

Section G2m

Special precautions

Important

Hydraulic system mineral oil must be used in the hydraulic systems of cars with serial numbers from 50 001

Under no circumstances should a conventional synthetic brake fluid be substituted for the genuine hydraulic system mineral oil.

Before attempting any work on the hydraulic systems of the car, service personnel must note carefully the contents of this section and be fully conversant with the precautions required to ensure adequate safety and correct system operation.

The hydraulic systems operate at high pressure

Pipes and components must never be removed when the hydraulic systems are in a charged state.

Before any work, except specified test, is carried out on the hydraulic systems, depressurisation of the systems must be carried out.

All hydraulic system equipment should carry identification to show the type of system for which it may be used i.e. RR 363 Brake Fluid (colour reference yellow) for cars with serial numbers prior to 50 000 or Hydraulic system mineral oil (colour reference green) for cars with serial numbers from 50 001 onwards.

To assist in the identification marking of mineral oil components and equipment, self adhesive labels bearing the logo as shown in Figure G4m are available from the Parts Department at Crewe.

Hydraulic system mineral oil

Hydraulic system mineral oil is **Green** in colour. It is essential that only approved hydraulic system mineral oil is used (see Chapter D - Lubricants). Contamination of mineral oil hydraulic systems or components with any conventional vegetable or synthetic type of brake fluid will cause seals and hoses to deteriorate which could result in eventual brake faults.

To avoid contamination all mineral oil containers and components should be stored in a clearly defined area away from that used for conventional brake fluid.

Hydraulic system mineral oil can cause damage to tyres. In the event of mineral oil coming into contact with a tyre, damage can be prevented if the mineral oil is removed immediately using a soap solution. Finally wash the tyre with clean water.

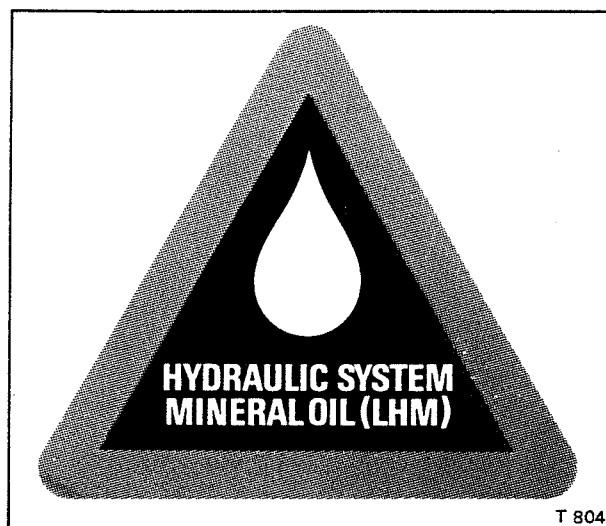


Fig. G4m Hydraulic system mineral oil logo

Component identification

All components which are susceptible to damage from brake fluids are colour coded **Green** and have **GMF** prefix part numbers e.g. GMF 1062.

Other components in the system which are not susceptible to brake fluid damage (i.e. metal pipes and connectors) are neither colour coded nor do they have a GMF prefix part number. It must be stressed however that these parts must not become contaminated with brake fluid as this could circulate to other components in the hydraulic systems.

For details of individual component identification reference should be made to the relevant component section in this chapter.

Cleanliness

For the correct functioning of the hydraulic system meticulous care should be taken to ensure complete cleanliness at all times.

Since both the braking system and height control system, have components with very fine manufacturing tolerances, the ingress of even very small particles of foreign matter could have very serious effects on the operation of the systems.

Care must be taken to ensure that at all times, only clean hydraulic system mineral oil is used in the system and that any overhauled units or components are not exposed to contamination during assembly or fitting.

G2m - 2

Contact with conventional brake fluids must be avoided at all times as these fluids have a detrimental effect on the rubber seals and hoses used in hydraulic mineral oil systems.

Depressurising the system**Method 1**

Switch on the ignition and pump the brake pedal 50 to 60 times until the facia warning panels marked 1 BRAKE PRESSURE and 2 BRAKE PRESSURE are illuminated. Switch off the ignition.

To depressurise the rear suspension strut place a bleed tube to each strut bleed screw in turn. Open the bleed screw and allow the hydraulic system mineral oil to bleed into a clean container until the flow ceases.

Method 2

Open the bleed screw on both accumulators and allow sufficient time for the mineral oil pressure to discharge back to the reservoir. These bleed screws are in integral part of the accumulator, the mineral oil being allowed to flow from the accumulator sphere back to the reservoir when the bleed screw is opened (see Fig. G13m). Switch on the ignition and check that the facia warning panels marked 1 BRAKE PRESSURE and 2 BRAKE PRESSURE are illuminated.

