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|---|--------------------|-----------------|---|---------------------------|
| Document Title:<br><b>Hydraulic description</b>         | system, <b>900</b> | Function Group: | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G930B, G940B, G946B, G960B [GB]</b> |                    |                 |   |                           |

## Hydraulic system, description

The main hydraulic system consists of several different components, which collectively make up a complete hydraulic system. For details on the included components, see the description for each component.

The main hydraulic system is a pressure and flow compensated (load sensing) system with a variable displacement axial type piston pump. A priority flow control valve ensures the steering system has priority over the implement circuit. Each work section of the ten bank directional flow valve has built in internal flow compensators. All sections of the ten bank directional flow valve have restricted motor spools. Thermal relief valves protect each circuit from pressure caused due to the thermal expansion of oil.

The hydraulic operated cooling fan circuit is fully independent of the main hydraulic system. It does however, use the same hydraulic oil tank and oil.

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|---|-------------------------------|---|---------------------------|
| Document Title:<br><b>Hydraulic oil, description</b>    | Function Group:<br><b>900</b> | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G930B, G940B, G946B, G960B [GB]</b> |                               |   |                           |

## Hydraulic oil, description

The machine is standard equipped with mineral-based hydraulic oil. Bio-degradable oil is available as an option.

The hydraulic oil contains selected additives which give good oxidation stability, corrosion protection and lubrication characteristics. The hydraulic oil has good compatibility with bearings containing lead alloys.

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|---|-------------------------------|---|---------------------------|
| Document Title:<br><b>Hydraulic oil, storing and handling</b> | Function Group:<br><b>900</b> | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G930B, G940B, G946B, G960B [GB]</b>       |                               |   |                           |

## **Hydraulic oil, storing and handling**

- Hydraulic oil should be stored in tightly sealed containers or barrels.
- Only containers approved for transporting hydraulic oil should be used for this purpose.
- Hydraulic oil should be stored indoors or in temperature controlled facilities. If hydraulic oil is stored outdoors, the barrels should be horizontal to prevent penetration of water and eradication of barrel markings.
- In order to avoid condensation, hydraulic oil should not be stored in temperatures above 60° C (140° F), or exposed to intense sunlight or cold temperatures.

|   |                               |   |                           |
|---|-------------------------------|---|---------------------------|
| Document Title:<br><b>Hydraulic components,<br/>storage and transport</b> | Function Group:<br><b>900</b> | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G930B, G940B, G946B, G960B [GB]</b>                   |                               |   |                           |

## **Hydraulic components, storage and transport**

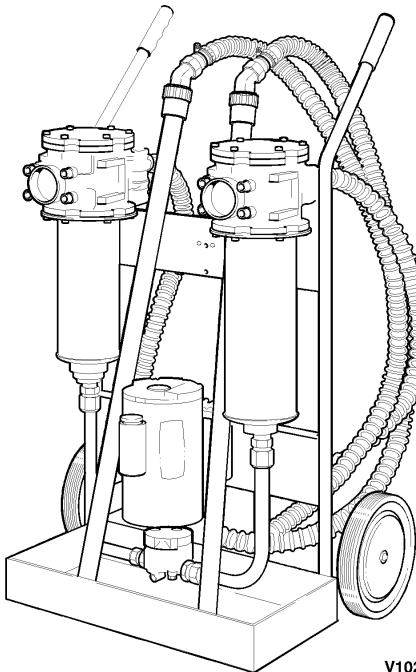
- All hydraulic components should be stored in plastic bags. They should also be plugged. The packaging must not be opened until the component is to be used.
- Service vehicles should be equipped with an interior which facilitates good order and cleanliness.
- Each service vehicle should have a roll of plastic sheeting, plastic plugs of the most common dimensions and plastic containers for components. Plugs and plastic sheeting should be of the disposable type; that is, for one time use only.

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| Document Title:<br><b>Oil and filtration</b> | Function Group:<br><b>900</b> | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G960B [GB]</b>           |                               |   |                           |

## Oil and filtration

The main function of the oil in the hydraulic system is to transfer energy from the engine driven hydraulic pumps to the various hydraulic actuators (cylinders and motors). It must also lubricate the moving parts in the hydraulic components, protect them against corrosion and transport all dirt particles and heat out of the hydraulic system. It is therefore, important to choose the correct oil with the correct additives and properties to suit the machine's operating parameters. Refer to the **OPERATOR'S MANUAL** for the proper selection of the systems hydraulic oil. Effective filtration is the most important precondition in ensuring that the hydraulic system performs reliably and has a long working life. The oil in the hydraulic system must be maintained to a minimum cleanliness level of 18/13 as per ISO standard 4406 standard at all times.

