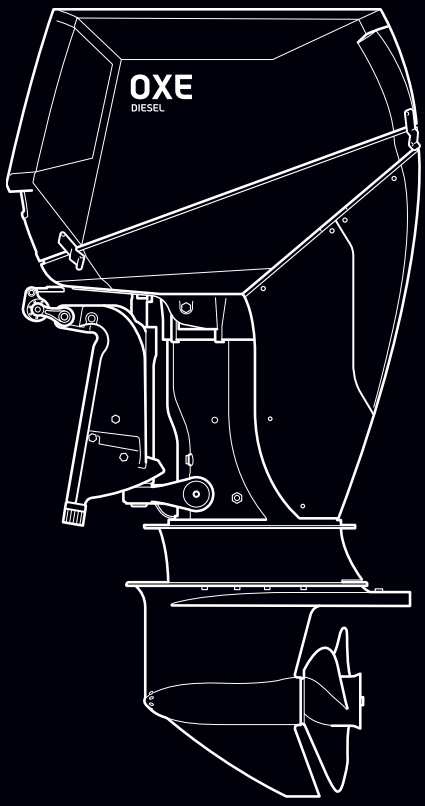

OXE
DIESEL

OXE 125/150/175/200 HP

USER MANUAL

"THE OXE POWER HEAD IS A WELL PROVEN DIESEL ENGINE INHERENTLY MORE EFFICIENT THAN GASOLINE ENGINES CONTRIBUTING TO LOW FUEL CONSUMPTION"

INTRODUCTION

Publication No: ODM1005/B

CONTENT

OVERVIEW

ABOUT THIS MANUAL

This manual provides you with the information you need to know about starting, operating and maintaining your OXE Diesel engine.

Read this manual carefully and learn how to operate your outboard properly. Always contact your dealer if you have any questions.

Using and attending the engine properly will preserve its qualities for a long operating life. Follow the instructions in this manual on operating this engine and carry out inspections as described on a regular basis.

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SAFETY INFORMATION

Safety and operating information that is practiced, along with good common sense, can help prevent personal injury and product damage.

Symbols and signs

DANGER

This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTE! Important information

Rotating parts

DANGER

Rotating parts can cause cuts, mutilation or strangulation.

Hands, feet, hair, jewelry, clothing, PFD-straps, etc. can become entangled with internal rotating parts of the engine or exposed moving parts.

Do note remove or replace the top cover with the engine running.

Hot parts

DANGER

During and after operation, engine parts could be hot enough to cause burns. Do not touch any parts under the top cover until the engine has cooled off.

Electric parts

DANGER

Do not touch any electrical parts while starting the engine. They can cause shock or electrocution.

Engine shut-off switch and cord

DANGER

The purpose of a lanyard stop switch is to stop the engine when the operator moves far enough away from the operator's position to activate the switch.

Attach the engine shut-off cord so that the engine stops if the operator falls overboard or leaves the helm.

When activating the engine shut-off switch the engine will stop immediately, but the boat will continue to coast for some distance depending on velocity and degree of any turn at shut down.

Engine exhaust emissions

WARNING

Inhaling engine exhaust gases can result in carbon monoxide poisoning, which can lead to unconsciousness, brain damages, or death. Avoid exposure to carbon monoxide gas.

Stay clear from exhaust areas when the engine is running. Keep the boat well ventilated.

MODIFICATIONS

WARNING

Do not attempt to modify the outboard. Modifications may reduce safety and reliability, and render the outboard unsafe or illegal to use.

Accessories

Genuine Cimco Marine parts and accessories have been specifically designed and tested for OXE outboards.

Some accessories, not manufactured or sold by Cimco Marine, may not be designed to be safely used with OXE outboards or OXE outboard operating system. Acquire and read the Installation, Operation, Maintenance and Accessories manuals for all selected accessories.

SAFE BOATING

Boater's responsibilities

It is always the operator (driver) that is responsible for the correct and safe operation of the boat and the safety of its occupants and general public. We strongly recommended that each operator reads and understands the entire manual before operating the outboard.

Be sure that at least one additional person onboard is instructed in the basics of starting and operating the outboard and boat handling in case the driver is unable to operate the boat.

Boat horse power capacity

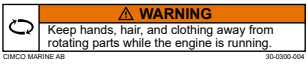
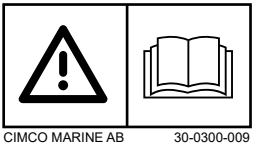
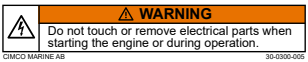
Exceeding the boat's maximum power rating can cause serious injury or death. Any overpowering of the boat can affect boat control and flotation characteristics or break the transom.

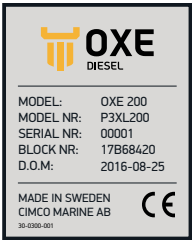
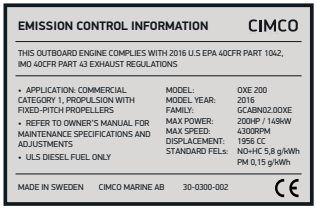
Do not install an outboard that exceeds the boat's maximum power and weight rating.

Boat performance capacity

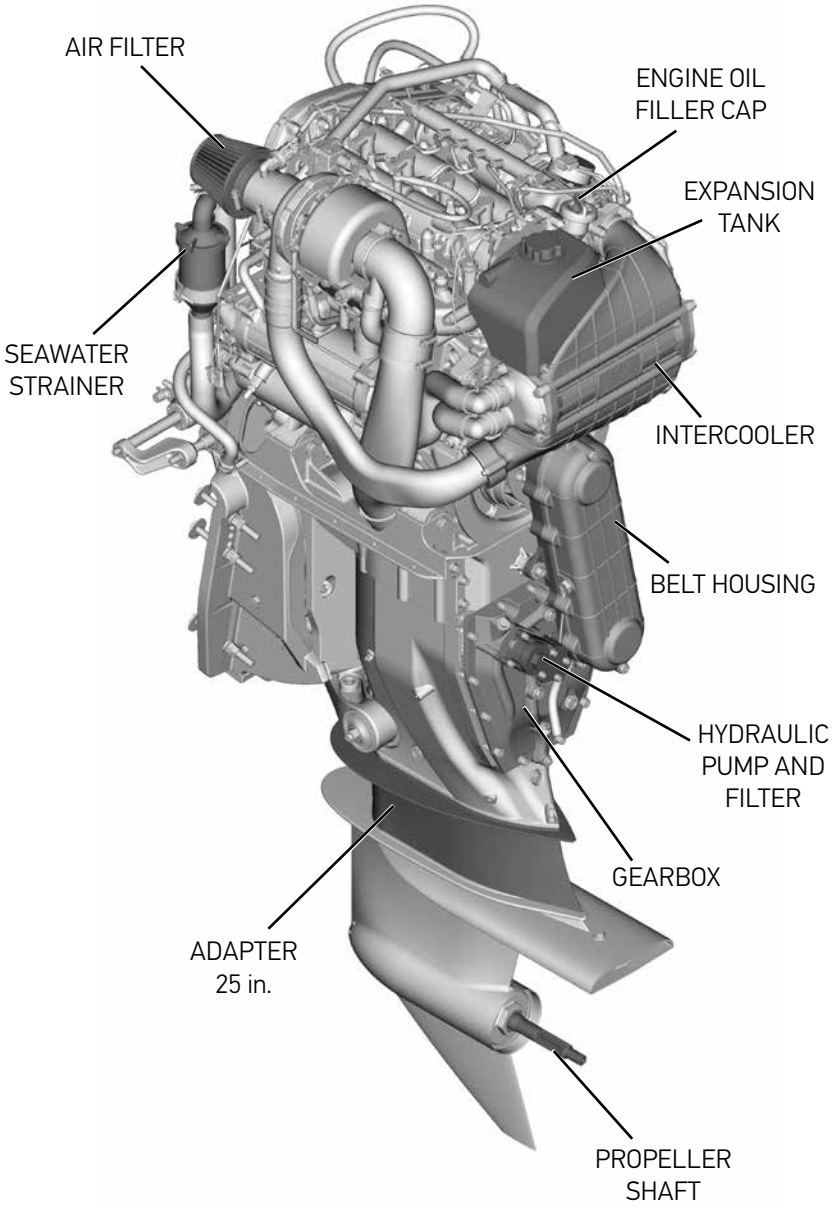
Do not overpower or overload your boat. Most boats will carry a required capacity plate indicating the maximum acceptable power and load as determined by the manufacturer. If in doubt, contact your dealer or the boat manufacturer.

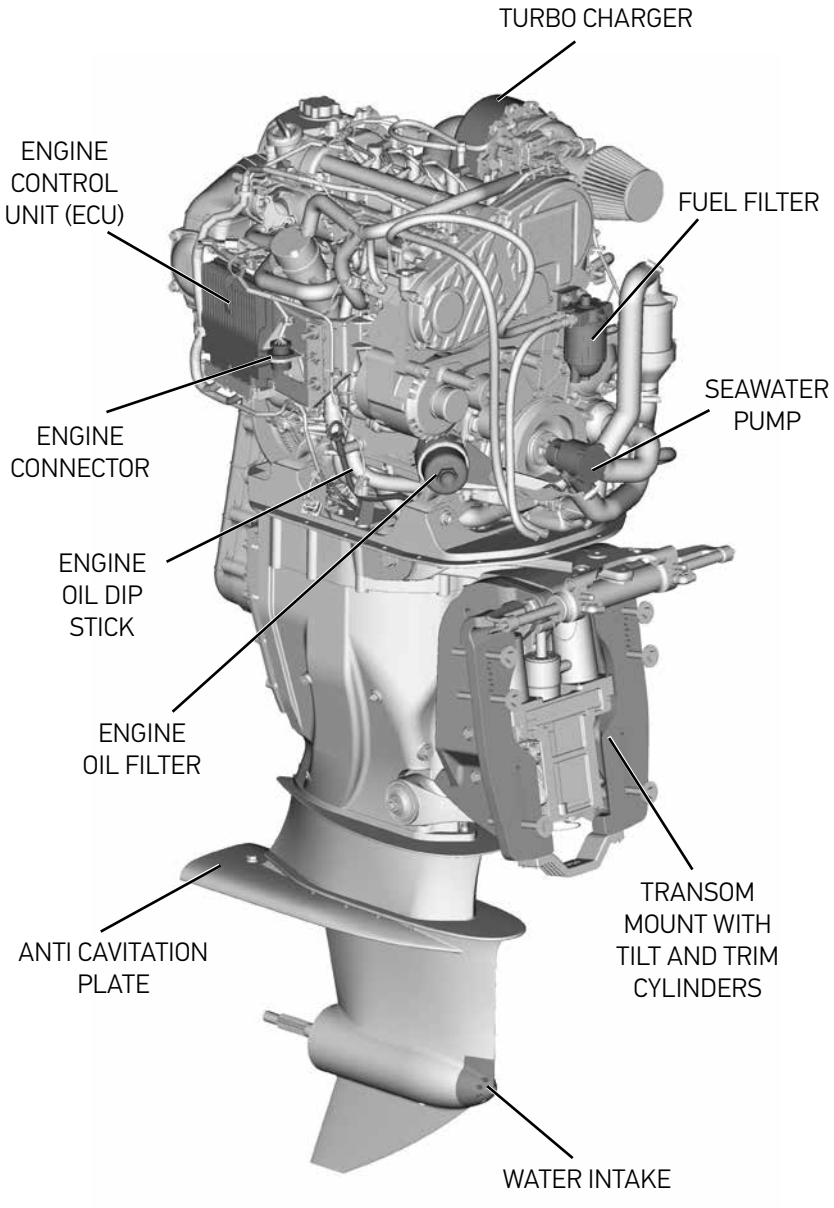
WARNING AND INFORMATION LABELS

Label	Information	Location
Heat warning label  	Warning for hot surfaces, which could result in burns.	1. Placed on the turbo pressure pipe. 2. Placed on the lower part of the intercooler, near the primary belt housing.
Rotation warning label  	Warning for rotating parts.	1. Placed on the lower timing belt cover, on engine front. 2. Placed next to the upper belt housing.
Electrical warning label  	Warning for electrical hazards.	Placed on the ECU-bracket.
Read manual label 1  	A reminder of the importance to read manuals prior to the initial use of equipment or machinery. The manual contains information needed for proper operation, maintenance and care.	Placed on the upper cowling, next to the trim and tilt button.
Read manual label 2  		Placed on top of the timing belt cover.

Label	Information	Location
Read manual label 3 	A reminder of the importance to read manuals prior to the initial use of equipment or machinery. The manual contains information needed for proper operation, maintenance and care.	Hanging underneath the cowl, near the engine connector.
Identification label 		1. Placed on the starboard side of the engine, just below the middle cowling. 2. Placed on page 2 in the Service Book.
Emission label 		Placed on the timig belt cover of the engine's block.

