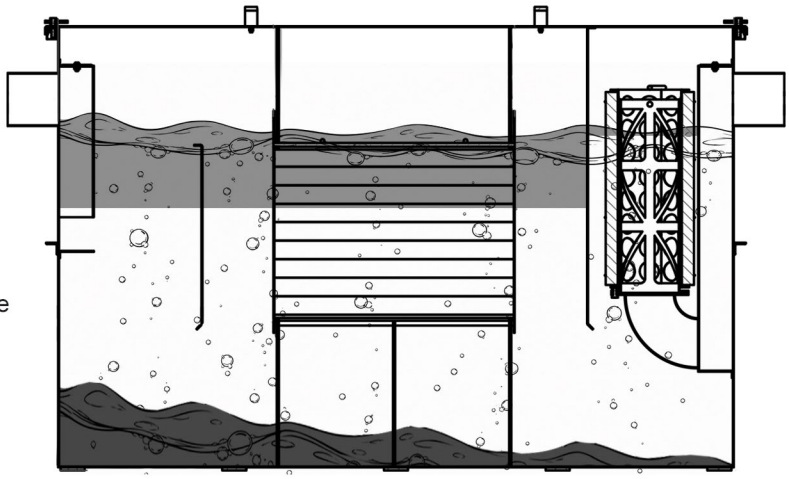
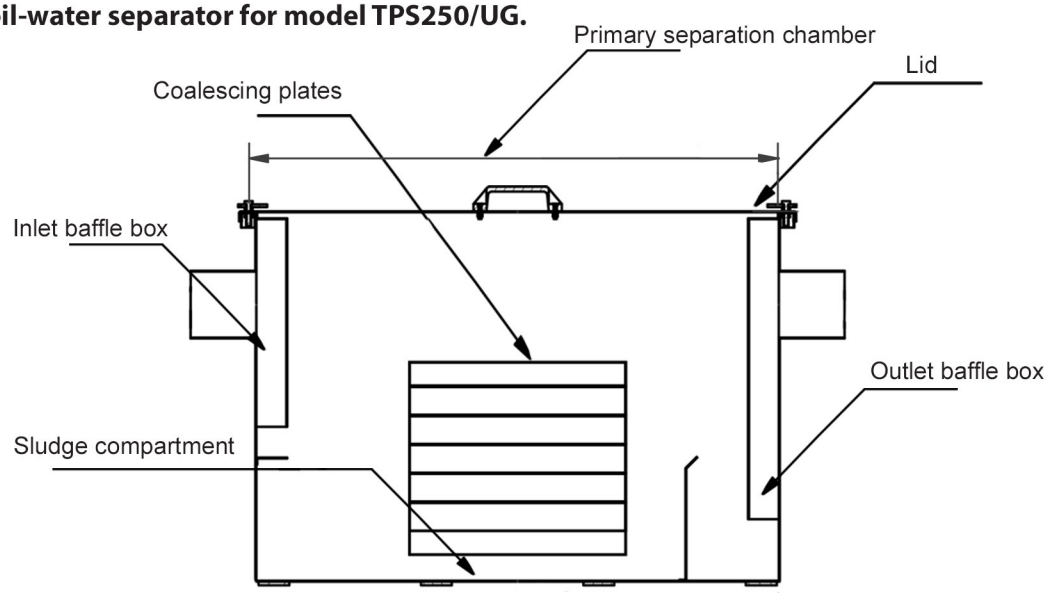
GCT OIL-WATER SEPARATOR OPERATION & MAINTENANCE