Depressurise the rear suspension struts as described in Method 1.

Accumulator and Gas spring spheres

The accumulator and gas spring spheres are charged on one side of their diaphragms with nitrogen gas to a pressure of between 60 to 64 bars (870lb/sq.in. to 928lb/sq.in.) and 14 to 16 bars (203lb/sq.in. to 232lb/sq.in.) respectively prior to despatch from the factory.

Each sphere is marked with a band of white paint or a stick on yellow label when charged. The charge pressure in bars is stamped on the non-return valve cap at the end of the sphere.

A date of manufacture is also marked on each sphere. It is recommended that spheres are stored and issued from stock in date sequence.

Bleeding the hydraulic systems

It is recommended that the gear change thermal cut-out is removed from the fuseboard situated beneath the facia, to isolate the electric gear change whilst the systems are bled.

Only use hydraulic system mineral oil bleed equipment when bleeding the hydraulic systems. **Never connect equipment that has been used for conventional brake fluids to the system.**

The bleed screws for the accumulators are an integral part of the accumulator valve housing and bleed hose connection is not required.

Reference should be made to Section G4m. for details of the complete bleeding procedure.

When bleeding the hydraulic system, any hydraulic system mineral oil that has been spilt onto

the tyres must be removed. The use of a soap solution and a final rinse with clean water is recommended for this purpose.

Under no circumstances should hydraulic system mineral oil be allowed to remain on the tyres for prolonged periods as this will cause tyre damage.

Removing components

Prior to disconnecting any pipes or removing hydraulic components from the car, the area around the pipes and components should be thoroughly cleaned. Particular attention should be given to the localised areas around the pipe unions and their corresponding ports.

Whenever units, pipes or components are disconnected from the hydraulic systems all open ports and pipe ends must be blanked off immediately, to avoid contamination of the system.

It is stressed that the clean condition of any blanks used is equally as important as the clean condition of the components they seal.

Blanks which have been used on cars with conventional brake fluid systems should not be used, unless they have been thoroughly cleaned and all traces of brake fluid removed.

Note

Masking tape and/or cork bungs do not constitute blanks.

Quantities of blanks may be obtained, on request, from the Parts Department at Crewe.

In addition, special pressure blanks are available, capable of withstanding full hydraulic system pressure. These blanks should be used during testing and fault diagnosis procedures where it may be necessary to blank off a pipe or component and then charge the systems. When fitted these blanks must be torque tightened to the figures quoted for the pipe unions which they replace.

Cleaning components

Methylated spirit is the only recommended cleaner.

Components which have been removed should be thoroughly cleaned before replacement.

Rubber pipes, sealing rings and other components should be washed in methylated spirit and then dried with dry compressed air.

Note

When rubber seals are washed in methylated spirits, they must not be allowed to soak, as prolonged immersion could have a detrimental effect.

Metal pipes requiring the removal of underseal and road dirt from their outer surfaces, may be cleaned with trichlorethylene or paraffin. In such cases, a final cleaning procedure and flushing of the pipe internal bore using methylated spirit should be carried out. Blow dry with clean compressed air.

Cloths even the lint free types, should never be used to clean hydraulic components.