MAIN COMPONENTS



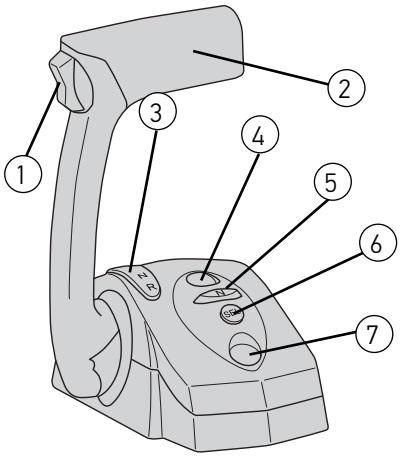

TURBO CHARGER
ENGINE CONTROL UNIT (ECU)
FUEL FILTER
SEAWATER PUMP
ENGINE CONNECTOR
ENGINE OIL DIP STICK
ENGINE OIL FILTER
TRANSOM MOUNT WITH TILT AND TRIM CYLINDERS
ANTI CAVITATION PLATE
WATER INTAKE

INSTRUMENTATION

For instruments and gauges, refer to corresponding ***Display manual.***

CONTROL HEAD

The control head engages both gear shifting and acceleration. Depending on single installation or multi installation of outboards, the boat is equipped with a single or twin shift control head. This description comprises a single shift control head only. Also refer to ***Single Control Head Manual*** or ***Twin Control Head Manual***.



1. *Engine trim control*
2. *Control lever*
3. *Lever position indicator*
4. *Control lamp*
5. *Neutral button*
6. *SEL button*
7. *Indicator lamp*

CONTROL HEAD OPERATION

WARNING

Be very cautious when first engaging the gears to establish that FORWARD is truly forward and REVERSE is truly reverse. A quick in-and-out of the gear test is recommended. Ensure that the boat is clear of all obstacles around the boat before conducting this test.

Control lamp

The control lamp ***(4)*** has a steady light indicating that the control head is active.

WARNING

A fast flashing light indicates a non-critical fault which may cause the boat speed to be reduced. The system will continue to operate.

Indicator dimming feature

When the control head is active, pressing the **SEL** button ***(6)*** repeatedly will cycle through the available indicator brightness levels.

Neutral indicator lamp

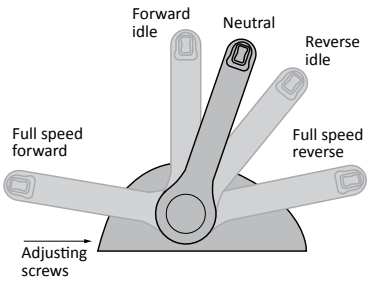
The neutral indicator lamp ***(7)*** has four states:

- Fast flashing in combination with lamp ***(4)*** indicates a critical fault which may result in limited or no system performance.

  DANGER

  Call for assistance, use another controlling device in an emergency.
- Steady light: engine is in neutral
- Slow flashing (0.5 s on, 0.5 s off): Neutral Throttle Warmup is engaged.
- Very slow flashing (1 s on, 1 s off): Trolling mode is engaged.

Control head range



Forward	idle to 100% of max engine rpm
Reverse	idle to 50% of max engine rpm
NTW	idle to 50% of max engine rpm
TM forward	idle to 20% of max engine speed
TM reverse	idle to 20% of max engine rpm
LSC forward	idle rpm
LSC reverse	idle rpm

Neutral Throttle Warmup

Neutral Throttle Warmup (NTW) allows to control the engine throttle without gear engagement, in order to warm up the engine at a higher rpm.

NOTE! Maximum rpm is limited to 2400 rpm.

A slow flashing neutral indicator lamp ***(7)*** shows that NTW is engaged.

Engaging NTW

Move the control lever ***(2)*** to the Neutral position. The neutral indicator lamp ***(7)*** will have a steady light.

Press the **N** button ***(5)***. The neutral indicator lamp ***(7)*** flashes to indicate that NTW is engaged.

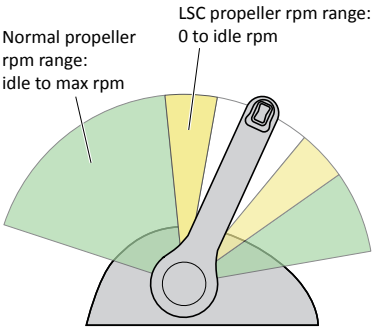
It is now possible to increase throttle and the engine will stay in neutral.

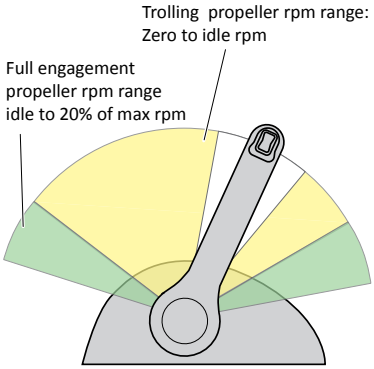
Disengaging Neutral Throttle Warmup

Return the lever ***(2)*** to the Neutral position.

Press the **N** button ***(5)***. The lamp ***(7)*** will have a steady light. The engine and transmission will now respond normally to lever commands.

Low Speed Control





Low Speed Control (LSC) enables unprecedented control while mooring and low speed maneuvering. LSC incorporates an electro-hydraulically operated clutch that ensures smooth shifting between neutral, forward and reverse.

The sensor controlled propeller speed allows for seamless control from zero to maximum rpm. The boat is fully operable even below 3-4 knots.

Trolling Mode

When engaging Trolling Mode (TM) the full throttle range represents 20% of normal throttle range. This enables a higher resolution of the throttle maneuvering thus giving the operator a more precise control in demanding situations.

A very slow flashing (one second on, one second off) neutral indicator lamp ***(7)*** indicates that TM is engaged.

Engaging Trolling Mode

Move the control lever ***(2)*** to forward idle or reverse idle positions.

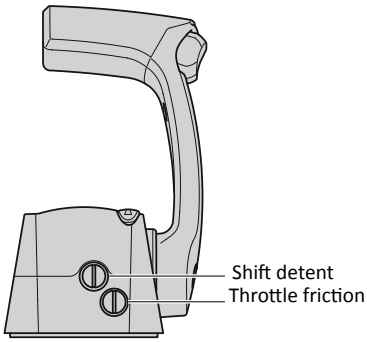
Press the **N** button ***(5)***. The lamp ***(7)*** will flash slowly to indicate that TM is engaged.

Disengaging Trolling Mode

Move the control lever ***(2)*** to forward idle or reverse idle position.

Press the **N** button ***(5)***. The flashing lamp ***(7)*** will go out to indicate that TM is disengaged.

Adjustable lever feel



The friction drag on the lever and the force required to move in and out of the shift detents can be set according to operator preference.

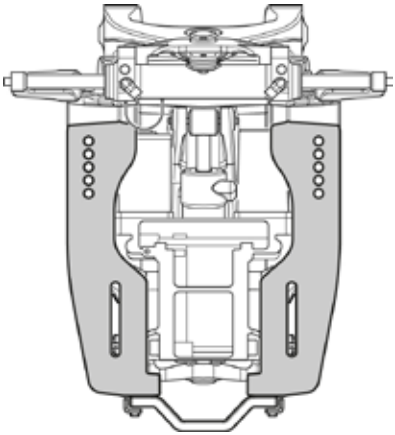
Turn the throttle friction screw clockwise to increase the friction on the lever, counter-clockwise to reduce the friction.

The shift detents are ment to prevent accidental gear engagement. Bear that in mind when you make adjustments. Turn the shift detent screw clockwise to increase, counter-clockwise to decrease force.

OUTBOARD INSTALLATION

The information presented in this section is intended as reference only. For more detailed information, refer to ***Installation Manual***.

Safe and proper mounting depends on experience and the specific boat and outboard combination. Therefore we strongly recommend that your local dealer install the outboard and related accessories to ensure proper installation and good performance.



Bolt pattern

WARNING

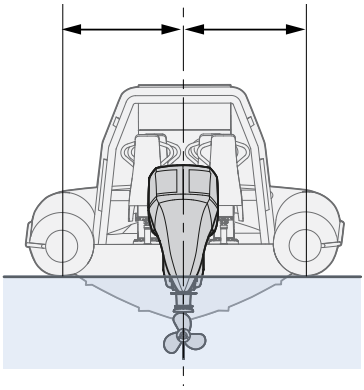
Exceeding the boat's maximum power rating can cause serious injury or death. Overpowering the boat can affect boat control and flotation characteristics or break the transom. Do not install an outboard that exceeds the boat's maximum power rating.

Improper mounting of the outboard can result in hazardous conditions such as poor handling or loss of control. Your dealer or other person experienced in proper rigging should mount the outboard.

Use mounting hardware to secure only the outboard to the boat. Do not use outboard mounting hardware to attach accessories.

MOUNTING THE OUTBOARD

The outboard should be mounted in such a way that the boat is well balanced. Otherwise it could be difficult to steer. Mount the outboard on the centerline (keel line) of the boat.

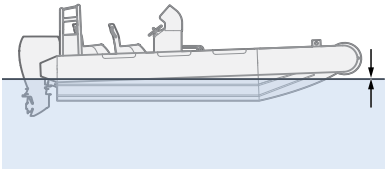


Mounting height

The mounting height of the outboard affects its efficiency and reliability. A mounting that is too high might lead to propeller ventilation, which will reduce propulsion due to excessive propeller slip. There is also a risk of overheating the outboard due to the water intakes of the cooling system may not get enough water supply.

If the outboard mounting is too low, the water resistance will increase and thereby reduce the efficiency and performance of the outboard. In general, the outboard should be mounted so that the anti-cavitation plate is in alignment with the bottom of the boat.

The optimum mounting height is determined by the boat/outboard combination in addition to the required use. Test runs at different heights can be of assistance when choosing the optimum mounting height. For further information, please contact the manufacturer.



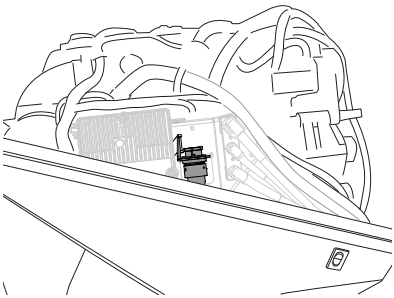
CAUTION

Check the carrying capacity of the boat, at rest and with maximum load, during water testing.

Check that the static water level on the outboard rig is low enough to prevent water from entering the powerhead when water rising due to waves when the outboard is not running.

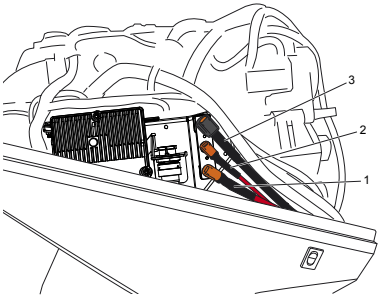
Incorrect engine height can create air born water spray while the boat is cruising. If the outboard is operated continuously in the presence of airborne water spray, enough water could enter the engine through the intake opening on the cowling and cause severe engine damage.
Eliminate the cause of airborne water spray.

Engine connector



Connect the helm harness to the engine harness. Refer to ***Installation Manual***.

Connecting the battery



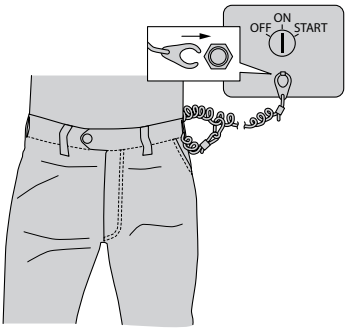
CAUTION

Make sure the main switch is OFF before working on the battery connections.

1. Connect the largest cable, black, (black connector) ***(1)*** to the upper end pin connector. Make sure it "clicks"!
2. Connect the smaller red cable (red connector) ***(2)*** to the center pin connector. Make sure it "clicks"!
3. Connect the larger red cable (red connector) ***(3)*** to the lower end pin connector. Make sure it "clicks"!

Also read the ***Installation Manual***, section ***Power cable Installation Process*** to learn more details about connecting power to the outboard.

Engine kill-cord



One clip must be attached to the engine shut-off switch, the other to a secure place on the operator's floating device or wrist. If the operator falls overboard or moves far enough away from the operator's position the -kill cord will stop the engine, thereby prevent the boat from running away under power.

BREAKING IN THE ENGINE

The OXE Diesel outboard, as well as all new engines, needs a period of breaking in. This is to allow mating surfaces of moving parts to wear in evenly. Correct break-in will help to ensure proper performance and a prolonged engine life. Most diesel engines notice an increase in performance and reduction in fuel consumption after 150 hours of breaking in time.

CAUTION

Failure in following the break-in procedure can result in severe engine damage or reduced engine life.

NOTE! Run the outboard in water and in gear with a propeller installed as follows.

Break in procedure

The OXE Diesel outboard needs break-in time before being operating to its full potential. This is due to the design characteristics of the unit.

Follow the recommendations below:

0-5hrs: Use varied load and rpm but do not load the engine above 50% throttle and keep maximum rpm below 2500. Do not stay at one load and rpm configuration for more than 30 minutes at a time.

The gear should be shifted a minimum of ten (10) times during the first five (5) hours

5-10hrs: Use varied load and rpm but do not load the engine above 60% throttle and keep maximum rpm below 2850. Do not stay at one load and rpm configuration for more than 30 minutes at a time.

The gear should be shifted a minimum of ten (10) times during the additional five (5) hours.

10-30hrs: Use varied load and rpm but do not load the engine above 80% throttle and keep maximum rpm below 3000. Do not stay at one load and rpm configuration for more than 30 minutes at a time.