Operating Principle

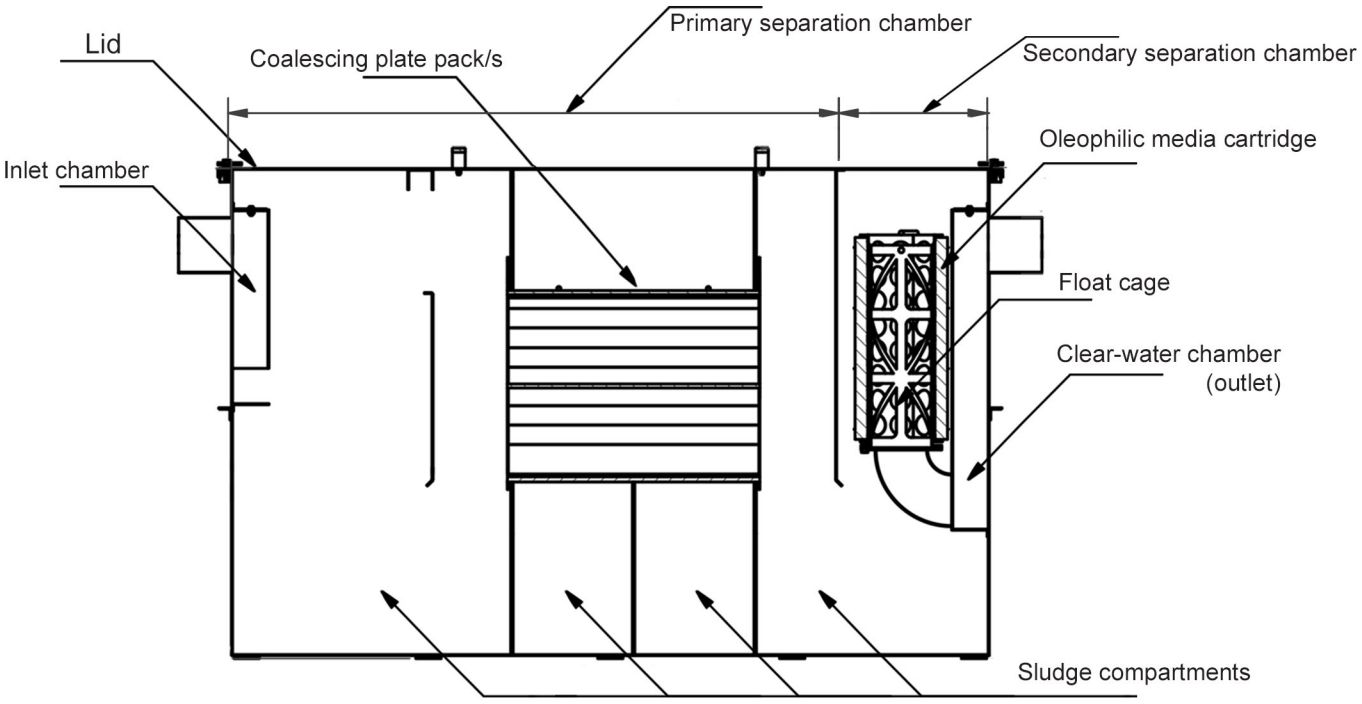


A GCT oil-water separator removes non-emulsified oil, and solids from wastewater through gravity separation and coalescence. Wastewater enters the separator, where heavy solids settle into the sediment/sludge chamber and free oil rises to the surface. The remaining wastewater then passes through the primary patented coalescing plate pack where smaller oil droplets join together, rise to the surface, and separate from the water. The water then passes through the secondary coalescing filter (CFI separators only) at the outlet end of the separator. where it captures smaller suspended oil droplets that remain after the plate pack. The droplets combine into larger droplets and rise back to the oil layer, providing a final polishing stage before treated water discharges. The result is an oil layer on the top, clean water remains in the middle, and heavier sludge settles at the bottom. Each layer must be removed or cleaned out regularly to keep the separator operating effectively.
GCT oil-water separators are up to 80% smaller than conventional gravity separators with the same flow rates because they utilise a patented, two-stage coalescing system and controlled velocity, rather than relying on massive retention times. The GCT range of separators achieve superior separation in a smaller footprint.

1. Diagram of oil-water separator for model TPS250/UG.



2. Diagram of oil-water separator, for models CFI500/UG,CFI1000/UG, CFI2000/UG and CFI4000/UG.



Maintenance of GCT Oil-Water Separator

Introduction

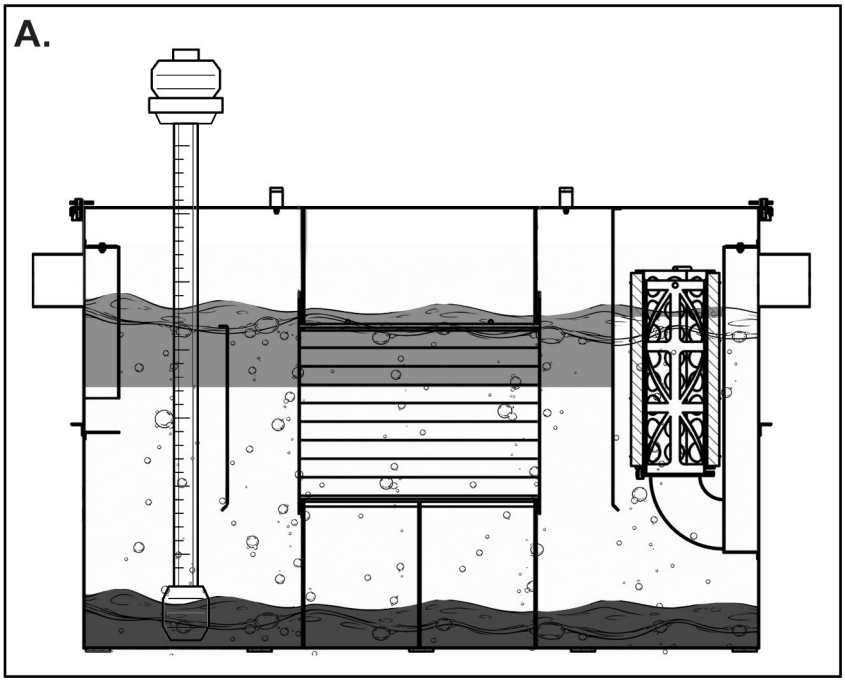
The maintenance of an oil-water separator should not be based solely on fixed calendar intervals. While manufacturers may recommend routine inspection and servicing frequencies, the actual maintenance requirements are highly site-specific and depend on the quantity, type, and rate of contaminants entering the separator.