In the event of a major component failure, the oil in the system will be contaminated and must be cleaned using an external filtration system such as a filter cart. Volvo strongly recommends scheduled oil sampling of the systems hydraulic oil as part of a preventative maintenance procedure.



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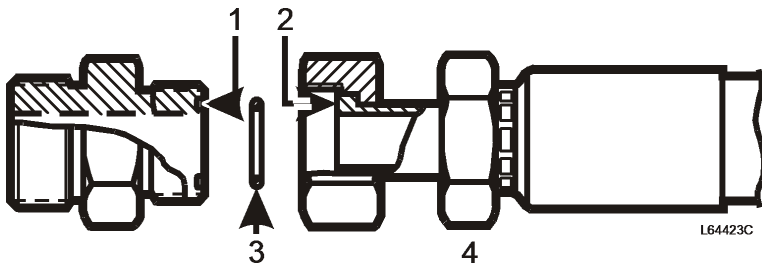
**Figure 1**  
**Commercial filter cart**

Biodegradable oil conforming to ISO 46 specifications are suited for use on G900 series machines. Refer to special instructions for converting the machine from mineral oil to biodegradable oil.

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|--|--|---|---------------------------|
| Document Title:<br><b>Hydraulic couplings, description</b> | Function Group:<br><b>couplings, 911</b> | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G930B, G940B, G946B, G960B [GB]</b>    |  |   |                           |

## Hydraulic couplings, description

All hydraulic couplings are of the ORFS (O-ring Face Seal Connection) type. When installing these couplings, it is very important that the correct size O-ring is used and that the O-ring is lubricated. During the tightening, the hose coupling must be held in position, so that it does not turn. In case of a leak, the O-ring must be replaced.