The gear should be shifted a minimum of twenty (20) times during the additional twenty (20) hours

30-50hrs: Use varied load and rpm, the engine can be used up to 100% throttle and full rpm. Do not stay at one load and rpm configuration for more than 30 minutes at a time.

The gear should be shifted a minimum of twenty (20) times during the additional twenty (20) hours

Do an oil and filter change according to ***Maintenance schedule, 1st inspection, after 50 h***.

Use oil and filter as specified in the Engine Technical Manual.

NOTE! When the initial oil change is done, small metal particles may be found in the break-in oil. Do not be alarmed. This is typical during break-in and will decrease as you run the outboard.

OPERATING

BEFORE START-UP

WARNING

Risk of accidents! Items in the pre-operation checks not working properly, should always be inspected and repaired before operating the outboard.

Checking the fuel level

- Check the fuel level. Fill up if necessary.
- Ensure that there are no fuel leaks or fumes.
- Check the fuel line connections to ensure they are tight.
- Check the water in the fuel filter. Drain off the water if necessary.

Filling fuel

1. Remove the fuel tank cap.
2. Carefully fill the fuel tank with diesel.
3. Securely close the cap after filling the tank. Wipe up any spilled fuel.

NOTE! If necessary, refer to ***Evacuating air from fuel system.***

Controls

- Check the throttle, shift, and steering for proper operation before starting the engine.
- The controls should work smoothly, without binding or unusual free play.
- Look for loose or damaged connections.
- Check that the main cable and the connector are in good condition.
- Check that the gear is in neutral.

Outboard

- Check the outboard and the outboard mounting.
- Check for loose or damaged fasteners.
- Check the propeller blades for damage.
- Check that the battery cables and connections are in good condition.
- Check fitting of the top cowling.

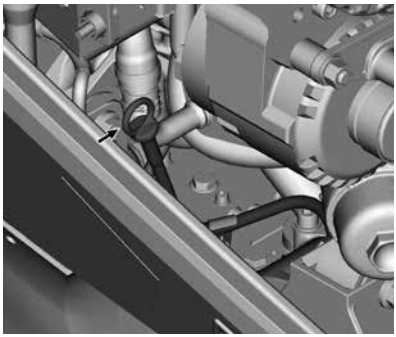
NOTE! Check the water surrounding the boat for leakage of engine or hydraulic oil!!

Check engine oil, hydraulic oil and belt oils

CAUTION

Ensure that the outboard is in vertical position when checking engine oil level, gear oil level and upper and lower belt oil level.

Check engine oil

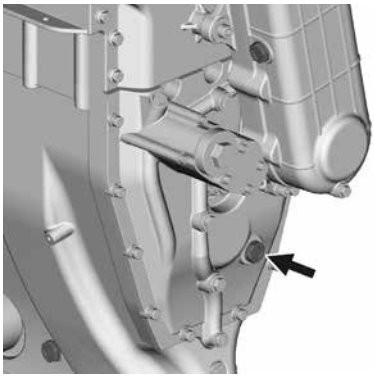


1. Remove the engine oil dipstick and wipe it clean.
2. Completely insert the dipstick and remove it again.

NOTE! Be sure to completely insert the dipstick into the dipstick guide.

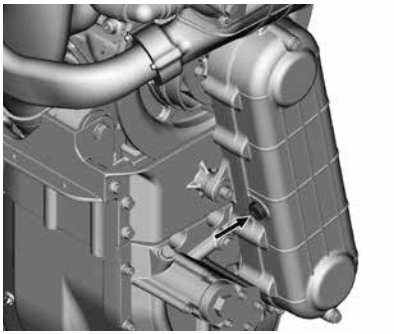
3. Check that the engine oil level is between the upper and the lower mark on the dipstick. If below the lower mark, fill up with engine oil.
4. Wait a few minutes until the oil has run down. If oil level is above dipstick upper mark drain appropriate amount of oil. Excess oil level can cause reduced performance and oil leakage.
5. Check for oil leaks.

Check hydraulic oil



1. Visually check oil quality. If the oil looks milky and foamy, water has entered the housing. Check for leakage and replace the oil.
2. Check that the oil is in level with the sightglass.
3. Fill up if necessary.

Check upper belt oil quality

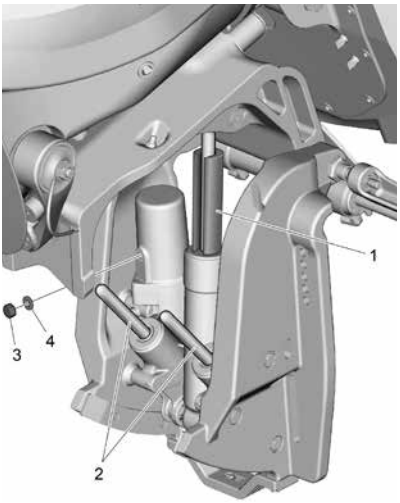


1. Visually check oil quality.
   If the oil looks milky and foamy, water has entered the housing.
   Please contact your local OXE-dealer or OXE-servicecenter immediately.

Check lower belt oil quality

1. Visually check oil quality.
   If the oil looks milky and foamy, water has entered the lower housing.
   Please contact your local OXE-dealer or OXE-servicecenter immediately.

Check fluid level in power trim and tilt unit



1. Tilt up the outboard completely and support the tilt cylinder with a transom saver ***(1)***.

WARNING

Make sure to support the outboard with the transom tilt saver. Otherwise the outboard can fall down accidentally if the power tilt and trim unit looses pressure.

WARNING

Ensure that the trim and tilt rods *(2)* are fully extended when the plug is removed. Otherwise the fluid can spray from the reservoir due to internal pressure.

2. Remove the filling plug ***(3)*** and seal ***(4)***. Check the fluid level in the reservoir.

NOTE! If the fluid is correctly levelled, only a small amount of fluid should come out of the filling hole when the plug is removed.

3. If necessary, fill up with fluid of recommended type until it comes out of the filling hole.

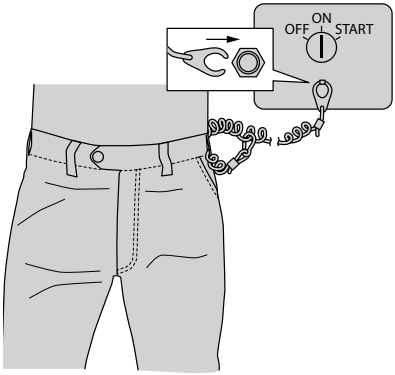
STARTING THE OUTBOARD

WARNING

Before starting the engine, make sure that the boat is tightly moored and that you can steer clear of any obstructions. Be sure that there are no obstacles in the water near the boat.

Prestart checks

- Check that the engine ignition switch stops the engine.
- Confirm that removing the clip from the engine shut-off switch stops the engine.
- Confirm that the engine cannot be started with the clip removed from the engine ignition switch.



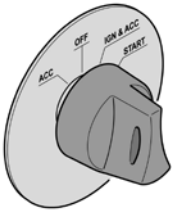
1. Attach the engine kill-cord to your clothes/floating device or your wrist. Then install the other clip on the engine ignition switch.

WARNING

Attach the engine kill-cord in a secure way to your clothes/ floating device or wrist while operating the boat.

Prevent the kill-cord from entangling with nearby objects and do not attach the cord to clothing that could tear loose.

Avoid accidental or unintended activation of the ignition switch. Unexpected loss of forward motion can cause people and obstacles beeing thrown forward. Loss of power also leads to poor directional control.



2. Turn the ignition key to **IGN&ACC**.
3. Turn the key to **START** and hold it there for a maximum of 5 seconds. In cold weather, below +10 Celsius degrees, let the ignition be on for 5 seconds before turning to start.
4. Immediately after the engine starts, release the key in order to return to the **IGN&ACC** position.

CAUTION

Never turn the ignition key to start while the engine is running.

Do not let the starter turn for more than 5 seconds. If the starter is turned continuously for more than 5 seconds, the battery may be discharged and the engine will not start again. There is also a risk of damaging the starter.
If the engine does not start after 5 seconds of cranking, return the key to ON and wait for 10 seconds before cranking the engine again.

Ensure there is a new battery fitted before starting. If the engine does not start, ensure there is enough voltage in the battery. Voltage should not drop below 10V when cranking.

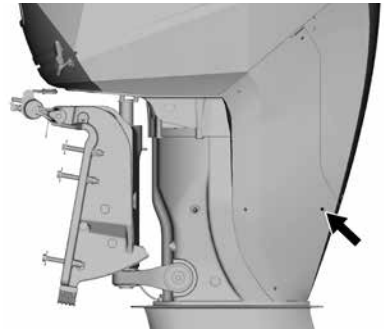
Warming up the engine

1. Allow the engine to idle for 3 minutes to warm up, otherwise there is a risk of shortening the engines life.
2. Ensure that no oil-pressure warning is lit on the engine display after the engine has started.
3. Check for a steady flow of water from the tell-tale. If not, ***see step 4-6***, next page.

WARNING

Stop the engine immediately if an oil-pressure warning is lit on the engine display and the buzzer sounds. Risk for severe engine damage! Check the oil level and fill up if necessary. If no cause for the low oil pressure warning can be found, contact your dealer or the manufacturer.

When the engine is running, a continuous flow of water from the tell-tale shows that the sea-water pump is pumping water through the cooling passages. Stop the engine immediately if no water is flowing from the tell-tale. Risk for overheating or serious damage to the engine!



Tell-tale

NOTE! It takes approx 10 sec after start for the water to flow from the tell-tale.

4. Check if the sea-water inlet or outlet is blocked. Clean if necessary.
5. Restart the engine.
   If the fault still remains may indicate a water pump failure or a blockage in the cooling system.
6. Check the sea water pump impeller and change if broken or worn. This may cause the engine to overheat.

NOTE! If the impeller in the water pump is damaged due to running without water, the impeller has to be replaced.

WARNING

If the failure remains, have the outboard checked by an authorized technician. Operating the engine while overheated will cause engine damage.

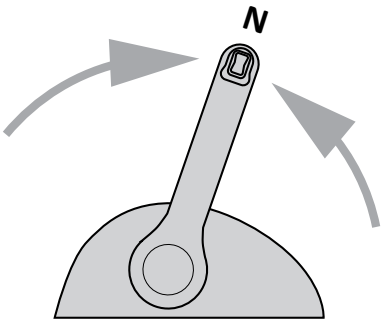
Shifting

WARNING

Before shifting, make sure that there are no obstacles near the boat.

CAUTION

Warm up the engine before shifting gear.



4. Place control lever in **N** (neutral) in order to activate shifting and traction. Refer to corresponding ***Control Head Manual***.

Stopping the engine

Let the engine cool off for a few minutes at idle or low speed before stopping the engine. Stopping the engine immediately after operating at high speed is not recommended.

1. Turn the key to **OFF**.
2. Remove the key if leaving the boat unattended.

NOTE! The engine can also be stopped by pulling the cord and removing the clip from the engine shut-off switch, then turning the ignition key to off-position.

POWER TRIM OPERATION

The OXE Diesel outboard is equipped with a hydraulic trim system, with which you can change the angle of the drive in relation to the transom. The trim angle of the outboard is part of the determination of the boat's bow position. A correct trim angle improves fuel economy and reduce engine strain. The trim angle depends on a combination of boat, engine, and propeller.
The trim angle is also affected by other variables such as the load in the boat, sea conditions, and running speed.

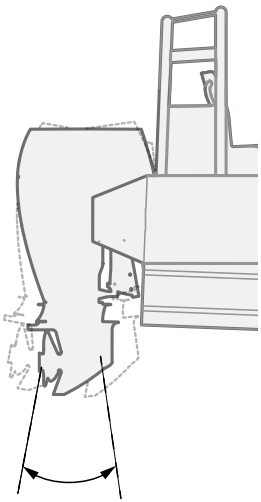
With most boats, operating around the middle of the trim range will give satisfactory results. In order to take full advantage of the trimming capability there maybe times when you choose to trim the outboard all the way in (down) or out (up).

DANGER

Avoid over-trimming (trim-up or trim-down) the drive system as this can affect the steering of the boat severely.

Each boat has its own unique characteristics and will be affected in different ways by the factors involved, only general advice is given here on how to get the best trimming angle for your boat.

Get to know the power trim, make test runs at slower speeds and at various trim positions to see the effect of trimming. Note the time it takes for the boat to plane, watch the speed readings and the ride action of the boat.



Trim operating angle

CAUTION

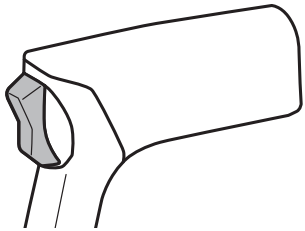
If the boat begins to feel unstable or is harder to steer, slow down and /or readjust the trim angle.

Adjusting the trim angle

WARNING

Make sure that the boat's occupants are clear of the outboard when adjusting the trim angle. Body parts can be crushed between the outboard and the clamp bracket when the motor is trimmed or tilted.

Adjust the outboard trim angle using the power trim and tilt switch.