Two facilities operating identical oil-water separators may require significantly different maintenance schedules due to variations in wastewater characteristics, hydraulic loading, operating hours, housekeeping practices, and environmental conditions. For this reason, maintenance should be based on the condition and performance of the separator rather than on elapsed time alone.

Short-Term vs Long-Term Maintenance

Short-term maintenance consists of routine inspections and preventative servicing to maintain separator performance between major clean-outs. Typical activities include monitoring contaminant accumulation, removing floating debris, cleaning the secondary coalescing filter cartridge**,** selectively skimming the accumulated free oil layer while leaving the water layer undisturbed where practicable, and inspecting internal components to ensure the separator continues to operate efficiently.

Long-term maintenance involves a complete service of the separator, including the removal of all accumulated oil, sludge and wastewater (where required), thorough cleaning of the separator and its internal components, inspection for damage or wear, and restoration of the system to its full treatment capacity.



Why Maintenance Frequency Differs from Site to Site

The rate at which oil and sludge accumulate is influenced by numerous operational factors.

1. Oil Loading

Facilities generating high volumes of free oil and hydrocarbons require more frequent servicing. Typical examples include heavy vehicle workshops, fleet maintenance depots, heavy equipment workshops, engine and gearbox rebuilding facilities and fuel storage depots, which generally produce substantially greater hydrocarbon loads than conventional passenger vehicle wash bays.

2. Sediment Loading

Sediment loading is one of the primary factors affecting maintenance frequency. Sand, grit, soil, mud and other settleable solids accumulate within the sludge chamber or upstream sludge trap, reducing storage capacity and treatment efficiency.

High sediment loading commonly occurs at commercial car washes and automatic vehicle wash facilities, truck and bus wash bays, mining and construction sites, Fleet maintenance depots. earthmoving and agricultural operations and unsealed parking areas and access roads etc.

Although each vehicle contributes only a small amount of sediment, high daily vehicle throughput can rapidly fill the sludge chamber. As sludge accumulates, the effective treatment volume decreases, reducing separation efficiency and fouling coalescing media. Consequently, sludge removal is often required well before the separator reaches its oil
storage capacity.

3. Hydraulic Flow Rate

Higher hydraulic loading introduces contaminants at a faster rate, increasing the frequency of inspections and servicing. High-volume vehicle wash facilities, multiple wash bays and continuous industrial wash processes typically require more frequent maintenance.

4. Operating Hours

Separators operating continuously accumulate contaminants much faster than those used intermittently. Maintenance intervals should therefore be based on actual operating hours rather than calendar time.

5. Wastewater Characteristics

Wastewater quality varies between applications. Pressure washing, engine degreasing, workshop wash-downs and industrial process water may contain higher concentrations of oil, detergents, metal fines and suspended solids, all of which influence maintenance frequency. Detergents and degreasers can emulsify hydrocarbons, reduce oil droplet size, emulsified oils may pass through the separator untreated, increasing the risk of exceeding the applicable oil discharge limits and resulting in non-compliant effluent. In addition, emulsified oils and cleaning chemicals can accelerate the fouling of coalescing media, reducing separation efficiency and increasing the frequency of inspection and maintenance.

6. Housekeeping Practices

Good housekeeping significantly reduces contaminant loading. Sweeping floors before washing, cleaning oil spills with absorbent materials, preventing litter from entering drains and excluding stormwater from the process drainage system all help extend maintenance intervals.

7. Stormwater Ingress

Wash bays connected to an oil-water separator should, wherever practicable, be fully roofed to prevent stormwater from entering the treatment system. The ingress of stormwater increases the hydraulic loading on the separator,potentially compromising oil separation efficiency. Stormwater also introduces additional sand, silt, leaves and other debris, increasing sludge accumulation and the frequency of maintenance.

