

b) **Anti-freeze**

see Job No. 0-7, Measures for Winter Operation.

B. Cleaning Cooling System

After a longer period of operation or if the temperature of the cooling water gradually rises above the normal level, the cooling system has to be cleaned, degreased, and defurred. Especially important is the external cleaning of the radiator if it had been exposed to dusty air.

a) **Cleaning of radiator (external)**

Normally it is sufficient to clean the radiator with compressed air and/or wash it with a spray applied from the engine side, thus thoroughly removing foreign matter from the gills. This operation has to be executed regularly depending on the prevailing dust and/or the rate of contamination.

If an adequate cleaning can not be accomplished the radiator must be removed, washed with a 2 % solution of soda, P 3, or Imi, and thoroughly flushed afterwards.

b) **Degreasing of the radiator (internal)**

Add 200 g of soda lye, P 3, or Imi to approx. 10 lit. water. Operate the engine with this solution for one day, then drain cooling water with solvent, and thoroughly flush the cooling system with a flow of fresh cooling water while the engine is in operation. Then fill in refined cooling water as specified.

c) **Defurring of the cooling system (internal)**

The practical method of defurring is the treatment with hydrochromium. The operating instructions for this compound must be closely followed, but in addition it has to be taken into consideration that hydrochromium and anti-freeze should not be used together.

Depending on the amount of fur deposit 5 to 10 % solvent has to be added to the cooling water in doses of approximately $\frac{1}{2}$ lit. but only while the engine is in operation. After a longer run, but not later than one day, a test strip supplied by the producer has to be dipped shortly into the cooling water. With the help of a color scale also supplied together with test instructions the pH-value of the cooling water can be determined by comparing the color of the used test strip. Is the pH-value higher than 6, drain cooling water, flush cooling system thoroughly, and repeat the procedure. The cleaning is completed if the pH-value stays below 6 after a longer period of operation. Then drain cooling water again, flush cooling system thoroughly, and fill in refined cooling water as specified.

After the performance of the operations described under b) and c) the cooling water level has to be checked repeatedly, because the deposits removed might have sealed off an already existing leak.

Assemblies equipped with water recooling system have heat exchangers which should be cleaned in a similar way as described above.