**Figure 1**

Hydraulic coupling of ORFS type

1. Groove for O-ring
2. Flat sealing surface
3. O-ring
4. Coupling

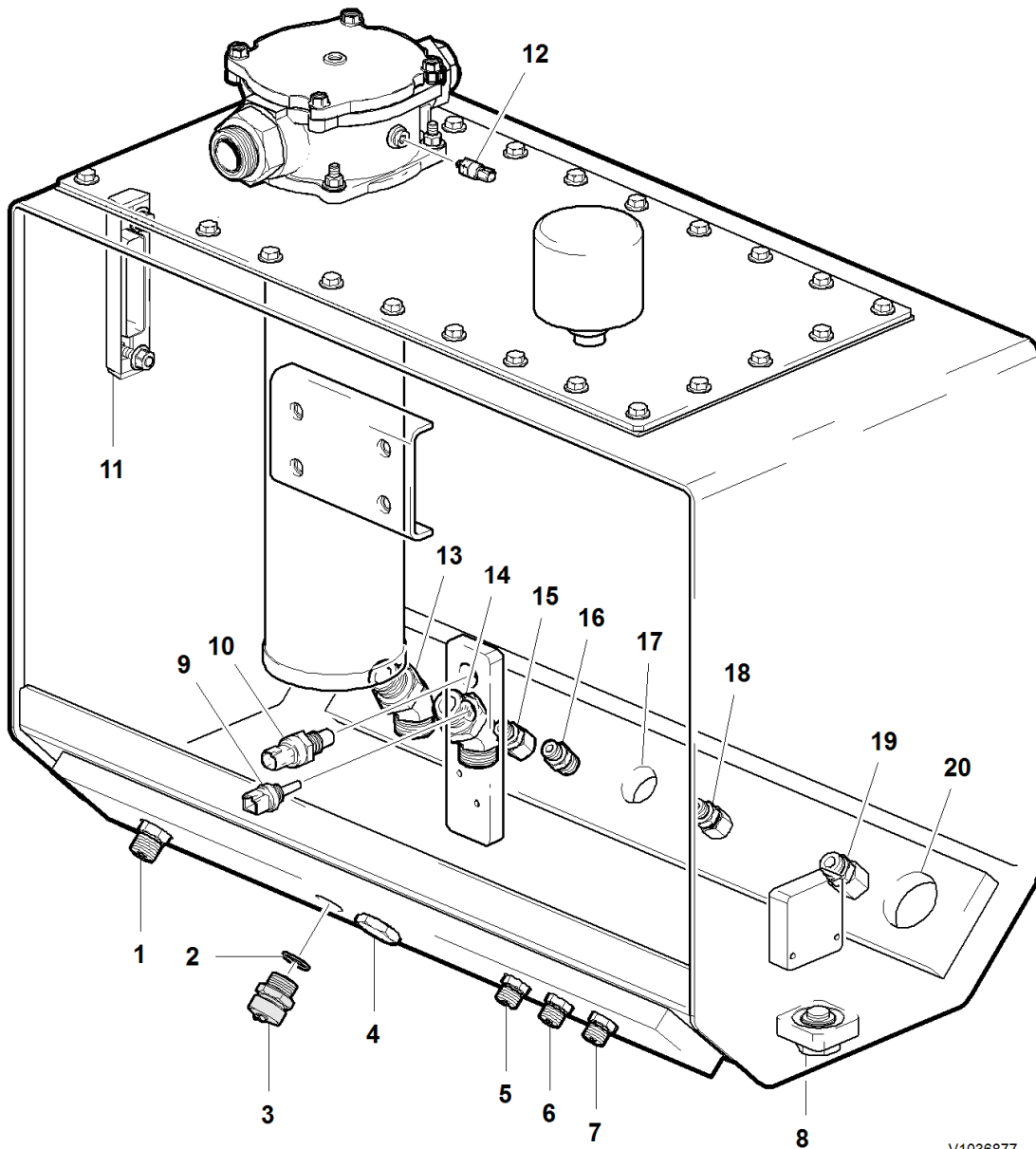
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|--|-------------------------------|---|---------------------------|
| Document Title:<br><b>Hydraulic oil tank -<br/>description and operation</b> | Function Group:<br><b>911</b> | Information Type:<br><b>Service Information</b> | Date:<br><b>2015/2/10</b> |
| Profile:<br><b>GRD, G930B, G940B, G960B [GB]</b>                             |                               |   |                           |

## **Hydraulic oil tank - description and operation**

The hydraulic oil tank is filled through the return oil filter. A quick disconnect filler arrangement is available as an option and is highly recommended upon filling in order to avoid contaminants from entering the hydraulic system. A quick disconnect drain plug at the bottom of the hydraulic oil tank facilitates easy draining of the hydraulic oil.

The hydraulic oil tank is not pressurized and is open to atmosphere via a check valve and filtered breather. The maintenance interval is 2000 hours for the hydraulic oil tank filter and breather.

The hydraulic oil tank supplies oil to the implement, steering, cooling fan and All Wheel Drive systems. The return oil filter for the implement circuits, cooling fan and steering system is housed inside the hydraulic oil tank. The return oil filter has a bypass valve. If the return oil filter becomes clogged with debris, the bypass valve will open at 0.17 MPa (1.7 bar, 25 psi) and will let unfiltered oil return to the hydraulic oil tank. Regular maintenance must be performed on the return oil filter element to prevent filter bypass and ensure proper filtration of the systems hydraulic oil.



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**Figure 1**

1. Fan pump drain
2. Copper washer
3. Drain valve
4. Plug for optional heater
5. Front auxiliary drain
6. Priority flow valve drain — T port
7. Load sense line relief valve drain (port 2)
8. Magnetic plug
9. Oil temperature sensor
10. Oil level switch
11. Oil level inspection glass
12. Pressure sensor
13. Steering and implement pump drain
14. Fan valve return — T port
15. Rear auxiliary drain
16. Fan motor drain line
17. Fan pump suction
18. Secondary steering return line



19. Secondary steering suction line
20. Steering and implement pump suction

### **Hydraulic oil tank heating elements**

In very cold ambient temperatures, the hydraulic oil must be preheated using an external source of energy before the machine is started. The hydraulic oil tank has provisions for the installation of 110 volt and 220 volt heating elements (optional).

For information regarding the All Wheel Drive system hydraulic oil tank, refer to [440 All Wheel Drive hydraulic tank, description and operation](#).

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