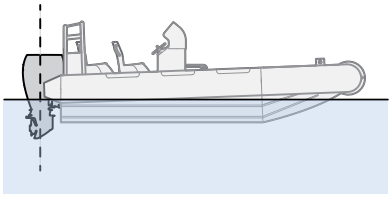


Power trim and tilt switch on single lever

- To raise the bow (trim-out), press the switch **UP** (up).
- To lower the bow (trim-in, press the switch **DN** (down).

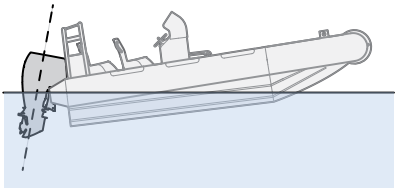
Make test runs with the trim set in different angles. When the boat feels well-balanced, easy to steer and pleasant to operate, then the optimal trim angle for the boat is achieved.

Adjusting the boat trim



A bow-up attitude results in less drag, greater stability and efficiency when the boat is on plane. With the bow up, the boat can have a tendency to steer to one side or the other, requiring compensational steering adjustments. To help offset this effect, the trim tab can be adjusted. It is easier to accelerate from a standing start onto plane when the bow of the boat is down.

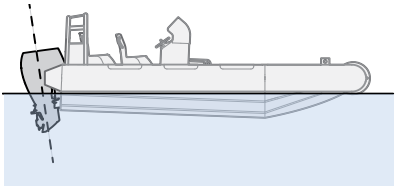
Bow up



Too much trim-out or up can:

- Lift the bow higher out of the water.
- Generally increase top speed.
- Increase clearance over submerged objects or a shallow bottom.
- In excess, can cause boat porpoising (bouncing) or propeller ventilation.
- Cause engine overheating if any cooling water intake are above the waterline.

Bow down



Too much trim-in or down can:

- Lower the bow.
- Result in quicker planing off, especially with a heavy load or a stern heavy boat.
- In excess, can lower the bow of some boats to a point where they begin to plow with their bow in the water while on plane. This can result in an unexpected turn in either direction (called bow steering or oversteering) if any turn is attempted, or if a significant wave is encountered.

NOTE! Depending on type of boat, the outboard trim angle might have little effect on the trim of the boat during operation.

POWER TILT OPERATION

If the outboard is shut off for a longer period or if the boat is moored in shallow water, the outboard should be tilted up. This is to protect the propeller and lower housing from damage by collision with obstructions, and also to reduce salt corrosion.

WARNING

Make sure that the boat's occupants are clear of the outboard when adjusting the tilt angle. Body parts can be crushed between the outboard and the clamp bracket when the outboard is trimmed or tilted.

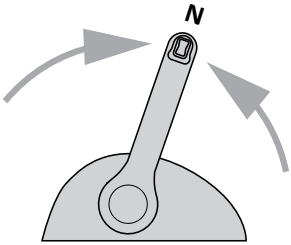
CAUTION

Never tilt the outboard while the engine is running. This could result in severe engine and PTT-unit damage.

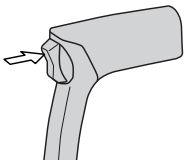
CAUTION

Make sure all the water intake holes stay submerged at all times. Risk for severe damage from overheating!

Procedure for tilting up

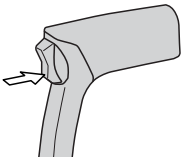


1. Place the control head lever in neutral position.



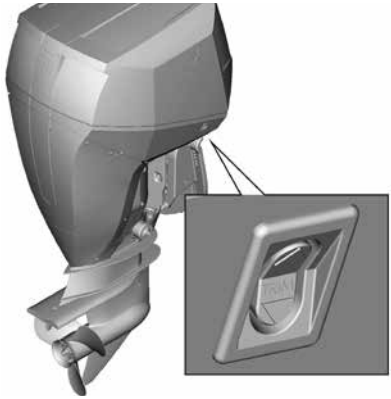
2. Press the power trim and tilt switch **UP** until the outboard has tilted up completely.

Procedure for tilting down



1. With the control head lever in neutral position, press the power trim and tilt switch **DN** to lower the outboard to the desired position.

Power trim and tilt switch on engine cowling



Trim and tilt switch on cowling

The power trim and tilt switch is located on the starboard side of the bottom engine cowling. Pressing the switch up trims the outboard up to a certain position and then tilts it up. Pressing the switch down trims the outboard down and tilts it down to a certain position. When the switch is released the outboard will stop and stay in its current position.

WARNING

Only use the power trim and tilt switch located on the engine cowling when the boat is at complete stop with the engine shut off.

Attempting to use the switch while the boat is moving increase the risk of falling overboard, distracting operator or collision with other boats or obstacles.

MAINTENANCE

OUTBOARD CARE

It is important that your outboard receive the periodic inspections and maintenance listed in the ***Maintenance Schedule***, in order to keep the outboard in best condition.

NOTE! If periodic inspections and maintenance are not followed as described, the manufacturer's warranty coverage will not apply.

OWNERS RESPONSIBILITY

The owner is required to have routine engine maintenance performed to maintain emission levels within prescribed standards.

The owner is not to modify the engine in any manner that would alter the power output or allow emissions levels to exceed their predetermined factory specifications.

TRANSPORTING THE OUTBOARD

DANGER

Never get under the lowered outboard while it's tilted, even if a support bar is used. Severe injury could occur if the outboard accidently falls down.

When transporting the the boat on a trailer, the outboard should be positioned in normal running position. If the road clearance is insufficient in this position, the outboard may be transported in tilt position using a support device such as a transom saver bar. Consult your dealer for further details.

Additional clearance may be required for railroad crossings, driveways and trailer bouncing. Refer to your local dealer for recommendations.

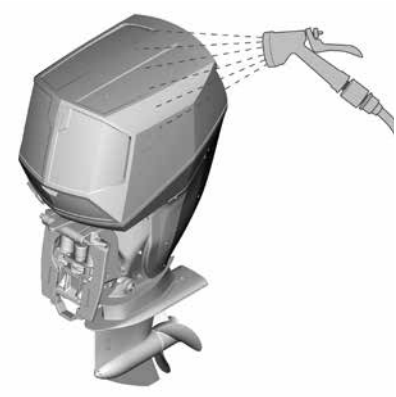
CAUTION

Do not rely on the power trim/tilt system to maintain proper ground clearance for transportation with a trailer. The power trim/tilt system is not intended to support the outboard under these conditions.

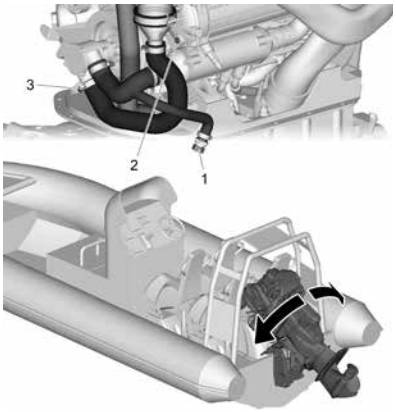
CLEANING THE OUTBOARD

After operating in demanding conditions, flush the cooling seawater passages with fresh water to prevent them from becoming corroded or blocked by buil-up of salt. ***Refere to Flushing the power unit.***

We also strongly recommend to increase cleaning intervals of seawater strainer and water intake when operating in muddy or turbid water.



1. Flush the outside of the outboard with fresh water and, if possible, flush the power head under the cowling.
2. Drain the cooling seawater completely out of the engine.



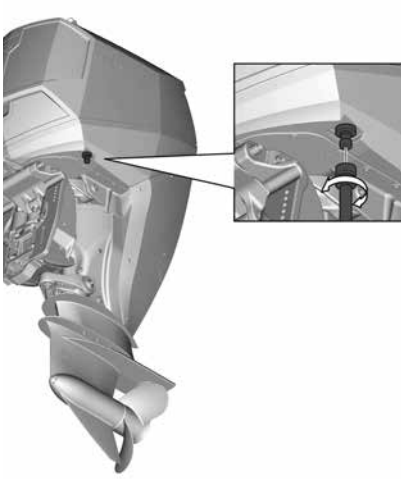
3. Open connection ***(1)*** and place a container beneath.
4. Unscrew the plug on the side of the heat exchanger ***(2)***.
5. Undo the hose on the seawater pump ***(3)*** and drain the seawater.
6. Tilt the outboard to a 45^0 angle to drain as much as possible of the seawater out of the system.
7. When in this position, steer the outboard fully to starboard and port. Repeat if necessary.

Flushing the power unit

Perform this procedure right after operation to achieve the best result.

WARNING

Do not perform this procedure while the engine is running. The water pump may be damaged and severe damage from overheating can result.



Bottom cowling water fitting

1. After shutting down the engine, unscrew the cap from the fitting on the bottom cowling.
2. Screw a garden hose adapter onto a garden hose, which is connected to a fresh water supply. Then connect it to the fitting on the bottom cowling.
3. With the engine off, turn on the water flush through the cooling passages for about 15 minutes. Turn off the water and disconnect the garden hose adapter from the garden hose connector.
4. Remove the adapter from the fitting on the bottom cowling. Replace the cap and tighten securely.

WARNING

Do not leave the garden hose connector on the bottom cowling fitting or let the hose hang free during normal operation. Water will leak out of the connector instead of cooling the engine, which can cause serious overheating. Replace the cap after flushing the engine.

NOTE! When flushing the engine with the boat in the water, tilting the outboard until it is completely out of the water will achieve better results.

STORING THE OUTBOARD

When storing your OXE Diesel outboard for a longer period of time (2 months or more), some important procedures must be performed in order to prevent excessive damage.

NOTE! We strongly recommend to have the outboard serviced and winterized by your authorised dealer before storing.

CAUTION

To prevent oil from the sump entering a cylinder, keep the outboard in upright position when transporting and during storage. Do not store or transport the outboard on its side.

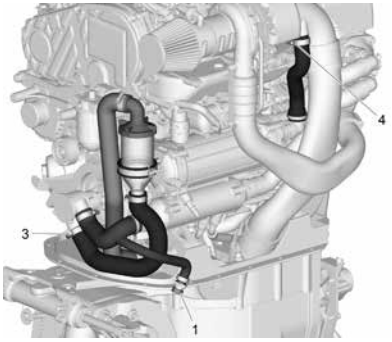
To prevent freezing damage, the seawater system must be drained and the freshwater system coolant must have sufficient antifreeze protection, see *Check coolant level and mixture*. Also refer to *Workshop Manual*.

To prevent any damage such as corrosion build-up, which could lead to permanent engine failure. It is required to apply fogging oil (engine conservation oil) in the tail-pipe of the turbo charger to prevent the vanes inside the turbo charger from sticking.

Store the outboard in a dry, well ventilated place. Protect from sunlight.

Winterization of the outboard

When storing an engine for a prolonged period of time or in sub-zero temperatures several important procedures should be performed to prevent engine issues.



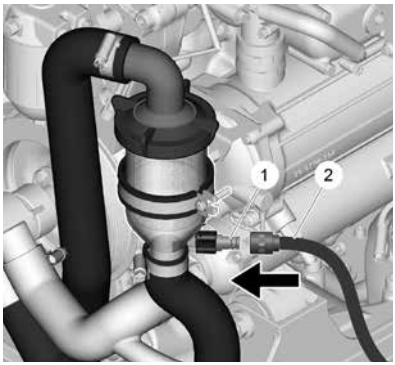
1. Open connection ***(1)*** and place a container beneath.
2. Open the lower connection for the seawater on the belt housing and place a container beneath.
3. Remove all necessary engine components to get satisfactory access for applying fogging oil on the vanes inside the turbocharger by spraying through the turbine wings in a circular motion. After successfully applying the fogging oil on the vanes, in reverse order, assemble the engine components to the engine.

4. Open connection ***(4)*** and fill with coolant fluid of sufficient grade temperature-wise until it exits from connection ***(1)***.
5. Undo the hose on the seawater pump ***(3)*** and drain the seawater.

An alternative solution is to run the outboard with the water-intake point in the front of the lower housing lowered into a coolant fluid mixture of sufficient grade.

Run the outboard until the entire sea-water part of the system is filled with coolant fluid and thus protected from freezing and corrosion.

Another alternative is to connect a rubber hose ***(2)*** to the seawater strainer connector ***(1)***. Insert the other end of the hose into a container filled with cooling fluid mixture. Run the outboard until the entire sea-water part of the system is filled with coolant fluid and thus protected from freezing and corrosion.



CHECKING AND OTHER MAINTENANCE

Check air intake system

It is of great importance that the intake system is intact. Broken and leaking pipes can drastically shorten the life of the engine.

Check the system regularly.

- Check hoses for fissures and damage. Replace, if necessary.
- Ensure that all hose clips and clamps are tightened and fit easily.
- Check the air filter
- Check the filter insert for holes or cracks.
- Check for dampness.
- If damaged or otherwise blocked, replace the air filter.

Check air filter

- Check, replace if necessary, tubes and hoses if leaking.
- Check joints and clamps.
- Check exhaust manifold.
- Start the outboard and check for exhaust leaks.

