

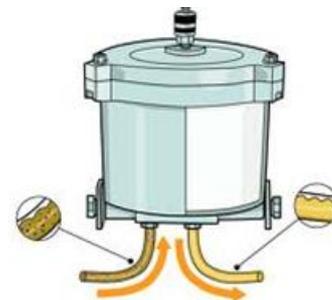


OIL FILTRATION SOLUTIONS FOR

BY PASS HYDRAULIC FILTER

Introduction

The Kleenoil Filtration system is installed in a bypass loop. The oil will be finely recycled and any water removed, as the equipment is operating. As a result of this process, the oil is maintained in a clean useable condition, dramatically changing any oil drain interval. The following procedures should be followed during installation of a Kleenoil Filtration unit to any hydraulic oil circuit or to a lubricating system as found in a diesel engine.



The Kleenoil Filtration Unit

The unit is supplied complete with the following items unless requested otherwise.

1. Cast aluminium casing, lid, lid sealing ring, lid bolts, nuts and washers.
2. Supporting bracket complete with four bolts, washers and two nuts.
3. Cartridge already installed in the unit ready for use.

Valve reduction package. Optional extra item for use on high pressure hydraulics.

Installation Procedure

1. Select a convenient place for locating the unit on the equipment.
2. Rigidly install the holding bracket.
3. Bolt the unit onto the holding bracket, preferably in a vertical position.
4. Select the appropriate oil pressure supply point on the engine or the hydraulic system.
5. Remove the existing plug and replace with an adaptor to suit your application.
6. Select the appropriate oil return point on the engine or the hydraulic system.
7. Remove the existing plug and replace with an adaptor to suit your application.
8. Measure for both the supply and the return lines.
9. Manufacture hose assemblies to suit
10. Connect each hose from the Kleenoil Filtration unit to the engine or hydraulic system.
11. Secure and protect hoses using plastic hose clips
12. Test run and check for any leaks.

