIS      hh:mm:ss
Pmp time min
 xx
min    sec
```

Press <F2> (**sec**)

The screen shows the additional pump time in seconds after a pump cycle has started.

```
DIAGNOSIS      hh:mm:ss
Pmp time sec.
 xx
min    sec
```

Press <DIAGNOSIS>

The screen shows the DIAGNOSIS menu.

```
DIAGNOSIS MENU


I/O    err    misc    info
```

Press <F4> (**info**)

The screen shows the part number of the Oilmaster.

```
PRODUCTION INFO
Part number
 xxxx
prno   srno   cver
```

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Press <F2> (**srno**)

PRODUCTION INFO
Serial number
xxxxxxxxxx
prno srno cver

The screen shows the serial number of the Oilmaster (this is not always the same number as the serial number on the type plate).

Press <F3> (**cver**)

PRODUCTION INFO
Config. number
xxx
prno srno cver

The screen shows the version number of the software for the Oilmaster.

All screens have now been visited. If you have completed reading or programming the control unit, you can switch-off the GINA.

Press <POWER ON/OFF> and disconnect the interconnection cable and remove the GINA.

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4.8 Layout of the menu system

4.8.1 Used abbreviations

Abbreviation	*Meaning*
-	minus (decreasing contrast)
+	plus (increasing contrast)
access	authorisation level
aux	calibration reservoir level sensor
auto	automatic
cart	engine sump level
chg	change
contr	screen contrast
ctof	more than 6 consecutive “low sump level” messages
cyc	cycles
cy_h	cycle houres on time
cy_m	cycle minutes on time
cver	configuration version
d-ac	time & date, last access
d-ch	time &date, last change
day	day
dlmn	delayed signal main tank empty
drv	drive
eaux	error during calibration reservoir replenishment (suction error)
err	errors
fill	signal for specific customer version
hlf	indication whether the contact has been switched off for more than half a hour
hrs	hours
iaux	injection phase: emptying calibration reservoir to engine sump