Check engine for oil leakage

- Check seals and gaskets.
- Check engine oil filter

Check drive belts

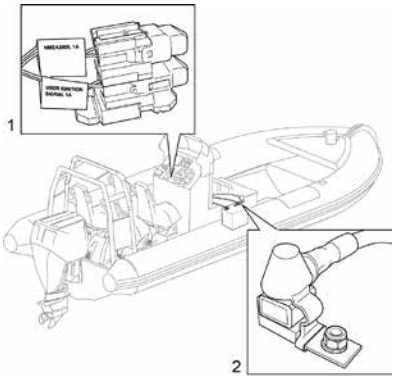
- Check alternator drive belt for wear or damage.
- Check function of alternator drive belt tensioner.

Check battery

- Remove corrosion from the battery connections and check that the cable connections are tightened.
- Lubricate the battery terminals with grease.

Check electric system

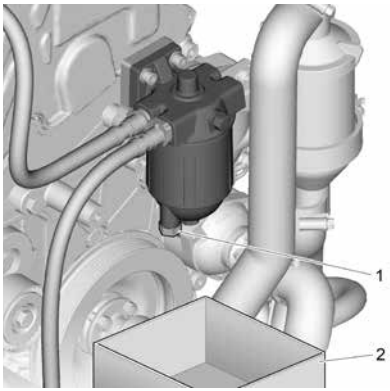
- Check connections on the outboard.
- Remove corrosion from access points, contacts and fuses. Lubricate with grease.
- Check fuses. Ensure spare fuses aboard.



1. a) ***NMEA2000***, ATO 1A fuse, used only in ***single engine application***. In multi-engine applications fused external supply must be used to the NMEA2000 bus (3A).
   b) ***User ignition signal***, ATO 1A, used only for ignition control of peripheral equipment externally powered.
2. Use a 100 A fuse on the power supply, control (thinner red cable).

NOTE! No fuse on the common power supply.

Check fuel system



Fuel filter and water separator

WARNING

Discard oil and fluids according to local environmental legislation.

- Check the fuel filter water separator. Drain if necessary, ***refer to Drain the fuel filter***.
- Bleed the fuel system and check hoses and connectors for leakage.

WARNING

Turn off the engine immediately in case of leakage.

Evacuating air from fuel system

NOTE! In order for the diesel fuel system to work properly, the fuel lines must be full of fuel and contain no air. If air gets into the fuel lines, it will be necessary to evacuate the air from the system to eliminate the air before operating the outboard.

Air could have entered the system in any of the following ways:

- The engine ran out of fuel.
- The fuel lines have damaged/ leaking joints.
- The filter was removed for service or replacement.
- The fuel lines were removed or disconnected for servicing.
- The fuel pump was removed for servicing.
- The fuel pre-filter water drain cock was opened while the engine was running.

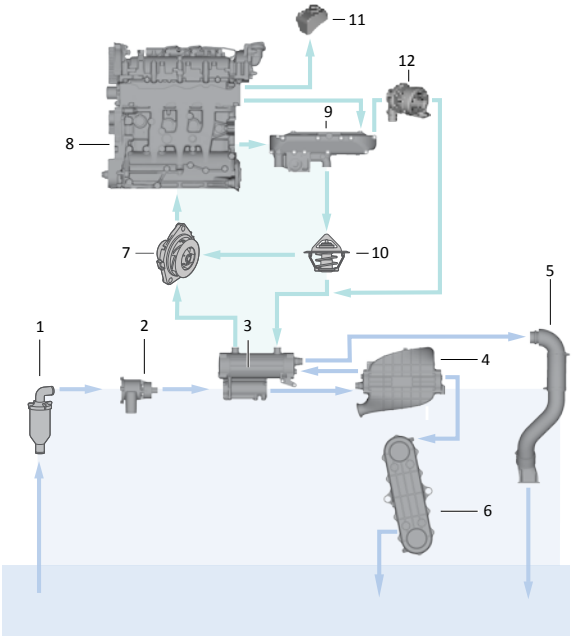
If one or more of the above occurred, air has entered the fuel system and you will need to evacuate the air from the system prior to operating the outboard.

1. Turn the ignition key **ON**. The fuel pump will run for 20 seconds.

NOTE! Do not turn the ignition key to **START**. This could damage the injection pump.

2. Repeat three times until untill the pump is filled with fuel and no more air is left.

Check cooling system

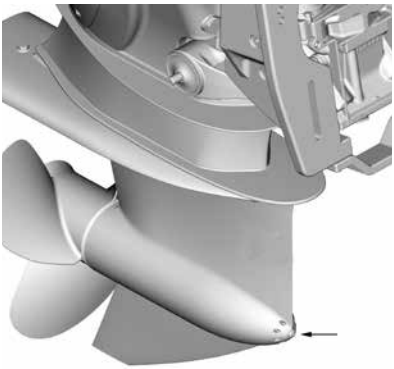


1. *Seawater strainer*
2. *Seawater pump*
3. *Heat exchanger and hydraulic oil cooler*
4. *Intercooler*
5. *Exhaust pipe*
6. *Belt housing cooler*
7. *Engine water pump*
8. *Engine*
9. *Exhaust manifold*
10. *Thermostat*
11. *Expansion tank*
12. *Turbocharger*

Check the system regularly.

- Check hoses for fissures and damage. Replace, if necessary.
- Check that the water intake is not blocked. Clean, if necessary.
- Check the seawater filter. Clean if necessary.
- Check coolant level and mixture. Fill up, if necessary.
- Check that the telltale is not blocked. Clean daily with a pipe cleaner or similar.
- Check hydraulic oil cooler water outlet for clogging. Clean with pipe cleaner or similar.

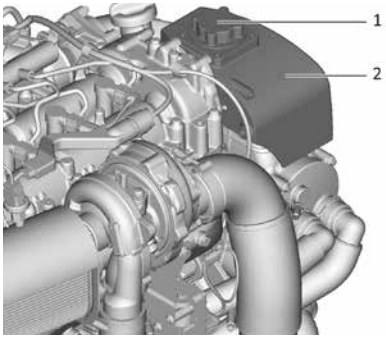
Check water intake



Water intake

Make sure that the sea water intakes are not clogged by seaweed or obstacles. Clean if necessary.

Check coolant level and mixture



Expansion tank

1. Check the cooling level, 4 cm below the filler neck edge. ***(2)***.

The cooling system of the engine is to be filled with a mixture of distilled water and antifreeze based on ethylene glycol and/or anticorrosion additive, see ***Recommended fluids and grease***.

Coolant must be added at the ***filler cap (1) only***.

Do not add cold coolant to a warm engine.

NOTE! Ensure that the mixing ratio "water-antifreeze" is preserved.

Check power trim and tilt system

WARNING

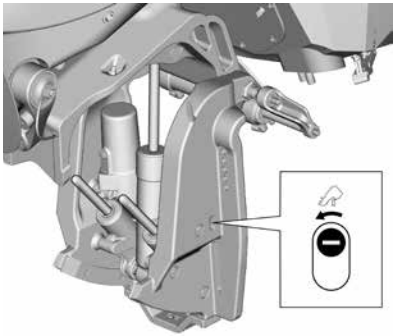
Never get under the lower unit while it is tilted. Risk for severe injury if the outboard accidentaly falls!

Make sure no person is under the outboard before performing this test. Risk of crushing injuries between outboard and clamp bracket if the outboard is trimmed or tilted.

1. Check the power trim and tilt unit for any signs of oil leaks.
2. Operate each of the power trim and tilt switches on the remote control and lower cowling to check that all switches work.

NOTE! The ignition key must be in **IGN&ACC** position.

3. Tilt up the outboard and check that the tilt rod and trim rods are extended completely.



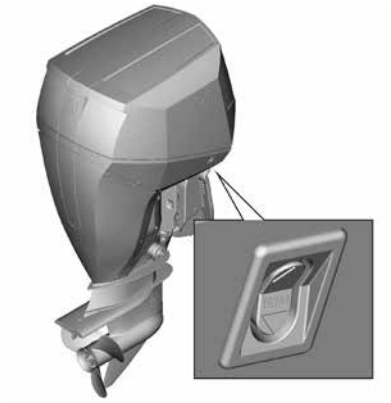
Tilt and trim rods, manual valve

4. Check that the tilt rod and trim rods are free from corrosion or other flaws.
5. Activate the tilt-down switch until the rods have retracted completely into the cylinders.

CAUTION!

The outboard can belowered by carefully turning manual valve, should the electric system fail.

Ensure that the manual valve is tightened before starting the outboard.



Tilt and trim switch on cowling

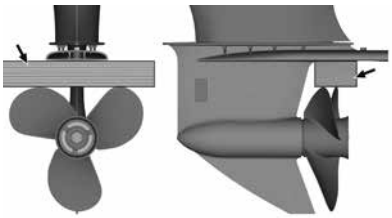
6. Activate the trim-up switch until the tilt rod is fully extended.
7. Tilt the outboard down. Check that the tilt rod and trim rods operate smoothly.

NOTE! Consult your dealer if any operation is abnormal.

Check propeller

WARNING

You could be seriously injured if the engine accidentally starts when you are near the propeller. Before inspecting, removing, or installing the propeller, place the shift control in neutral, turn the key to OFF and remove the key. Remove the clip from the engine shut-off switch. Disconnect the battery main switch.



Loosen or tighten the propeller nut

Do not use your hand to hold the propeller when loosening or tightening the propeller nut. Put a wooden block between the anti-cavitation plate and the propeller to prevent the propeller from turning.

Propeller checkpoints

- Check each of the propeller blades for erosion or other damage.
- Check the propeller shaft for damage.
- Check the splines for wear or damage.
- Check for obstacles tangled around the propeller shaft.

Propeller shaft oil seals

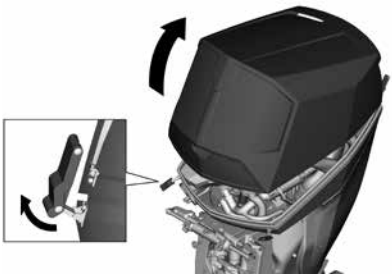
- Check the propeller shaft oil seals for leakage. Replace if necessary.

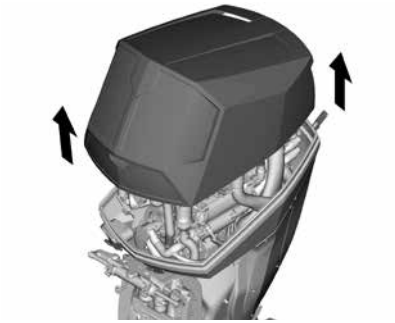
Check the top cowling

CAUTION

Make sure that the top cowling is securely closed and that there are no gaps. A loose or improperly fitted cover could allow water to enter the engine.

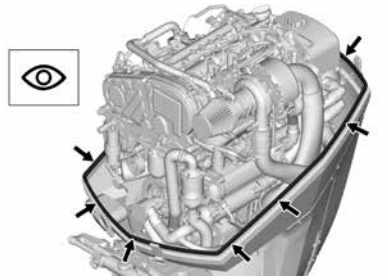
Check the fitting of the top cowling. Reinstall if the fit is not complete. Contact your dealer/manufacturer if it is still loose.





Check cowling sealing

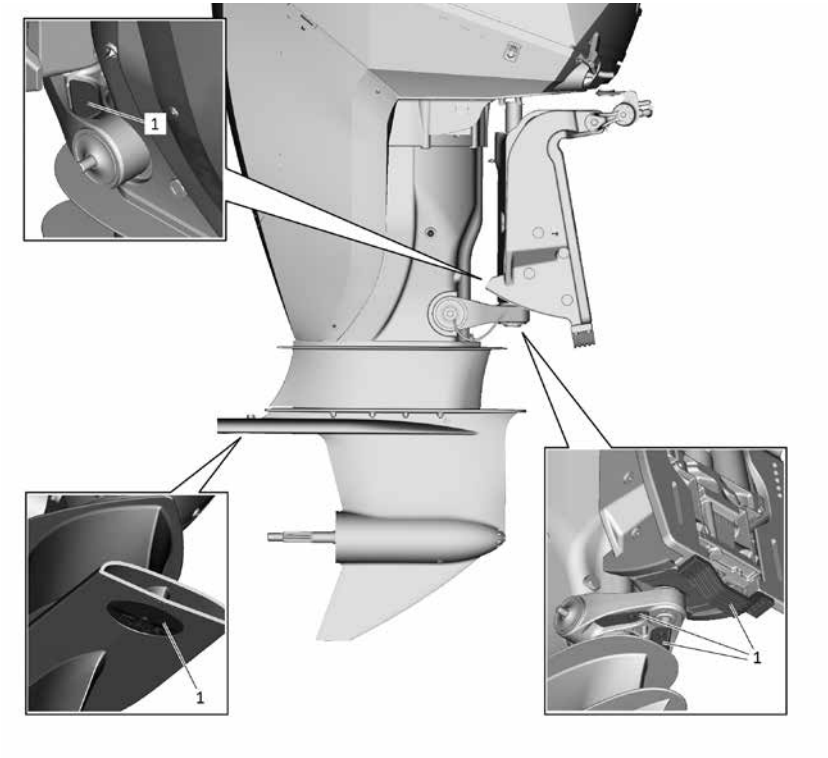
Check that the sealing is not dry, broken or worn, as this will allow water to enter the engine.



Check painted surfaces

Check the outboard for scratches, nicks, or flaking paint. Areas with damaged paint surfaces are more likely to corrode. Clean and paint the areas if necessary.