BEFORE



Biodiesel



Diesel Fuel



Gear Oil

AFTER

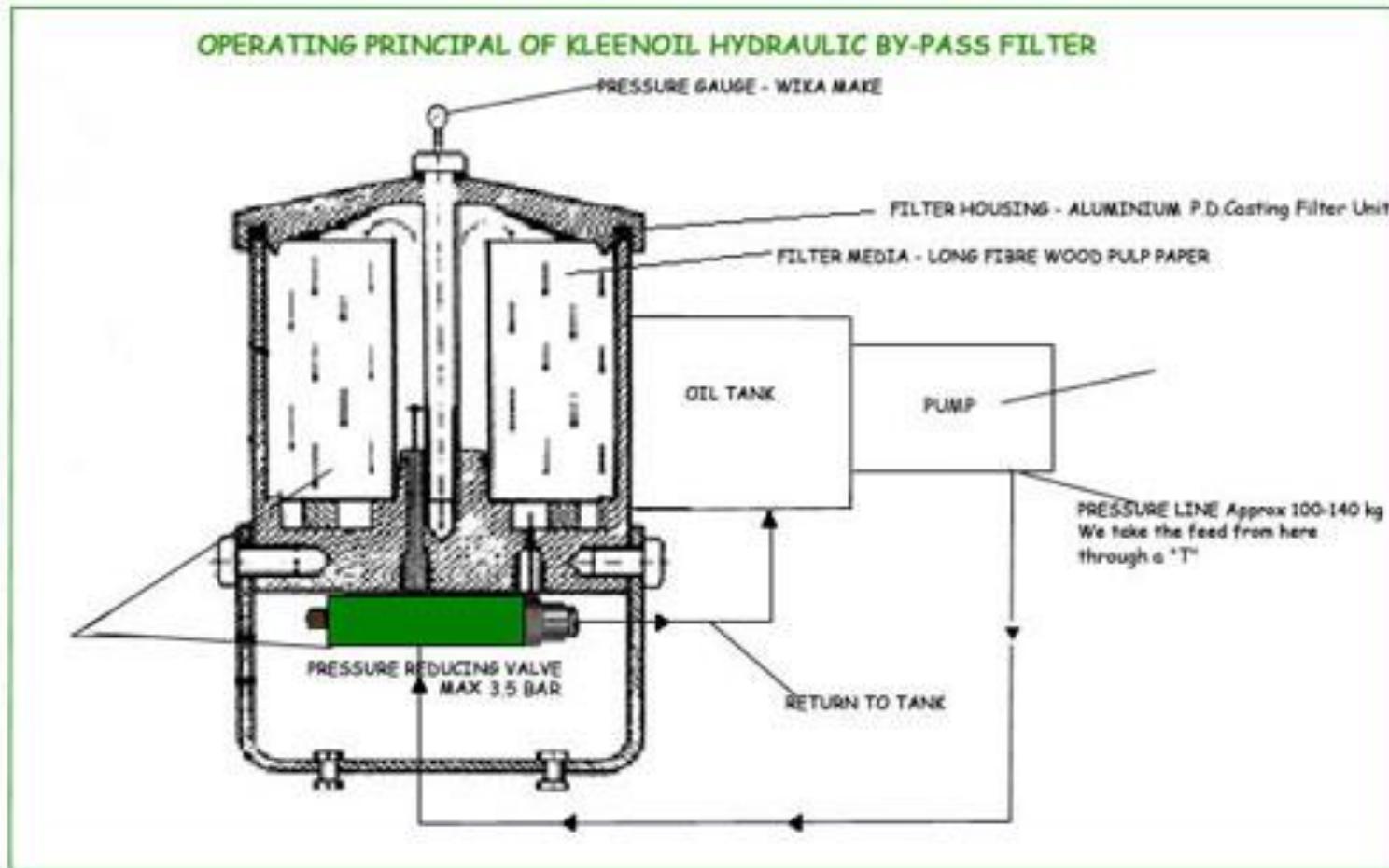


FA-ST Filtration Analysis Services Technology Ltd
Tel: +44 (0) 1246268900 E-Mail: info@fa-st.co.uk
Web: www.fa-st.co.uk www.oilsampling.co.uk
Co Reg Number: 05525184 Vat Reg Number: GB843 0628 38



OIL FILTRATION SOLUTIONS FOR

BY PASS HYDRAULIC FILTER





FA-ST Filtration Analysis Services Technology Ltd

OIL FILTRATION SOLUTIONS FOR INDUSTRY

BY PASS HYDRAULIC FILTER

FA-ST Ltd
 Unit 4 Foxwood Road Dunston
 Trading Estate Chesterfield
 Derbyshire S41 9RF
 T: +44(0) 1246 268900
 Fax +44(0) 1246 268904
www.fa-st.co.uk

The Kleenoil Hydraulic Block is mounted to the bottom of the Kleenoil Bypass Filtration System to convert the lower pressure bypass engine oil filter to a high pressure hydraulic fluid filter. There are three ports on the valve block as listed:

- Port 1: Low Pressure output approximately 50 PSI normally is blanked off but may be used to supply another filter housing fitted adaptor -4 (1/4") BSP
- Port 2: High pressure input up to 3000 PSI
- Port 3: Return to hydraulic reservoir. This port is fitted with adaptor -6 (3/8")BSP and it is important that the return hose is of at least 3/8" bore.

TECHNICAL SPECS:

| | SDU 9788 | HDU 9778 | LDU 9768 |
|--|-----------------|-----------------|-----------------|
| Fitted with Cartridge | 1888 | 1878 | 1868 |
| Suitable for tanks (single unit) | Up to 1360 ltrs | Up to 540 ltrs | Up to 120 ltrs |
| Water retention (down to <0.05%) | 1.2ltrs | 0.56ltrs | 0.32ltrs |
| Technical Specs | H 180 Dia 212mm | H 165 Dia 168mm | H 160 Dia 120mm |



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MAINTENANCE PROCEDURES FOR KLEENOIL FILTRATION UNITS

Introduction

With Kleenoil Filtration technology correctly installed on an engine, a hydraulic system or on a transmission, the oil will be finely recycled and the water removed during operation. This means the oil is maintained in a clean useable condition. As a result of this process, it is practical to extend the life of the oil dramatically, while at the same time giving the engine added protection against wear and corrosion. Equipment users are encouraged to carry out regular oil analysis as part of their good management practices. These analyses will indicate whether or not the oil is reusable.