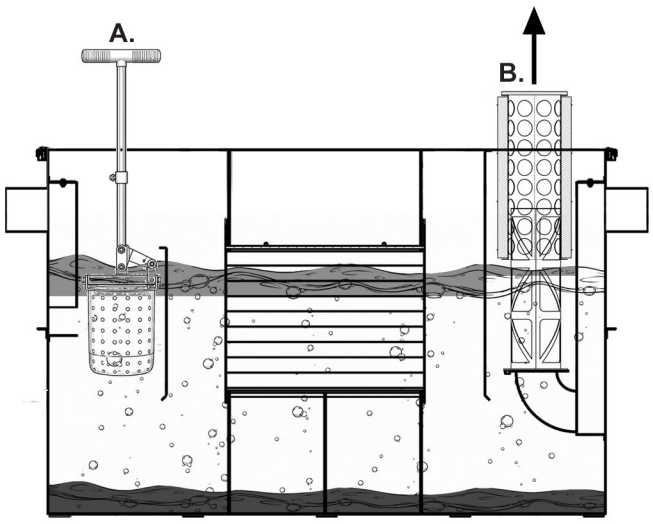
8. Recommended Maintenance Philosophy

Oil-water separator maintenance should be condition-based rather than time-based. Routine inspections should monitor the thickness of the floating oil layer, the depth of accumulated sludge, hydraulic performance, and the condition of internal components, with major servicing performed when contaminant storage limits are reached or separator performance begins to decline.A simple and effective method of implementing condition-based maintenance is through the routine use of a calibrated gauge stick with water finding paste **(Illustration A)**. During each inspection, the gauge stick is inserted vertically through the access opening to measure the thickness of the floating oil layer and the depth of settled sludge within the **primary separation chamber (refer to page 1 for diagram)**. By recording these measurements at regular intervals, the rate of contaminant accumulation can be established and maintenance scheduled based on the actual condition of the separator rather than fixed time intervals. An optional aftermarket oil and sludge monitoring system may be installed to provide operators with continuous level feedback and early warning of contaminant accumulation within the separator. These sensors can support condition-based maintenance by indicating when oil or sludge levels approach the separator's storage limits.Oil and sludge level sensors are not supplied as part of our separator package and fall outside our scope of supply. Where required, they must be specified, purchased, installed, and maintained separately by the customer or an appropriately qualified third-party supplier.

The separator should be serviced when either:
The floating oil layer reaches 80% of the certified oil storage capacity in the primary separation chamber , or
The sludge chamber reaches 50% of its available sludge storage capacity, whichever occurs first.

Short-Term Maintenance

The separator should be cleaned prior to or after the business day. The separator must not be cleaned while it is in operation and while receiving a flow of water through the inlet pipe.



1. Preparation
Separated liquid oil and vapours are flammable and/or combustible and should be treated as a fire hazard. Use appropriate PPE and procedures
- Wear appropriate personal protective equipment (PPE).
- Isolate the work area using suitable barriers and warning signage where required.
- Assemble the required maintenance equipment, including skimming net, oil absorbent pads, and suitable waste containers.

2. Remove the lid
- Remove the stainless steel lid or manhole cover.
- Carefully place the lid/ cover on a clean, stable surface to prevent damage.

3. Remove secondary coalescing filter cartridge
- Remove and inspect the secondary coalescing filter cartridge in the final chamber **(B)**.
- Rinse the filter media with a normal-pressure garden hose; do not use a high-pressure washer.
- Replace damaged or heavily fouled cartridges.

Note: The TPS250/UG separator is not fitted with a removable secondary coalescing filter. This step is therefore not applicable and should be omitted.

4. Remove floating oil layer
- Skim or suction off the floating oil layer **(A)**, avoiding removal of water.
- Store recovered oil in a sealed, labelled container for disposal by an authorised provider.

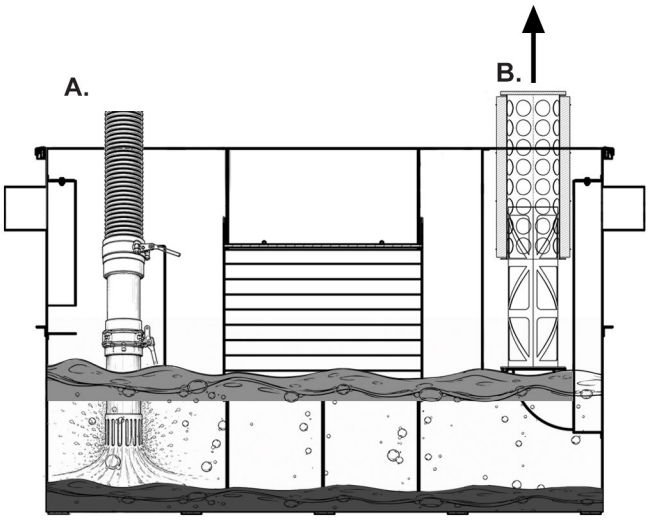
5. Re-install secondary coalescing filter cartridge
- Re-install the secondary coalescing filter cartridge in the final chamber **(B)**.