Inspect anodes

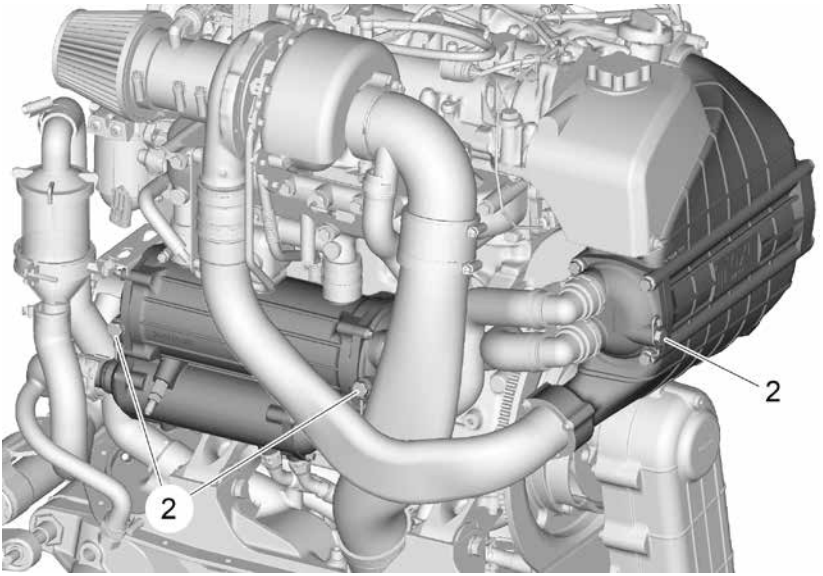


Anodes on the rig

The OXE Diesel outboard is protected from corrosion by sacrificial anodes. Inspect the external anodes ***(1)*** periodically and remove scale from the surface. Replace at service intervals or when anodes are reduced to 2/3 their original size.

CAUTION

Do not paint anodes as it would make them ineffective.



Anodes under the cowling

The heat exchanger and the intercooler are located under the cowling. Both units are equipped with sacrificial anodes to protect from corrosion.

Inspect the anodes ***(2)*** periodically and remove scale from the surface.

Replace at service intervals or when anodes are reduced to 2/3 of their original size.

CAUTION

Ensure that anodes and threads are clean before mounting.

CHANGE FLUIDS AND FILTERS

Prevention of environmental damage

Engine or hydraulic oil and filter elements / cartridges, fuel / fuel filter

Dispose of used oil according to local environmental legislation.

Take strict precautions to ensure that no oil or Diesel fuel contaminate soil or drainages.

CAUTION

Risk of contamination of drinking water.

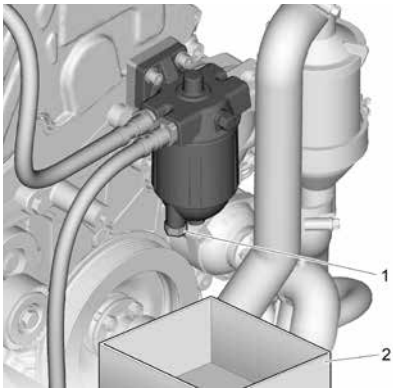
Filter elements are classed as dangerous waste and must be treated as such.

Coolant

Treat undiluted corrosion protection agents and / or antifreeze as hazardous waste.

When disposing of used coolant, the environmental legislation issued by the relevant local authorities must be adhered to.

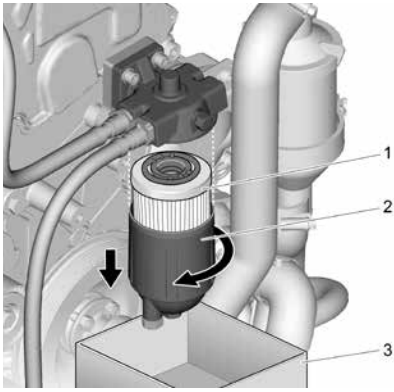
Drain the fuel filter



1. Apply a suitable container ***(2)*** in order to collect the fuel-water mixture that drains from the fuel filter.
2. Loosen the draining screw ***(1)*** and release the fuel-water mixture into the container. Tighten the draining screw ***(1)***.

NOTE! Also drain the fuel prefilter in boat!

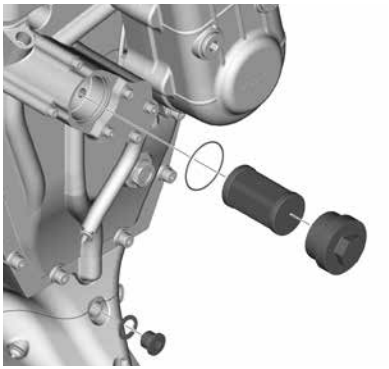
Replace fuel filter element



1. Apply a suitable container ***(3)*** in order to collect the fuel-water mixture that drains from the fuel filter.
2. Unscrew the fuel filter bowl ***(2)***.
3. Remove the filter element ***(1)***.
4. Insert a ***new*** filter element ***(1)*** and reinstall the fuel filter bowl. Tighten by hand.

NOTE! Also replace fuel prefilter element in boat!

Replace hydraulic oil and filter

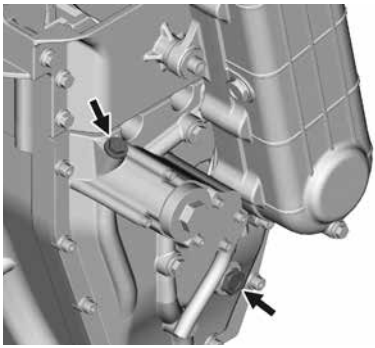


WARNING

The hydraulic oil filter is pressurised. Before removing it the pressure must be released.

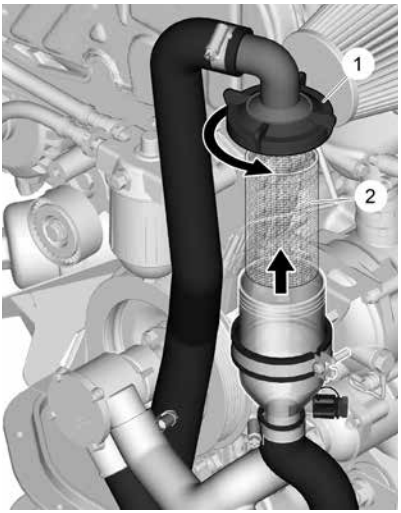
1. Turn the ignition ON and shift gear a couple of times from forward to backward.
2. Tilt the outboard in order to minimize any oil spill. Remove the oil plug and washer. Drain the oil into a suitable container.
3. Carefully clean the area around the hydraulic oil filter with pressurised air.
4. Remove the filter cap. Have a cloth nearby to collect the oil in the filter.
5. Install a ***new*** filter and reinstall the filter cap. Tightening torque ***70 Nm (51.2 ft-lb)***.
6. Clean and reinstall the oil plug. Install a ***new*** gasket. Tightening torque ***30 Nm (6.6 ft-lb)***.

Refill hydraulic oil



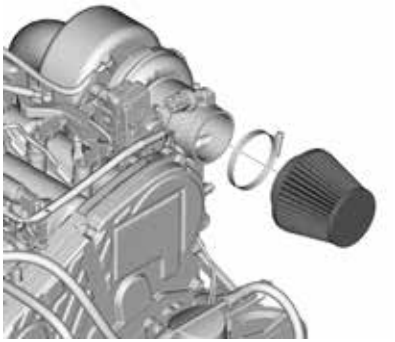
1. Unscrew the oil filling plug.
2. Use an oil filling device to fill up hydraulic oil through the oil filler pipe.
3. Wipe clean.
4. Check the hydraulic oil level through the sight glass.
5. Fill up if necessary.

Clean seawater strainer



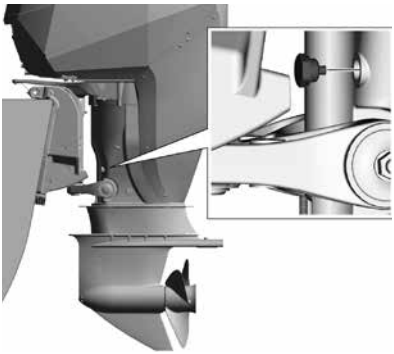
1. Remove the lid.
2. Pull out the strainer.
3. Clean the strainer, reinstall and close the strainer lid.

Replace air filter



1. Remove the clamp holding the filter.
2. Pull off the air filter.
3. Fit a new air filter.
4. Reinstall the clamp.

Change engine oil



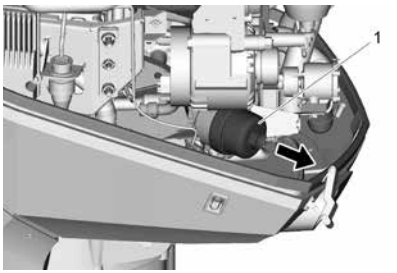
1. Remove the oil draining plug and washer.
2. Drain the engine oil into a suitable container.
3. Fit a ***NEW*** washer and tighten the oil draining plug to ***9 Nm (6.6 ft-lb).***

Replace engine oil filter

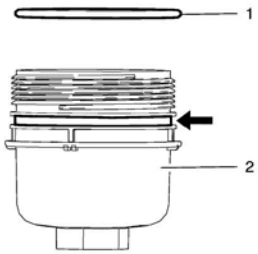
1. Place a suitable container below the oil filter.

NOTE! Use a 6-point socket to remove the oil filter cap.

2. Remove the oil filter cap ***(1)***.



3. Remove and discard the oil filter cartridge.
4. Remove the seal ring (1).

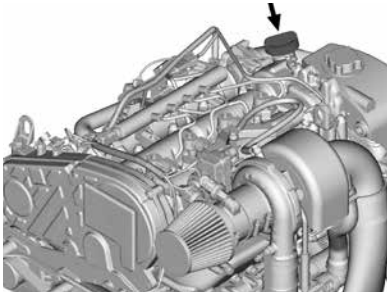


CAUTION

Lubricant must be applied to the threads of the oil filter cap prior to installation. Failure to lubricate the oil filter cap threads can hinder later removal and cause possible oil filter cap damage.

5. Install the ***NEW*** seal ring ***(1)*** with clean engine oil to the oil filter cap ***(2)***.

Filling up engine oil



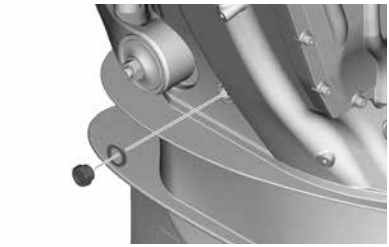
1. Fill up the engine oil through the oil filler neck.
2. Check engine oil level. Refer to section ***OPERATION.***
3. Close the filling cap and wipe clean.

Change lower belt oil

1. Remove the magnetic plug and washer ***(1)*** above the anti-cavitation plate.
2. Remove the magnetic plug and washer ***(2)***under the propeller shaft housing. Drain the oil into a suitable container.
3. Check drained oil quality:
   The oil should be red to dark red.
   If the oil looks milky and foamy, water has entered the lower housing. Check for leakage!

NOTE! Clean the magnetic oil plugs. Install ***new*** seals.

4. Reinstall and tighten oil plug ***(2)*** to ***9 Nm (6.6 ft-lb)***.



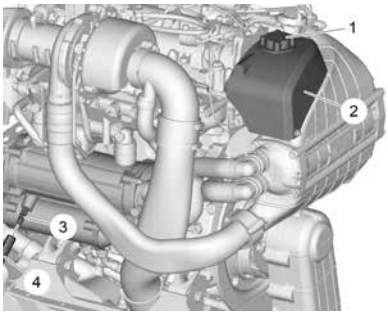
5. Remove the sight glass and washer. Fill up with Hydraulic oil until the oil comes out at the upper oil plug ***(1)***. Refer to ***Recommended fluids and grease***.
6. Clean the sightglass. Install a ***new*** seal.
   Tighten to ***16 Nm (11.8 ft-lb)***.

1. Alternatively, use an oil filling device and fill up the oil through the oil plug hole ***(2)*** until oil comes out at ***oil plug hole (1)***.

NOTE! Clean the magnetic oil plugs. Install ***new*** seals.

2. Remove the filling hose and tighten oil plug ***(2)*** and ***(1)*** to ***9 Nm (6.6 ft-lb)***.

Change coolant



1. Remove the cap ***(1)*** of the expansion tank ***(2)***.
2. Fit a hose ***(4)*** to the coolant drain adapter ***(3)***.
3. Drain the coolant/water mixture into a suitable container.
4. Remove the hose ***(4)*** from the drain adapter.
5. Fill up with coolant/water-mixture at the expansion tank cap up to 4 cm below filling neck. Refer to ***Recommended fluids and grease***.

The cooling system of the engine is to be filled with a mixture of distilled water and antifreeze based on ethylene glycol and/or anticorrosion additive.

WARNING!

Use only approved fluids, lubricants etc. see *Recommended fluids and grease*. Otherwise the manufacturer's warranty will become null and void.

Coolant must be added at the ***filler cap only***.

NOTE! Do not add cold coolant to a warm engine.

Ensure that the mixing ratio "water-antifreeze" is preserved.