Maintenance Procedures for Kleenoil Filtration units installed on diesel engines in heavy duty trucks and equipment

1. Take regular oil samples and obtain analysis reports for equipment management.
2. Change oil and full flow filters when the Kleenoil Filtration technology is installed.
3. Thereafter, change the Kleenoil Filtration cartridge **every 8,000 to 15000 miles (or 100 to 300 hours)**, or as instructed by your maintenance manager. (This is usually around the time you previously changed oil). **Do NOT change the oil. Do NOT change the full flow filters at this time.**
4. Change the oil and full flow filters as indicated by oil analysis or as directed by your maintenance manager. This will probably be in the region of 10 times longer than you previously experienced. **In many cases, it is practical to move to a 1 year oil and OEM filter change routine.** In any event, the OEM oil filter must be changed at least once each year. They will degrade if immersed in oil longer than 12 months.

Our Mission Is To Give Your Equipment The Finest Treatment

Maintenance Procedures for Kleenoil Filtration units installed on diesel and gas engines in light duty trucks

1. Take regular oil samples and obtain analysis reports for equipment management
2. Change oil and full flow filters when the Kleenoil Filtration technology is installed.
3. Thereafter, change the Kleenoil Filtration cartridge every **8,000 to 10000 miles** or as instructed by your maintenance manager. **Do NOT change the oil. Do NOT change the full flow filters at this time.**
4. Change the oil and full flow filters as indicated by oil analysis or as directed by your maintenance manager. This will probably be in the region of 10 times longer than you previously experienced. **In many cases, it is practical to move to a 1 year oil and OEM filter change routine.** In any event, the OEM oil filter must be changed at least once each year. They will degrade if immersed in oil longer than 12 months.
5. In the case of a gasoline or natural gas engine, it is probable that you will never need to change the oil again.



Maintenance Procedures for Kleenoil Filtration units installed on hydraulics

1. Take regular oil samples and obtain analysis reports for equipment management.
2. Change the Kleenoil Filtration cartridges every 400 to 600 hours or as instructed by your maintenance manager.
3. Change oil only when indicated by oil analysis.
4. Change standard filters according to OEM specifications.
5. Please note that the frequency of cartridge change varies according to the operating conditions.
6. It is highly likely that you may never change the hydraulic oil again.

Changing the Kleenoil Filtration Cartridge: (2 to 5 minutes)

1. Remove the lid with a wrench.
2. Wrap the new plastic cover over the lidless Kleenoil filtration unit.
3. With one finger through the plastic cover and the brass ring on the top of the cartridge, wiggle the cartridge to remove suction and pull out of the unit. Seal the plastic with the old cartridge inside ready for disposal.
4. Place the new cartridge in the unit with the brass ring uppermost.
5. Replace or return the lid sealing ring, place the lid in position, and tighten down with a wrench using between 24 and 28 lbs ft.
6. Run the engine for a few minutes until warm, and top up the oil level.
7. Users/mechanics should get used to touching the Kleenoil Filtration units on a regular basis. If the unit is warm or hot during normal operations, then it and the engine oil system are working well. If at any time during normal operations the unit is cold, then the unit is not working. Assuming that the proper maintenance has been carried out, this is a warning sign that something is wrong in the engine or with the oil feed to the unit.