I/O	inputs/outputs
ign	ignition
info	information GINA
lmp	lamp
main	main tank
mb	specific customer version
min	minutes

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Abbreviation	*Meaning*
mnau	maximum pump time to half reached: low level in main tank (= tank empty)
mnth	month
neut	neutral
neutr	neutral
npol	neutral position sump level sensor
ocp	overload pump
oil	oil
p-s	software-version GINA
p-ui	user id GINA
pmp	pump
prno	part number
res	spare
saux	suction phase (filling calibration reservoir)
sec	second
srno	serial number
stat	statics
strt	start
suc	pump rotation in suction direction
sw	switch
text vers.	text version, software GINA
time	time
u-ac	user id, last access
u-ch	user id, last change
year	year

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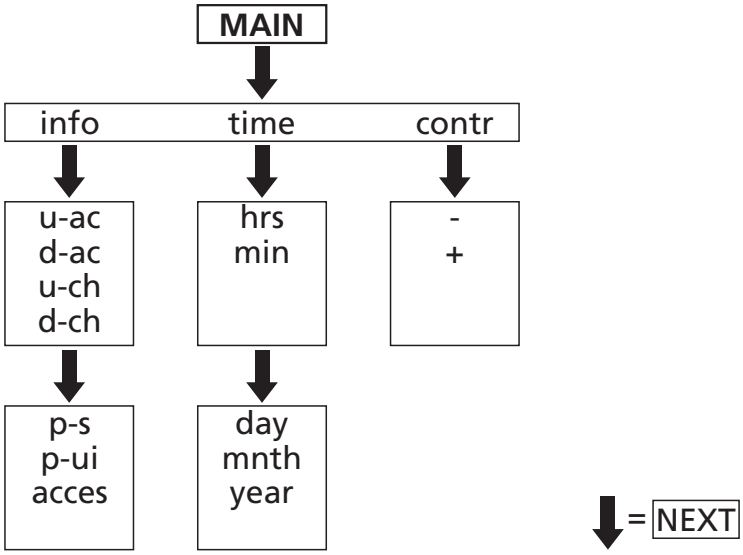
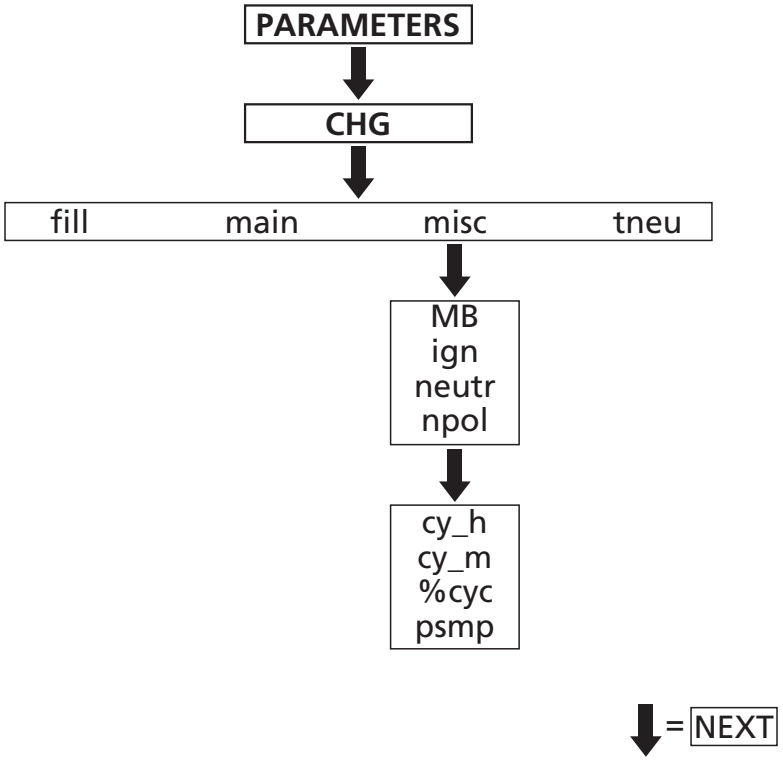
4.8.2 Main menu



4.8.3 Parameters menu