6. Slowly fill up with coolant via filler neck on expansion tank until fluid level has reached just above the divider in expansion tank.
7. Let engine run at a speed of 2,000 rpm for approx. 15 min.
8. Switch off engine, carefully turn the cap to relieve pressure.

DANGER!

Do NOT open cap until pressure is released. Risk of scalding and burning injuries!

9. Top up to 4 cm below filling neck.
10. Before the next engine start-up (with the engine cold) check the coolant level and top up if necessary.
11. Repeat this procedure until no more coolant can be added.

DANGER!

If, in an exceptional case, the coolant level has to be checked in an engine that has reached operating temperature, first carefully turn the cap (large cap) with safety valve to the first stop, let off pressure, then open carefully.

NOTE! Do not open the cooling system when the engine is at operating temperature. This causes a pressure loss in the cooling system.

If the cooling system has been opened when the engine is at operating temperature this can lead to the alarm ***pressure in the expansion tank*** when the engine is then put into operation and to a reduction in the engine output.

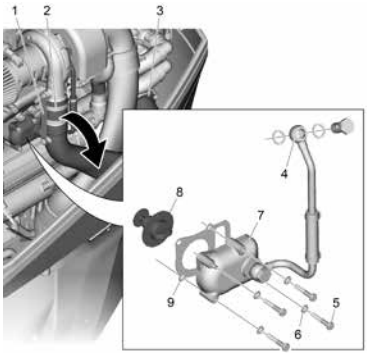
Coolant pressure in the expansion tank is only built up again when the engine has cooled down.

The cooling system must therefore only be filled up when the engine is cold.

WARNING!

When the cover is opened with working valves, there is a danger that it is not properly sealed when closed again. The required overpressure is no longer set up in the cooling system. Premature simmering and loss of coolant result. To avoid damage to the engine, this cover should as a general rule only be opened in exceptional cases and then replaced by a new one.

Replace thermostat

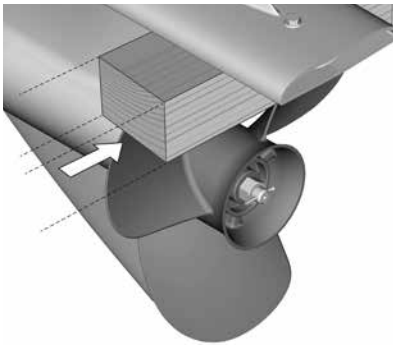


1. Remove the pressure pipe retainer ***(1)*** and the clamp ***(2)***.
2. Remove the Pressure pipe intercooler retainer ***(3)***.
3. Loosen the pressure pipe assembly.
4. Remove the turbo water out pipe ***(4)***.
5. Loosen screws ***(5)***, washers ***(6)***, and thermostat housing lid ***(7)***.
6. Remove thermostat ***(8)*** and gasket ***(9)***.
7. Clean thermostat housing.
8. Install a ***new*** thermostat.

NOTE! Install a ***new*** gasket.

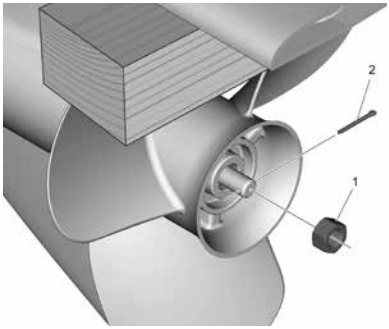
9. Reinstall the thermostat housing lid with 4 screws and washers.
10. Fill up according to ***Filling coolant***.

REPLACE PROPELLER



WARNING

Do not use any body parts to hold the propeller when loosening or tightening the propeller nut.



1. Straighten the cotter pin ***(2)*** and pull it out using a pair of pliers.
2. Remove the propeller nut ***(1)***.
3. Remove the propeller and propeller washer.

4. Apply marine grease according to table ***Recommended fluids and grease*** to the propeller shaft.
5. Install the propeller washer and propeller on the propeller shaft.

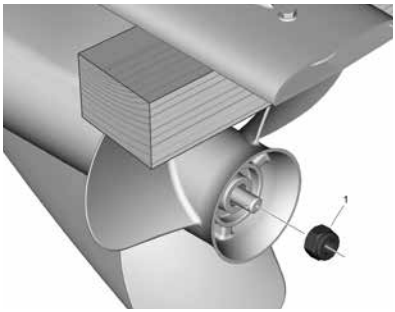
NOTE! Be sure to install the propeller washer before installing the propeller, otherwise the lower case and propeller boss could be damaged.

CAUTION

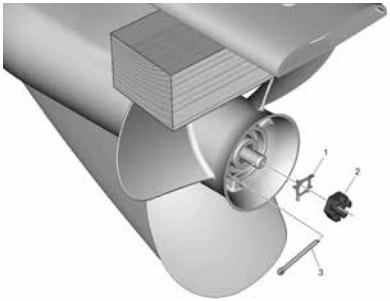
Be sure to use a new cotter pin and bend the ends over securely. Otherwise the propeller could come off during operation and be lost.

NOTE! We recommend a using a new hub kit when mounting a propeller. Contact your OXE Diesel dealer or propeller manufacturer!

NOTE! Some outboards are equipped with a Nyloc locking nut (1) and do not have a cotter pin. Do ***NOT*** reuse a Nyloc locking nut!



NOTE! Some models use a retainer ***(1)*** and a castlelated nut ***(2)*** combined with a cotter pin ***(3)***.



6. Tighten the propeller nut to the specified torque.
   Propeller nut tightening torque: 75.0 Nm (55.6 ft-lb).
7. Align the propeller nut with the propeller shaft hole. Insert a new cotter pin in the hole and bend the cotter pin ends.

NOTE! Do not reuse the cotter pin installed. Otherwise the propeller can come off during operation.

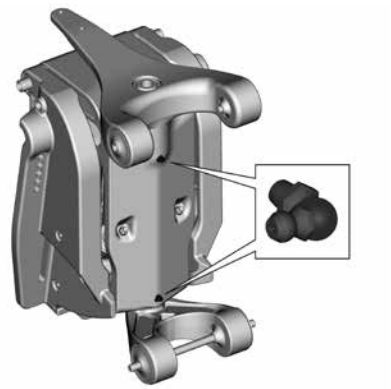
NOTE! If the propeller nut does not align with the propeller shaft hole after tightening to the specified torque, tighten the nut further to align it with the hole.

Ensure that the propeller is undamaged and rotates freely of the lower housing.

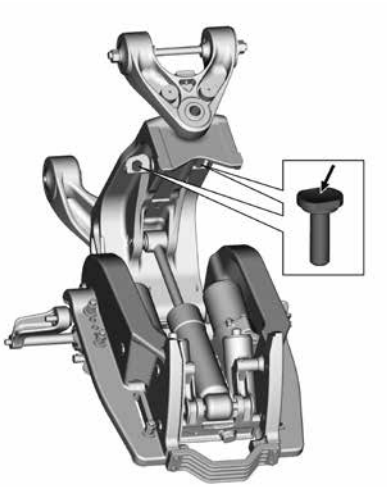
NOTE! Always have an extra propeller including necessary tools on board.

LUBRICATING AND GREASING

Power trim and tilt unit



1. Use a grease gun and fill up with recommended grease until the grease comes out at the joints or ends of shaft.Refer to ***Recommended fluids and grease.***



2. Fill the seatings with grease for smoother tilt operation. Use grease according to ***Recommended fluids and grease***.

MAINTENANCE SCHEDULE

DAILY CHECK-UP

Checklist				
Check daily	**Check**	**Fill up**	**Clean**	**Refer to**
Before start-up - Seawater strainer	X		if neces-sary	Clean Seawater strainer
- Engine oil dip stick	X	if neces-sary		Engine oil and oil filter replacement
- Water separator, engine oil filter	Drain			Engine oil and oil filter replacement
Start engine - Alternator loading	X			Read 13 V+ on engine display, refer to Display Manual
- Telltale not blocked	X		Daily with a pipe cleaner	Warming up the engine

INSPECTION PRIOR TO EACH SERVICE EVENT

Checklist					
	Check	**Fill up**	**Clean**	**Change/ Replace**	**Refer to**
Starting and warming up engine – Water/oil/fuel leakage – Power trim, function and leakage – No DTCs are triggered (diagnostic tool) – Unusual engine/ transmission sounds	X				
Stop engine – Engine oil and filter				X	User's Manual Change fluids and filters
Restart engine – Oil pressure – Oil leakage	X				Display manual

FIRST INSPECTION

Checklist					
1st inspection, after 50 h	**Check**	**Fill up**	**Clean**	**Change/ Replace**	**Refer to**
Condition of rubber hoses, pipes, connections and clamps (leakage, wear, aging) – Coolant hoses – Hydraulic hoses – Fuel hoses – Exhaust hoses	X				Workshop Manual Outboard views
Display/gauges, function	X				Display manual
Sea water strainer			X		Change fluids and filters
Coolant level and mixture	X				Check cooling system
Power trim and tilt unit (PTT-unit) - Fluid level - Magnetic plug - Seal	X		X	X	Check fluid level in power trim and tilt unit
Upper belt oil - Magnetic plug - Seal			X	X X	Workshop Manual Change upper belt oil
Upper belt tension	X				Workshop Manual Check upper belt tension
Gear box - Hydraulic oil and filter - O-ring, filter				X X	User's Manual Change fluids and filters
Gear box - Magnetic oil plug - Seal			X	X	Change fluids and filters
Lower belt oil - Magnetic oil plug - Seal			X	X X	Workshop Manual Change lower belt oil
Lower belt tension	X				Workshop Manual Check lower belt tension

SERVICE AT 200 HOURS

Checklist					
Every 200 h or once a year	**Check**	**Fill up**	**Clean**	**Change/ Replace**	**Refer to**
Condition of rubber hoses, pipes, connections and clamps (leakage, wear, aging) - Coolant hoses - Hydraulic hoses - Fuel hoses - Exhaust hoses	X				Workshop Manual Outboard views
Display/gauges function	X				Display manual
Air filter				X	User's Manual Change air filter
Turbo charger			X		Workshop Manual Air filter replacement
Exhaust tube	X				Workshop Manual Outboard views
Alternator drive belt tension	X				Self adjusting
Seawater strainer			X		User's Manual Change fluids and filters
Sea water pump, impeller and gasket				X	Workshop Manual Seawater pump impeller repl.
Fuel filter Fuel prefilter (if installed)				X	User's Manual Change fluids and filters

Checklist

Every 200 h or once a year	Check	Fill up	Clean	Change/ Replace	Refer to
Coolant level and mixture	X				User's Manual Check cooling system
Engine oil and filter				X	User's Manual Change fluids and filters
Upper belt tension	X				Workshop Manual
Upper belt oil, magnetic plug, seal	X				Workshop Manual Change upper belt oil
Gearbox, oil and filter, gasket				X	Workshop Manual Hydraulic oil filter repl.
Gearbox - Magnetic plug - Seal			X	X	Workshop Manual Hydraulic oil filter replacement
Lower belt tension	X				Workshop Manual
Lower belt oil, - Magnetic plug - Seal	X				User's Manual Change lower belt oil
Anodes. Intercooler, heat exchanger, transom mount, anti-cavitation plate				X	User's Manual Checking and other maintenance
Fluid level (PTT-unit)	X				User's Manual Checks before start-up
Painting			X		User's Manual Checking and other maintenance

SERVICE AT 800 HOURS

Checklist					
Each 800 h/once every 3rd year minimum	**Check**	**Fill up**	**Clean**	**Change/ Replace**	**Refer to**
Condition of rubber hoses, pipes, connections and clamps (leakage, wear, aging) - Coolant hoses - Hydraulic hoses - Fuel hoses - Exhaust hoses	X				Workshop Manual Outboard views
Display/Gauges, function	X				Display Manual
Cables, connectors, and cable glands	X				Installation manual
Air filter				X	User's Manual Change fluids and filters
Turbo charger	X		X		Workshop Manual Air filter replacement
Alternator drive belt				X	Alternator drive belt replacement
Coolant				X	Workshop Manual Drain and fill coolant
Coolant level and mixture	X				User's Manual Checking and other maintenance
Heat exchanger	X				Workshop Manual Cleaning heat exchanger
Intercooler, anode				X	User's Manual Checking and other maintenance

Checklist					
Each 800 h/once every 3rd year minimum	**Check**	**Fill up**	**Clean**	**Change/ Replace**	**Refer to**
Engine oil and filter				X	User's Manual Change fluids and filters
Upper belt				X	Workshop Manual Upper belt tension
Upper belt housing, gear pulleys, bearings, gaskets and sealings, engine adapter shaft	X				Workshop Manual Upper belt replacement
Upper belt seals				X	Workshop Manual Check belt pulley seals
Seawater pump, impeller and gasket				X	Workshop Manual Seawater pump, impeller repl.
Gearbox shaft in, pulleys and splines	X				Workshop Manual Lower belt replacement
Gearbox/propellershaft, pulleys and splines, wear and straightnes	X			X	Workshop Manual Lower belt replacement
Gear, function and wear	X				Workshop Manual Lower belt replacement
Gearbox seals				X	Workshop Manual Lower belt replacement
Lower belt and related parts				X	Workshop Manual Lower belt replacement
Lower belt oil - Magnetic plug - Seal	X		*X*	X X	Workshop Manual Lower belt replacement

Checklist					
Each 800 h/once every 3rd year minimum	**Check**	**Fill up**	**Clean**	**Change/ Replace**	**Refer to**
Propeller shaft oil seal				X	Workshop Manual Propeller replacement
Propeller shaft, check straightness and splines condition.	X				Workshop Manual Lower belt replacement
Lower belt tension	X				Workshop Manual Check lower belt tension
Upper belt oil - Magnetic oil plug - Seal			X	X X	Workshop Manual Upper belt replacement
Upper belt tension	X				Workshop Manual Check belt pulley seals
Power trim and tilt unit (PTT-unit) - Fluid level	X				User's Manual Before start-up
Trim pistons (PTT-unit), leakage	X				Workshop Manual Check trim and tilt system
Bushings/shafts in transom mount	X				Installation Manual

OXE ENGINE FAULT CODES

Column 1 shows the Suspect Parameter Number (SPN).