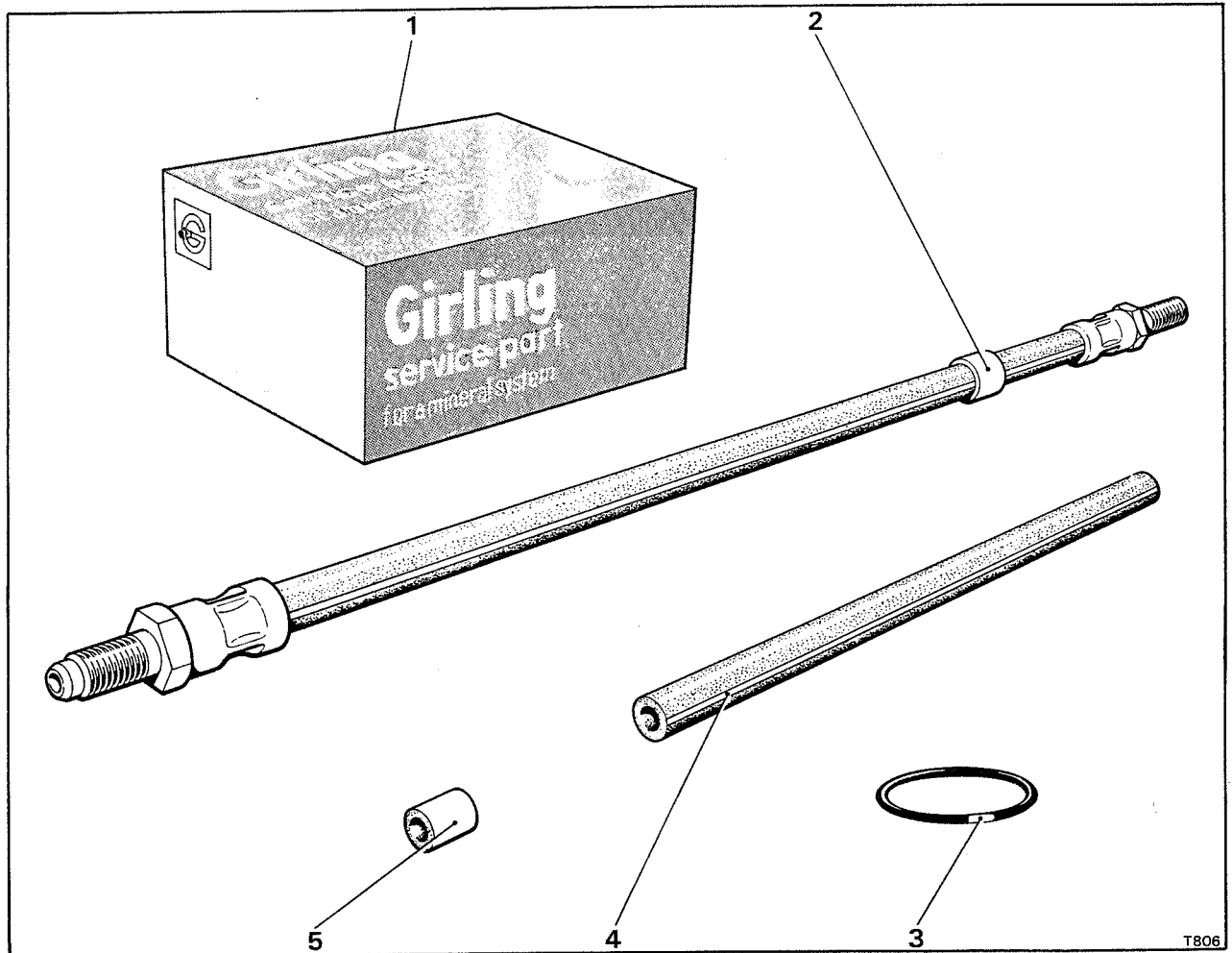


Fig. G5m Hydraulic system mineral oil component identification

- | | |
|--|-----------------------------------|
| 1 Brake seal kit container | 3 Sealing ring (green paint mark) |
| 2 Flexible brake hose (green collar and strip) | 4 Brake hose (green strip) |
| | 5 Pipe seal (green outer surface) |

Service equipment

All service equipment should be clearly marked to indicate the type of hydraulic system for which it is suitable.

Under no circumstances should equipment used for conventional brake fluids be used on a mineral oil hydraulic system or component.

Only pressure gauges, test and bleed equipment bearing hydraulic system mineral oil identifications should be connected to a mineral oil system.

Hydraulic system - General maintenance

When the hydraulic reservoir and systems are drained completely always fill with fresh clean hydraulic system mineral oil of the specified type. Refer to Chapter D for the correct specification.

After filling the systems, bleed as described in Section G4m.

Servicing rubber components

In the interest of safety, the rubber components used in the hydraulic systems have been allotted specific 'life' mileages at the completion of which or at the nearest service prior to completion it is recommended that the components are renewed. Reference should be made to Service Schedule Manual publication number T.S.D.4117 for this information.

Only rubber components bearing mineral oil identification marks should be fitted to a mineral oil hydraulic system.

Under no circumstances must a rubber component for a conventional brake fluid system be substituted for the correct component.

Fitting replacement units

Replacement hydraulic units are tested and blanked

G2m - 4

off before being despatched from the factory.

It is advisable, when fitting a replacement unit, that when the unit has been placed in position and the blanks removed, the mineral oil in the unit is allowed to drain before the pipes are connected.

When drained, the pipes should be connected and the appropriate bleeding operations carried out.

Note

The mineral oil should not be blown out, allowing it to drain is sufficient.

Storage and transportation

The care taken to prevent contamination of components during storage or transportation is extremely important.

All mineral oil components should be stored in a separate and clearly defined area from that used for conventional brake fluid components.

Replacement parts, pipes and units must be clearly identified and securely sealed with the correct blanks. Blanks should not be removed until immediately prior to fitting; the replacement parts must also be protected from dust and damage.

Sealing rings and rubber pipes in storage should be protected from dust, light and heat in order to reduce deterioration of the rubber.

Where mineral oil components are transported or returned to the manufacturer they should be clearly marked as being for use on mineral oil hydraulic systems.