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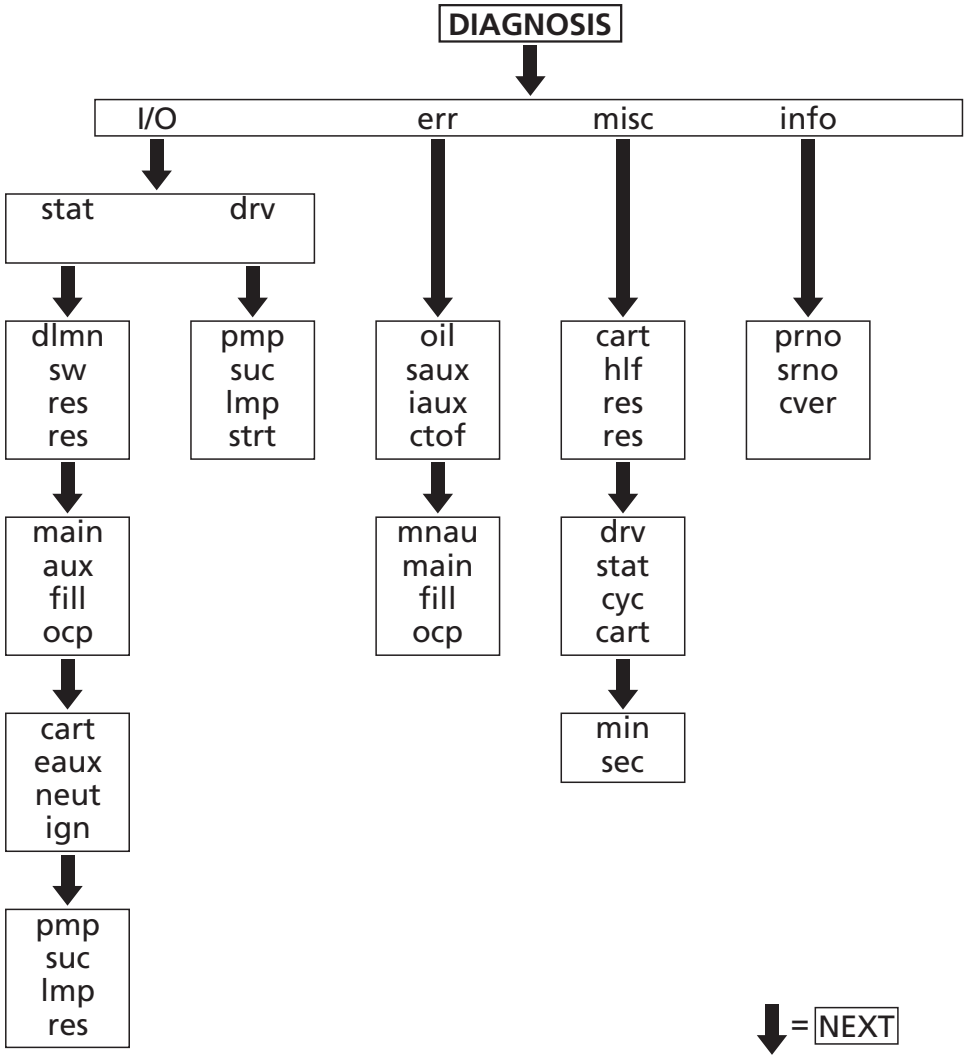
4.8.4 Diagnosis



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5. Technical data

Operating temperature	: -25 ... +80 °C
Supply voltage	: either 12 or 24 Vdc
Power consumption pump motor 12 Vdc (nominal at 20°C and 15W40 oil)	: 4 A
Power consumption pump motor 24 Vdc (nominal at 20°C and 15W40 oil)	: 2 A
Type approval in accordance with the following directives	: ECE-R10 (Rev.4), EN 50498 (2010)
Protection class	: IP67 (for pump unit)

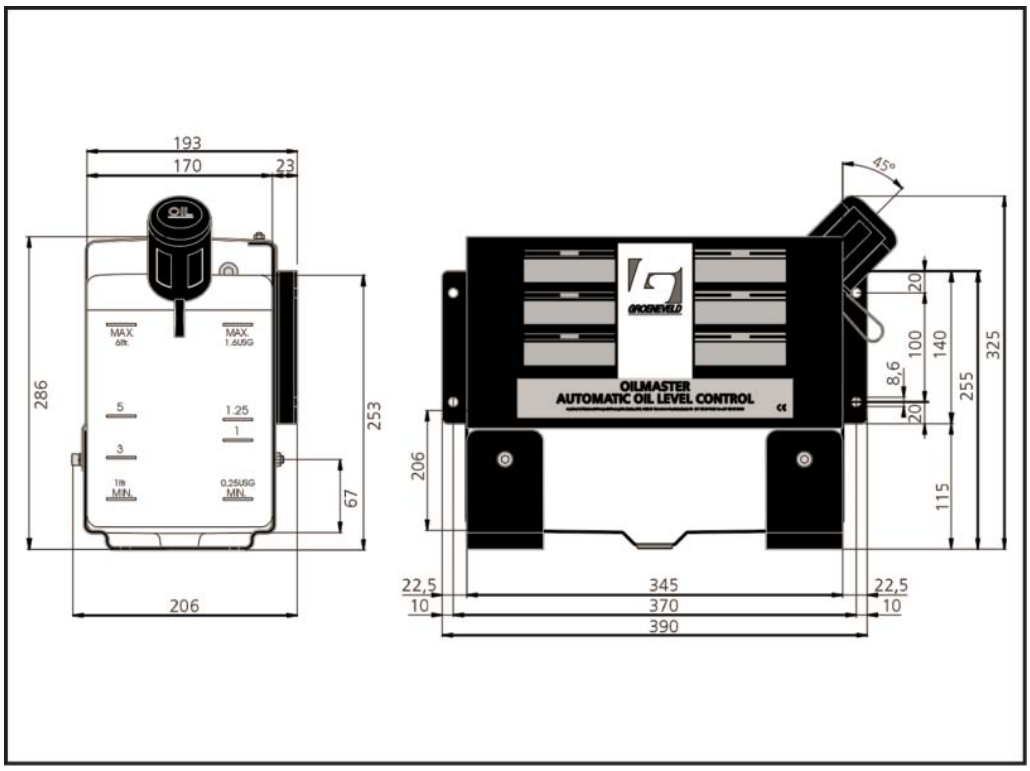

Figure 5.1 Dimensions of the Oilmaster with 6 litre reservoir

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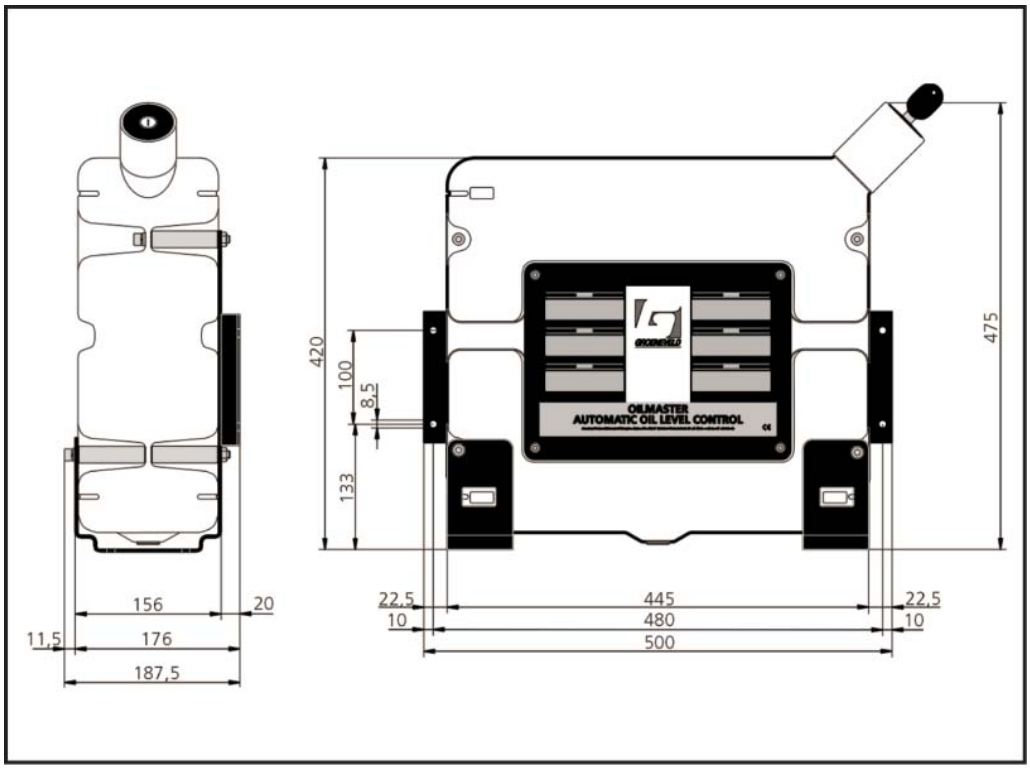

Figure 5.2 Dimensions of the Oilmaster with 12,5 litre reservoir

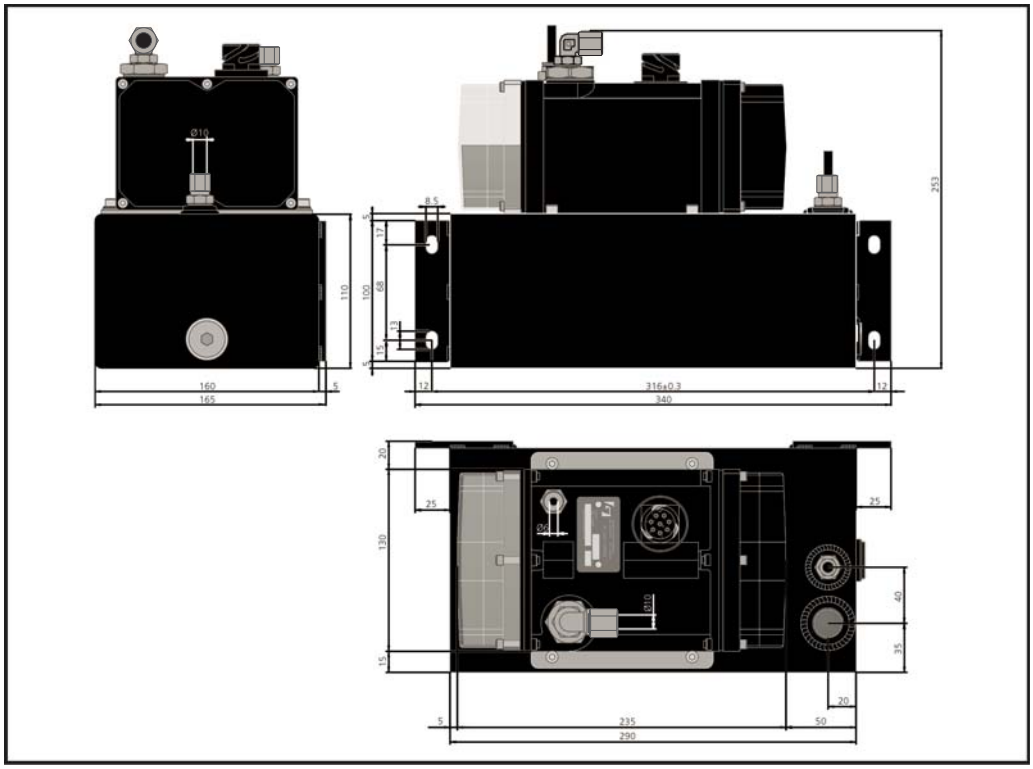

Figure 5.3 Dimensions of the Oilmaster compact unit

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Notes

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