Section G3

Hydraulic system pipework

Except in certain cases where flexible hoses are used to accomodate movement between two units the fluid for the systems is carried in bundy tubing.

The pipework, with the exception of the flexible hoses, is almost entirely 4,76 mm. (0.186 in.) diameter bundy tubing. The only exceptions are the ends of the return pipes from the hydraulic accumulators to the reservoir which are 6,35 mm. (0.250 in.) diameter. The metal sections of the feed pipes from the reservoir to the hydraulic pumps and the pressure feed pipe from the hydraulic pump to the accumulator are 9,52 mm. (0.375 in.) diameter.

To enable pipe identification neoprene sleeves are fitted to each end of the metal pipes, except for the short bridge pipe fitted to each rear caliper. A chart quoting the pipe colours and functions is given on Page G3 - 2. This chart should be consulted to determine the function of each pipe i.e. high pressure, low pressure and system.

Generally, pipework connections are effected by flared pipe ends and unions, either male or female as necessary. Conical seats are machined in the components or junctions to seat the flares and provide effective joints. In certain flexible pipe joints face seals and copper washers are employed.

If hydraulic pipes are disturbed the following points should be noted.

The area around the pipe union and pipe end should be thoroughly cleaned before the union is unscrewed.

Pipe ends should always be blanked off immediately after removal and the blanks should not be removed until immediately before fitting.

Whenever pipes are removed, the flares should be inspected for serviceability and pipes showing signs of damage, cracking or collapse must be renewed.

Before fitting, pipes and unions should be cleaned thoroughly using methylated spirits, then blown through with clean dry compressed air. Particular attention should be paid to the union and the exterior of the pipe immediately behind the flare.

When fitting pipes, do not overtighten unions as this could cause damage to pipe flares. In the case of face seals new copper washers must be fitted each time a pipe is refitted.

If when a pipe is removed the coloured sleeves are in poor condition they should be renewed. This is best achieved by expanding a new correctly coloured, rubber sleeve sufficiently to clear the union using a small three pronged expanding hand tool (e.g. Penguin pliers).

Identification sleeves are not fitted to the flexible hoses but the sleeves on the connecting pipes at either end may be used to identify the flexible pipe and its function.

The flexible and metal pipes can be readily identified by means of the colour coding and component location layout (see Figs. G1 and G2) and the function chart shown on Page G3 - 2.

Note

The two high pressure pipes from the hydraulic pumps to the hydraulic accumulators and the feeds from the reservoir to the hydraulic pumps are not marked and do not connect to any other marked pipes. Since these pipes are the only ones without means of identification confusion should not arise.

Extreme caution should be taken when fitting or renewing flexible pipes to ensure that the correct type of pipe is fitted, in the correct place and in accordance with the colour coding.

In the interest of safety, the flexible pipes fitted to the hydraulic systems have been allotted specific 'life' mileages at the completion of which or at the Service nearest to this mileage it is recommended that the flexible pipes are renewed.

For recommended 'life' mileages reference should be made to the Service Schedule Manual publication number T.S.D. 4117.

When removing ridged or flexible pipes, the positions of all clipping points and pipe routing should be noted to ensure that, when fitted, no chafing or vibration of the pipes can occur. Always ensure that the flexible hoses and ridged pipes are routed to clear other components and that clearance is maintained during the full range of steering and suspension movement.

It should be noted that the 4,76 mm. (0.186 in.) diameter pipes are not available as spares and in the event of a replacement being required it is recommended that they are produced using 'Armco' 25 microns zinc plated, fully chromate passivated bundy tubing. Care should be taken to avoid sharp bends when producing replacement pipes as this will cause the plating to fracture.

Note

The pipe connection tappings on the front wheel calipers are metric threads and only unions of the correct thread should be fitted to the caliper end of the pipes.

All pipes must be thoroughly cleaned using methylated spirit and dried using clean compressed

air. The ends should then be blanked until immediately before fitting.

All replacement pipes should be protected with a coating of underseal after fitting and leak checks have been carried out.

Non-standard torque figures are specified for certain pipe unions and fittings. These figures are given in Chapter P which also quotes all standard and non-standard torque figures. These figures must be adhered to at all times to avoid overtightening and possible damage.

Pipework colour coding

Colour	Function	System and location
Red	High pressure	**No.1 Braking system,** pipes from the front hydraulic pump to the right-hand accumulator and from the right-hand accumulator to the upper brake distribution valve.
Orange	High pressure	**No.2 Braking and height control system,** pipes from the rear hydraulic pump to the left-hand accumulator and from the left-hand accumulator to the lower distribution valve. Also from the left-hand accumulator to the height control solenoid valve and the height control valves.
Black	Low pressure	**No.1 Braking system,** return pipe from the upper brake distribution valve to the fluid reservoir.
White	Low pressure	**No.2 Braking and height control system,** return pipes from the lower brake distribution valve to the fluid reservoir; return from the height control valves to the reservoir. Also the height control solenoid to the reservoir.
Blue	High pressure	**No.1 Braking system,** pipes from the upper brake distribution valve to the front calipers on the front wheels and the upper cylinders on the rear wheel calipers.
Mauve	High pressure	**No.2 Braking and height control system,** pipes from the lower brake distribution valve to the rear calipers on the front wheels and the lower cylinder on the rear wheel calipers.
Yellow	High pressure	**No.2 Braking and height control system,** pipes carrying signal pressure from the solenoid valve to the height control valves.
Brown	High pressure	**No.2 Braking and height control system,** pipes from the height control valves to the height control rams.
Pink	High pressure	**No.2 Braking and height control system,** pipes from height control rams to remote bleed screws on the body sill adjacent to the right-hand rear wheel.