Column 2 shows the Failure Mode Indentifier (FMI).

Column 3 gives a short description of the fault.

SPN	FMI	Description
97	31	Water in fuel is detected.
100	1	Engine oil pressure - Data valid but below normal operational range
100	3	Engine oil pressure sensor - Voltage above normal, or shorted to high source
100	4	Engine oil pressure sensor - Voltage below normal, or shorted to low source
102	0	Manifold air pressure - Data valid but above normal operational range
102	3	Manifold air pressure sensor - Voltage above normal, or shorted to high source
102	4	Manifold air pressure sensor - Voltage below normal, or shorted to low source
102	14	Manifold air pressure - Control error
105	3	Manifold air temperature sensor - Voltage above normal, or shorted to high source
105	4	Manifold air temperature sensor - Voltage below normal, or shorted to low source
107	0	Air filter differential pressure sensor - Data valid but below normal operational range
107	3	Air filter differential pressure sensor - Voltage above normal, or shorted to high source
107	4	Air filter differential pressure sensor - Voltage below normal, or shorted to low source
108	3	Ambient pressure sensor - Voltage above normal, or shorted to high source
108	4	Ambient pressure sensor - Voltage below normal, or shorted to low source
110	0	Engine coolant temperature sensor - Data valid but above normal operational range

SPN	FMI	Description
110	3	Engine coolant temperature sensor - Voltage above normal, or shorted to high source
110	4	Engine coolant temperature sensor - Voltage below normal, or shorted to low source
127	0	Gearbox oil pressure - Data valid but above normal operational range
127	1	Gearbox oil pressure - Data valid but below normal operational range
127	3	Gearbox oil pressure - Voltage above normal, or shorted to high source
127	4	Gearbox oil pressure - Voltage below normal, or shorted to low source
157	0	Fuel rail pressure - Data valid but above normal operational range
157	3	Fuel rail pressure sensor - Voltage above normal, or shorted to high source
157	4	Fuel rail pressure sensor - Voltage below normal, or shorted to low source
157	14	Fuel rail pressure - Control error
158	3	Battery potential - Voltage above normal
158	4	Battery potential - Voltage below normal
171	0	Ambient air temperature - Data valid but above normal operational range
171	3	Ambient air temperature sensor - Voltage above normal, or shorted to high source
171	4	Ambient air temperature sensor - Voltage below normal, or shorted to low source
173	0	Exhaust gas temperature is to high
173	3	Exhaust gas temperature sensor- Voltage above normal, or shorted to high source
173	4	Exhaust gas temperature sensor- Voltage below normal, or shorted to low source
175	0	Engine oil temperature sensor - Data valid but above normal operational range

SPN	FMI	Description
175	3	Engine oil temperature sensor - Voltage above normal, or shorted to high source
175	4	Engine oil temperature sensor - Voltage below normal, or shorted to low source
177	0	Gearbox oil temperature - Data valid but above normal operational range
177	3	Gearbox oil temperature - Voltage above normal, or shorted to high source
177	4	Gearbox oil temperature - Voltage below normal, or shorted to low source
651	5	Fuel injector 1, Cylinder 1 - Low current or open circuit
652	5	Fuel injector 2, Cylinder 3 - Low current or open circuit
653	5	Fuel injector 3, Cylinder 4 - Low current or open circuit
654	5	Fuel injector 4, Cylinder 2 - Low current or open circuit
1136	0	ECU temperature sensor - Data valid but above normal operational range
1136	0	ECU temperature sensor - Voltage above normal, or shorted to high source
1136	0	ECU temperature sensor - Voltage below normal, or shorted to low source
2433	0	Exhaust gas temperature - Data valid but above normal operational range
2795	14	VGT control error
2899	12	Glow Module - Fault
3509	3	ECU 5V sensor supply 1 - Voltage above normal, or shorted to high source
3509	4	ECU 5V sensor supply 1 - Voltage below normal, or shorted to low source
3510	3	ECU 5V sensor supply 2 - Voltage above normal, or shorted to high source
3510	4	ECU 5V sensor supply 2 - Voltage below normal, or shorted to low source

SPN	FMI	Description
5324	31	Glow Plug - Fault
521104	31	Controlhead communication timeout
521105	6	PSU Glow Plug Module - Current above normal or grounded circuit
521106	6	PSU Trim/Tilt - Current above normal or grounded circuit
521107	0	Actuator feedback message not received (ECU-ECU)
521108	14	Engine speed control error
521109	0	Gear position error Fwd or Rev
521110	0	Gear position error N
521112	31	VGT LMSP or UMSP check failed Power Up
521113	0	VGT control position error is detected
521114	31	VGT LMSP or UMSP check fail Idle
521115	0	N/A
521116	0	N/A
521117	0	N/A
521118	6	Start motor circuit - Current above normal or grounded circuit (SWSUP1)
521119	0	N/A
521120	31	Engine has stalled
521121	0	N/A
521122	0	N/A
521123	0	N/A
521124	6	Fuel pump - Current above normal or grounded circuit
521125	0	Swirl Valve Electrical fault
521126	0	Trolling Valve Electrical Fault
521127	31	Fwd or rev gear solenoid electrical fault
521128	31	VGT control electrical fault

SPN	FMI	Description
521129	6	Any SWSUP High
521130	6	Fuel rail pressure valve - Current above normal or grounded circuit
521131	0	N/A
521132	3	Trim angle sensor - Voltage above normal, or shorted to high source
521132	4	Trim angle sensor - Voltage below normal, or shorted to low source
521133	31	Glow Plug or Module Error
521134	0	N/A
521135	0	Glow Module Communication Error

OXE CONTROLS FAULT CODE LIST

J1939 SPN	J1939 FMI	Description
521344	2	Control head 0 port lever pot failure [2]
521345	2	Control head 1 port lever pot failure [2]
521360	2	Control head 0 port lever pot mismatch [2]
521361	2	Control head 1 port lever pot mismatch [2]
521440	2	Control head 0 stbd lever pot failure [2]
521441	2	Control head 1 stbd lever pot failure [2]
521456	2	Control head 0 stbd lever pot mismatch [2]
521457	2	Control head 1 stbd lever pot mismatch [2]
521504	13	Control head 0 invalid configuration [1]
521505	13	Control head 1 invalid configuration [1]
521520	13	Control head 0 invalid calibration [1]
521521	13	Control head 1 invalid calibration [1]
521536	31	Control head 0 duplicate instance [1]
521537	31	Control head 1 duplicate instance [1]
521552	31	Control head 0 take command button fault [2]
521553	31	Control head 1 take command button fault [2]
521568	31	Control head 0 sync button fault [2]
521569	31	Control head 1 sync button fault [2]
521584	31	Control head 0 port neutral button fault [2]
521585	31	Control head 1 port neutral button fault [2]
521600	31	Control head 0 stbd neutral button fault [2]
521601	31	Control head 1 stbd neutral button fault [2]
521616	31	Control head 0 multiple controllers selected [1]
521617	31	Control head 1 multiple controllers selected [1]

[1] Calibration possible

[2] Require control replacement or hardware repair

TROUBLE SHOOTING

Refer to ***Workshop Manual.***

TECHNICAL DATA

OXE125/150/175/200 HP

Application	Specification	
	Metric	US units
Engine type	Diesel, L4	
Displacement	1956 cc	122 cu in
Intake	VGT turbocharged, intercooled	
Max. power at engine speed 4100 RPM	92/110/129/147 kW	125/150/175/200 HP
Max. engine torque at engine speed at 2500 rpm	376/380/380/415 Nm	510/515/515/563 lb ft
Fuel	Diesel	
Dry weight	350 kg	772 lbs
Wet weight	358 kg	789 lbs
Alternator output	130 A	
Rig length	25" or 33"	
Cooling	Closed cooling circuit, heat exchanger/seawater	
Starting	Electric	
Shift	Electro-hydraulic	
Clutch	Hydraulic multi-friction plate	
Gear ratios	High speed - 1.73:1 High speed torque - 2.17:1	
Dimensions, L x H x W 25" leg 33" leg	 994 x 1880 x 678 mm 994 x 2083 x 678 mm	 39 x 74 x 27 in 39 x 82 x 27 in

RECOMMENDED FLUIDS AND GREASE

		Quantity	
Fluid	**Quality**	**Metric**	**US units**
Fuel	EN 590 (with national environmental and cold weather standards) ASTM D 975 No. 1 and No. 2 JIS KK 2204 NATO Code F54 and F75	-	-
Engine oil	**OXE Engine Oil** or 5w-30 dexos2 API SM/CF GM-LL-A025/ B025 ACEA A3/B4 [2]	5.5 liters [1] [3] 7.0 liters [1] [4]	5.8 quarts [1] [3] 7.4 quarts [1] [4]
Gear box oil	**OXE Gearbox Oil** or Fully Synthetic Dual Clutch Transmission Fluid - DCT	2.0 liters [1]	2.1 quarts
Coolant	**OXE Coolant** or GM Long-Life Coolant - Specification B040 1065/ Distilled water (30/70)	7.5 liters	7.9 quarts
Grease	**OXE Grease** or DIN 51502:KP2.5K-20 ISO 6743: ISO-L-XBCEB2.5	-	-
Power trim and tilt unit PTT	**OXE PTT Oil** or ATF Dexron II	0.5-0.7 liters	0.52-0.73 quarts
Upper belt oil	**OXE Belt Transmission Oil** or Fully Synthetic Transmission Fluid - ATF / Dexron HP	0.33 liters	0.34 quarts
Lower belt oil	**OXE Belt Transmission Oil** or Fully Synthetic Transmission Fluid - ATF / Dexron HP	2 liters	2.1 quarts

[1] Refer to ***Workshop Manual***

[2] For cold climate, select viscosity according to table ***OXE Engine oil Viscosity***.

[3] Volumes for engines 125 and 150 HP

[4] Volumes for engines 175 and 200 HP

NOTE! The fuel must meet national and international standards.

NOTE! Only use fuel, lubricants etc. in accordance with Cimco Marine AB regulations. Otherwise the manufacturer's liability for defects will not apply!

DIESEL FUEL

The composition of the fuel is vital for operation of the OXE outboard, its service life, and emissions. To meet the performance specified and to run the boat cleanly and quietly, it is important that fuel as recommended in table ***Recommended fluids and grease*** is used.

If national emission regulations permit OXE Diesel engines can be operated on commercially available diesel fuels with less than 0.05% sulfur content.

Fuel sulfur content	≤0.05% (≤500 ppm)	>0.05% - 0.5% (>500-5000ppm[2)])
Engine il change intervals	200 h or one year	100 h or one year[1)]

[1)] If the sulfur content is higher than 0.05%, the intervals between engine oil changes should be halved or determined by frequent oil sampling.

[2)] If the sulfur content is higher than 0.1% an engine lubrication oil with suitable TBN shall be used.

NOTE! Do not use fuel with more than 0.5% sulfur content!
Using fuel with high sulfur content will increase the outboard´s emission levels and cause excessive wear and shorter life time.

Large differences in composition occur in local fuel specification. This can result in higher fuel comsumption, higher emissions and less power output.

AVOIDING FUEL FLOW RESTRICTIONS

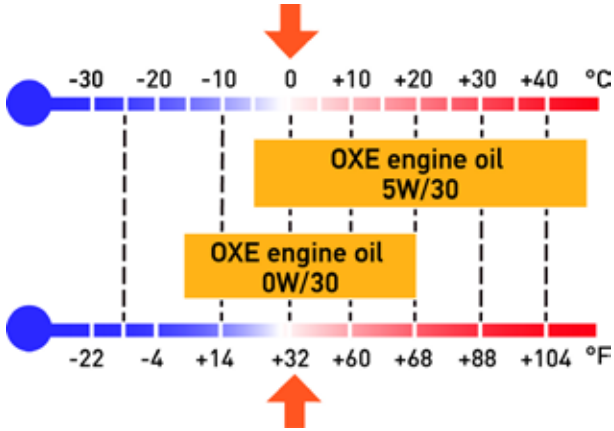
WARNING

Adding additional components to the fuel supply system such as filters, valves, fittings, etc. may restrict the fuel flow. This could cause engine stalling at low speed, and/or a lean fuel condition at high RPM, that could cause engine damage.

ENGINE OIL VISCOSITY

Select viscosity according to table.

The temperature values refer to stable ambient temperatures.



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OXE
DIESEL

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