Note: The TPS250/UG separator is not fitted with a removable secondary coalescing filter. This step is therefore not applicable and should be omitted.

6. Refill
Refill the separator with clean water to the outlet-pipe invert level to restore the correct operating water level. This is essential to re-establish the separator's hydraulic seal and effective separation zone before wastewater enters the unit. Operating with an insufficient water level can allow oil and suspended contaminants to bypass the separation process, increasing the risk of effluent discharge limits being exceeded.

Long-Term Maintenance

The separator should be cleaned prior to or after the business day. The separator must not be cleaned while it is in operation and while receiving a flow of water through the inlet pipe.



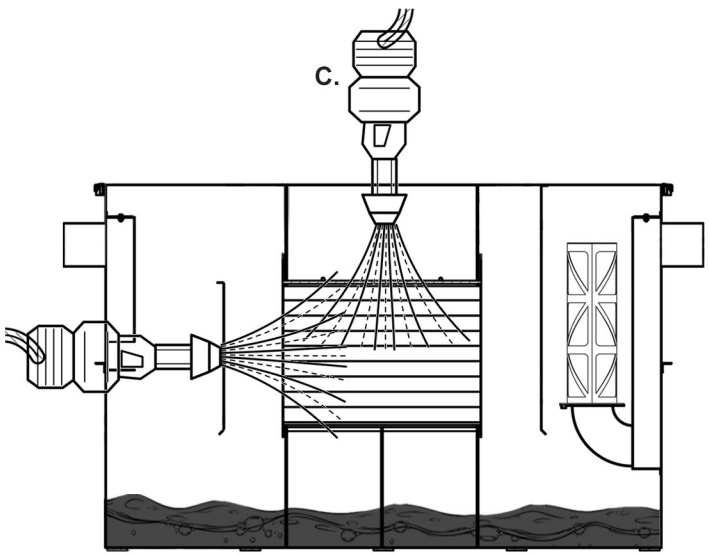
1. Preparation
Separated liquid oil and vapours are flammable and/or combustible and should be treated as a fire hazard. Use appropriate PPE and procedures
- Wear appropriate personal protective equipment (PPE).
- Isolate the work area using suitable barriers and warning signage where required.
- Assemble the required maintenance equipment, including skimming net, oil absorbent pads, and suitable waste containers.

2. Remove the lid
- Remove the stainless steel lid or manhole cover.
- Carefully place the lid/ cover on a clean, stable surface to prevent damage.

3. Remove secondary coalescing filter cartridge (B)
- Remove and inspect the secondary coalescing filter cartridge in the final chamber.
- Rinse the filter media with a normal-pressure garden hose; do not use a high-pressure washer.
- Replace damaged or heavily fouled cartridges.

Note: The TPS250/UG separator is not fitted with a removable secondary coalescing filter. This step is therefore not applicable and should be omitted.

4. Pump out all contents of the separator (A)
- Using a vacuum truck or industrial-grade suction pump, empty out the separator completely.
- Remove all retained wastewater, free oil and accumulated sludge, from the tank and sludge compartments.
- Continue vacuuming until no recoverable liquid or sludge remains, paying particular attention to low points, corners, and the area beneath the coalescing plates.



5. Internal High-Pressure Washing and coalescing plates flushing (C)
- Using a high-pressure hose, systematically spray the tank interior to dislodge hardened oil deposits and accumulated solids from the sidewalls, roof, and base.
- Spray through the coalescing plates to loosen and remove any oily solids or sludge adhering to the plates.
- Thoroughly flush the coalescing plates from the front, back and from above, using the high-pressure spray to dislodge all accumulated sludge, oil residue, and debris.
- Direct the spray down the vertical plates so that all loosened material is driven into the bottom sludge compartment for subsequent removal. The plates must be completely clear of sludge to maintain effective separation performance.
- Rotate and reposition the nozzle regularly to ensure all plate surfaces, channels, tank walls, top, and bottom are thoroughly cleaned.