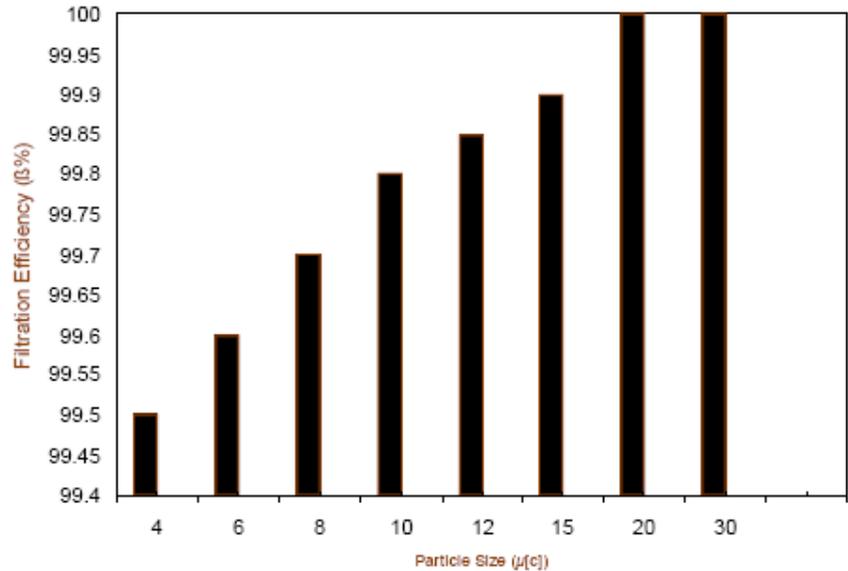
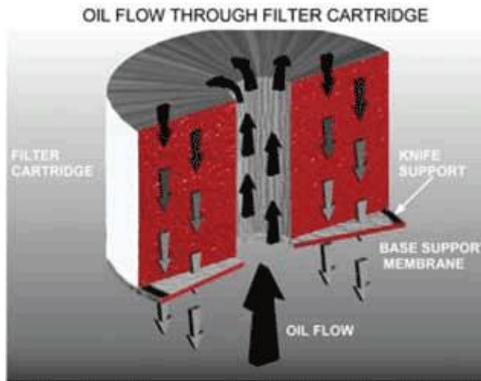
Notes:

1. If the oil samples indicate that too much contamination remains in the oil, then either the cartridge change interval should be reassessed or the size of the unit may not be adequate for the conditions involved.
2. If diesel fuel is leaking into the oil, the problem should be addressed at source. Usually leaking injectors. Continued leakage of diesel into the oil, will change the properties of the oil which will then require attention.
3. Diesel leakage through the Kleenoil Filtration cartridge can be detected by a grey colour (instead of black) on the top of a spent cartridge, together with the obvious smell of the diesel in the system.
4. In the event of any oil related OEM or Kleenoil Filtration warranty or other claim, a large (1 quart) oil sample must be jointly taken, labeled and signed by the user, by the OEM, and by Kleenoil Filtration immediately. The sample will then be divided into approximately three equal portions for the interested parties to have analysed.
5. Kleenoil Filtration has excellent in-house expertise regarding oil analysis interpretation. All Kleenoil Filtration customers can receive a free written interpretation of their oil analysis result where it relates to equipment using the technology.

All Kleenoil Filtration systems carry a lifetime warranty

KLEENOIL FILTER CARTRIDGE

Multipass Test Data



TEST DATA FOR KLEENOIL CARTRIDGES

Based on the multi-pass method for evaluating filtration performance according to ISO 16889 (1999). The results have been presented after 8 hours of operation. With the ability to remove water, the cartridge is designed to perform at below 4 micron absolute on a minimum of 5 passes.

Cartridge Description.

The KLEENOIL filter cartridge is a depth cartridge made of long fibre cellulose with a strengthened cellulose knife support ring. The filter is covered with a nylon outer cover. The cartridge can be used on all types of pure oil based products, synthetic and mineral.

Filtration is carried out on the off-line principle and on low pressure to provide the necessary filtration.

Pressures are controlled between 1 and 4 bar with 6 bar maximum.

Cartridge Disposal.

Used cartridges should be disposed of in accordance with local regulations and are made from fully combustible materials.

Operating Temperature

Cartridges will operate within the majority of applications at -10 to +120 Centigrade