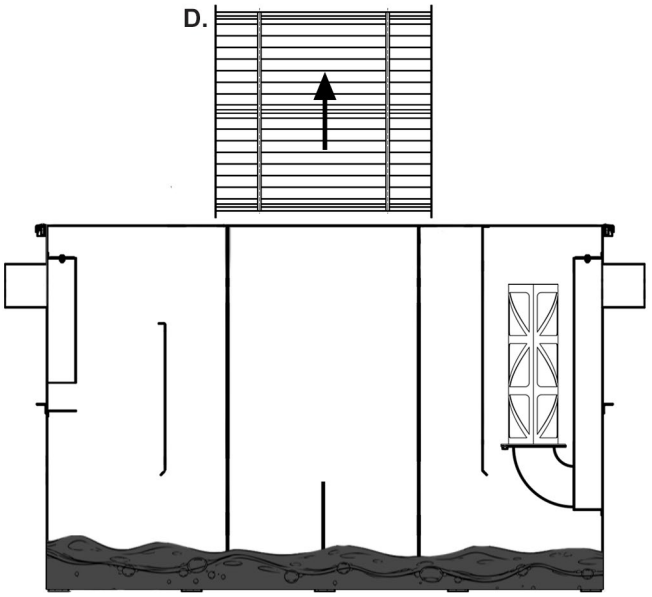
Maintenance procedure continued on the following page.

Long-Term Maintenance Continued

6. Remove coalescing plate pack/s (D)
Safety Note: Exercise extreme care when handling coalescer plate packs. The packs are manufactured from stainless-steel sheets, and exposed edges may be sharp. Wear suitable cut-resistant gloves and avoid contact with plate edges to prevent lacerations

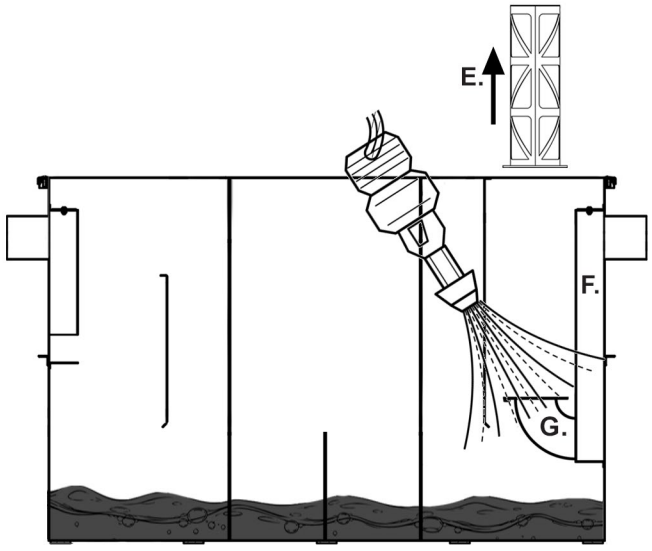
- Carefully lift out the coalescing plate pack(s) using the handles. Two or more persons are required to remove and reinstall larger plate packs safely.
- Handle each plate pack with extreme care: do not force, drop, throw, strike, or drag it during removal, cleaning, or storage. Rough handling may bend or deform the pack, causing permanent damage and preventing correct reinstallation.
- Place the removed plate pack(s) gently on a clean, level surface until ready for reinstallation

Important: The intended maintenance method is to remove the coalescing plate pack to provide full access to the sludge compartment. However, the new GCT-2G 2nd generation CFI separator design includes a fail-safe alternative where the plate pack cannot be removed.Dedicated access openings at the front and rear of the sludge compartment allow accumulated sludge and solids to be vacuumed or flushed out without removing the coalescer plate pack. This provision ensures that essential sludge removal can still be completed when direct access through the plate pack is not possible Older CFI separator models manufactured before 2026 do not include these access openings. For these units, the coalescing plate pack must be removed to access and clean the sludge compartment.
Note: The TPS250/UG separator has fixed, non-removable coalescing plates. This step is not applicable and must be omitted.



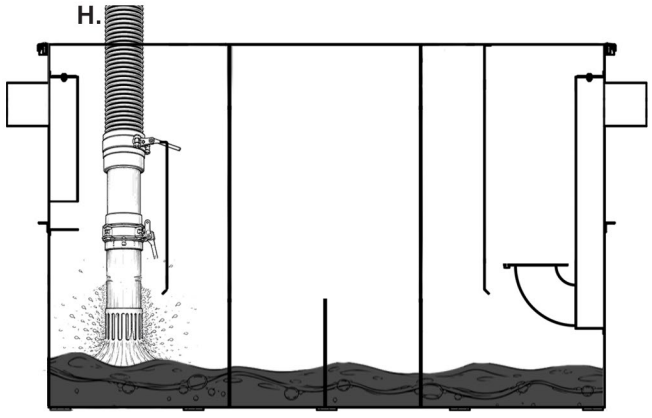
5. Clear-Water Chamber and Outlet Elbow Inspection and Cleaning
- Inspect the clear-water chamber **(F)** and upturned outlet elbow **(G)** during every major separator clean. If the separator has been overloaded or oil has bypassed the separation process, oil, sludge, and sediment may accumulate inside the outlet elbow and clear-water chamber, which can compromise final effluent quality.
- Remove the float cage **(E)** assembly, where applicable,by loosening the three M8 retaining nuts and carefully lifting the assembly clear.
- Use the inspection eye on top of the clear-water chamber to inspect the chamber and outlet elbow for contamination.
- If sludge or oil residue is present, use a high-pressure hose to flush the chamber and outlet elbow thoroughly until all contamination has been removed. Ensure that loosened material is directed for collection and removal.

Important: Cleaning the main separator alone is not sufficient. A contaminated clear-water chamber may cause the separator to exceed its effluent discharge limit. Inspection and cleaning of the clear-water chamber and outlet elbow are therefore essential during long-term maintenance.
Note: The TPS250/UG separator is not fitted with an upturned outlet elbow, inspection cover, or float cage. The above inspection procedure does not apply. Instead, thoroughly flush inside the outlet box baffle with high-pressure water to remove all accumulated oil, sludge, and sediment.



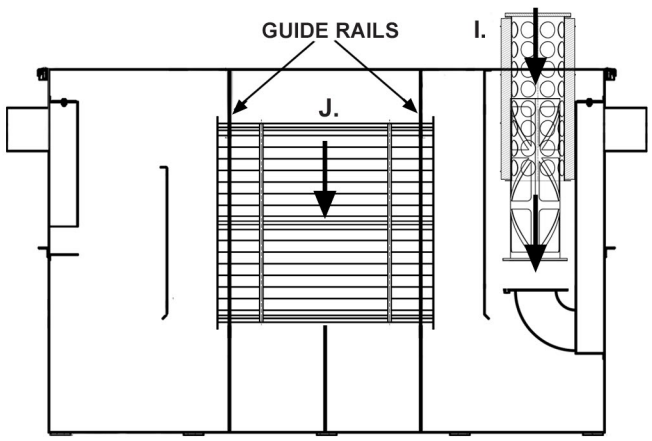
6. Final Vacuum Removal of Wastewater and Sludge (H)
- Upon completion of the above cleaning and flushing procedures, use a vacuum truck or industrial suction pump to remove all remaining wastewater, loosened sludge, oil residue, sediment, and debris from the separator, including the sludge compartment.

7. Reinstallation and Final Securement of Internal Components
- Reinstall the coalescing plate pack(s) **[J]**, ensuring that the separator guide rails locate inside the plate pack and that its internal side panels sit outside the guide rails.
- Confirm that each pack slides smoothly into position, is fully seated and securely supported.
- Reinstall the float cage, secondary coalescing filter cartridge **(I)** and all inspection covers, and ensure all nuts, bolts, and fasteners are securely tightened before returning the separator to service.



8. Refill
- Refill the separator with clean water to the outlet-pipe invert level to restore the correct operating water level. This is essential to re-establish the separator's hydraulic seal and effective separation zone before wastewater enters the unit. Operating with an insufficient water level can allow oil and suspended contaminants to bypass the separation process, increasing the risk of effluent discharge limits being exceeded.

9. Automatic Shut-Off Valve (Where Fitted)
An automatic shut-off valve uses a float-operated mechanism to close the separator outlet when the maximum oil-storage capacity is reached, preventing accumulated oil from discharging to the sewer or stormwater system.However, once the outlet closes, incoming rainwater or wastewater cannot pass through the separator. Without a suitable alarm system to alert operators that the separator is full and the outlet has closed, upstream flooding, overflow, or localised pollution may occur. For this reason, our standard separator design is supplied without an automatic shut-off float valve.Where a separator is fitted with an automatic shut-off valve, clean the float and float cage using a high-pressure spray to remove sludge and sediment. Inspect the float gasket and confirm that it is intact and correctly seated.After refilling the separator with clean water, verify that the float valve rises freely to the water surface within the float cage. If the float fails to rise or operates abnormally, remove it from service and inspect it for damage, contamination, or obstruction before recommissioning the separator



Applicability of These Instructions

These operation and maintenance instructions apply primarily to our current GCT-2G 2nd generation CFI oil-water separators and the TPS250/UG. While many procedures are also relevant to earlier separator models, older units may not be fitted with features such as a removable float cage or secondary coalescing filter cartridge.For these units, omit any steps relating to components that are not installed and follow the applicable maintenance procedures for the specific separator configuration.

Long-Term Maintenance Troubleshooting Guide

No.	Problem / observation	Possible cause	Required corrective action
1	Separator is receiving flow during maintenance	Unit has not been isolated or cleaning was scheduled during operating hours	Stop maintenance. Clean the separator only before or after the business day, when no water is entering through the inlet pipe.
2	Lid or manhole cover is scratched, bent, or unstable	Cover was dropped or placed on an unsuitable surface	Remove the cover carefully and place it on a clean, level, stable surface. Inspect it before refitting.
3	Secondary coalescing filter is blocked	Oil, sediment, or debris has accumulated in the cartridge	Remove and inspect the cartridge. Rinse the filter media with a normal-pressure garden hose. Replace the cartridge if heavily fouled or damaged.
4	Secondary filter media is damaged	High-pressure water was applied directly to the cartridge	Do not pressure-wash the cartridge. Replace damaged filter media and clean only with a normal-pressure hose.
5	No removable secondary coalescing filter is found	TPS250/UG separator configuration, or the filter was removed and not reinstalled	Confirm whether the unit is a TPS250/UG model. For other models, locate and reinstall the correct secondary coalescing filter before returning the separator to service.
6	Hardened oil deposits remain on tank surfaces	Inadequate cleaning coverage or insufficient pressure	Use a high-pressure hose to clean the sidewalls, roof, base, corners, and internal channels. Rotate and reposition the nozzle regularly.
7	Coalescing plates remain oily or blocked	Insufficient flushing between plate channels	Flush the plate pack from the front, rear, and above. Direct the spray downward through the vertical plates until all oil residue, sludge, and debris are removed.
8	Plate pack cannot be removed	Pack is jammed, incorrectly aligned, or has excessive sludge buildup	Do not force the pack. Carefully loosen surrounding buildup and attempt removal using the handles. Use the dedicated sludge-compartment access points on second-generation units, where provided.
9	Plate pack does not slide into position during reinstallation	Guide rails are incorrectly positioned relative to the pack, or the coalescing plate pack is bent or deformed	Ensure the separator guide rails locate inside the plate pack and its internal side panels sit outside the guide rails. Inspect the pack for deformation; do not force it into position. Replace it if it cannot be correctly seated.
10	Float valve (if fitted) does not rise after refilling	Float is contaminated, damaged, obstructed, or waterlogged	Remove the float from service and inspect it for damage, contamination, or obstruction. Clean or replace it before recommissioning the separator.
11	Effluent quality remains poor after separator cleaning	Clear-water chamber, outlet elbow, or baffle box was not cleaned; the separator was not refilled with clean water before recommissioning; or degreaser/surfactant is present in the wastewater, causing an oil-water emulsion	Inspect and clean the applicable final-chamber components. Refill the separator with clean water before recommissioning. Identify and control upstream use of degreasers or surfactants where possible.
12	Separator is returned to service with too little water	Unit was not refilled to the outlet-pipe invert level, or the tank is leaking	Refill with clean water to the outlet-pipe invert level. Inspect the tank, joints, and fittings for leakage and repair any defects before returning the separator to service.
13	Covers or internal components are loose after servicing	Nuts, bolts, or fasteners were not correctly tightened	Reinstall all components and inspection covers. Verify that all fasteners are secure before returning the separator to service.
14	Separator is overflowing	The separator has reached its oil-storage capacity and, where fitted, the automatic shut-off float valve has closed the outlet; sludge buildup, a damaged float, or a damaged/deformed float cage may prevent the float valve from moving freely; or the inlet chamber, clear-water chamber, outlet elbow, or baffle box is blocked with sludge and debris	Stop incoming flow and arrange for the separator to be emptied and cleaned. Inspect and clean all chambers, the outlet elbow, and baffle box. Where fitted, inspect the float valve and cage, remove sludge buildup, and replace damaged components. Automatic shut-off valves should only be used with suitable level sensors or alarms to alert operators before closure and prevent overflow.
15	Unpleasant odour is coming from the separator	Anaerobic decomposition in stagnant water beneath floating oil; accumulated sludge, grease, or solids; or chemical additives such as detergents, solvents, or volatile organic compounds (VOCs)	Empty and thoroughly clean the separator, including the sludge compartment, coalescing plates, and internal chambers. Remove accumulated oil, sludge, solids, and debris, then refill the separator with clean water before recommissioning.

END