Lubrication methods

Objective: At the end of this lesson you shall be able to
- **state the systems of lubrication and their application**

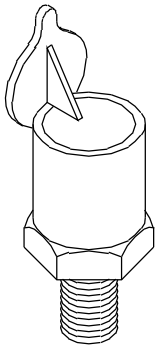
There are 3 systems of lubrication.

- Gravity feed system
- Force feed system
- Splash feed system

Gravity feed

The gravity feed principle is employed in oil holes, oil cups and wick feed lubricators provided on the machines. (Figs 1 & 2)

Fig 1



OIL CUP

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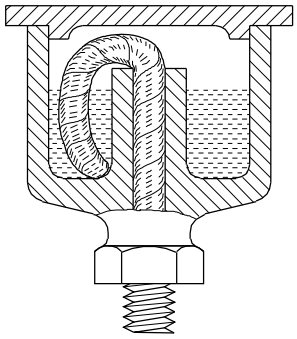
Fig 2



WICK FEED

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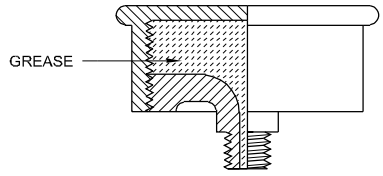
Force feed/Pressure feed

Oil, grease gun and grease cups

The oil hole or grease point leading to each bearing is fitted with a nipple, and by pressing the nose of the gun against this, the lubricant is forced to the bearing. Greases are also force fed using grease cup. (Fig 3)

Oil is also pressure fed by hand pump and a charge of oil is delivered to each bearing at intervals once or twice a day by operating a lever provided with some machines. (Fig 4) This is also known as shot lubricator.

Fig 3



MANUAL SCREW DOWN GREASER

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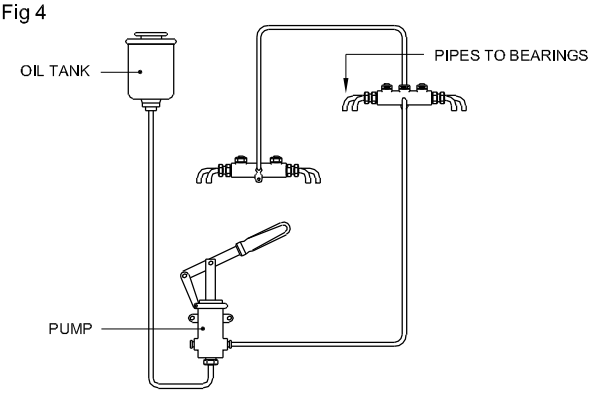
Fig 4



HAND PRESSURE FEED (SHOT LUBRICATED)

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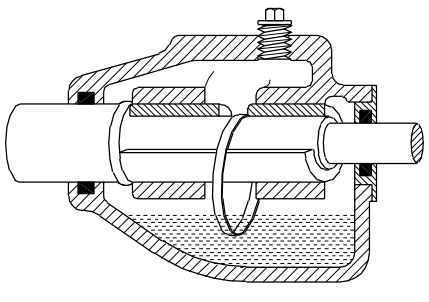
Oil pump method

In this method an oil pump driven by the machine delivers oil to the bearings continuously, and the oil afterwards drains from the bearings to a sump from which it is drawn by the pump again for lubrication.

Splash lubrication

In this method a ring oiler is attached to the shaft and it dips into the oil and a stream of lubricant continuously splashes around the parts, as the shaft rotates. The rotation of the shaft causes the ring to turn and the oil adhering to it is brought up and fed into the bearing, and the oil is then led back into the reservoir. (Fig 5) This is also known as ring oiling.

Fig 5



RING OILING

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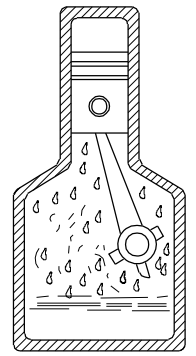
In other systems one of the rotating elements comes in contact with that of the oil level and splash the whole system with lubricating oil while working. (Fig 6) Such systems can be found in the headstock of a lathe machine and oil engine cylinder.

Fig 6



SPLASH-LUBRICATING SYSTEM

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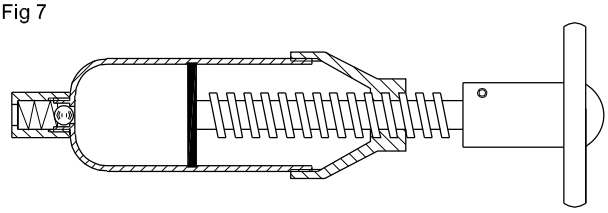
Types of grease guns

The following types of grease guns are used for lubricating machines.

- 'T' handle pressure gun (Fig 7)

Fig 7



T-HANDLE PRESSURE GUN

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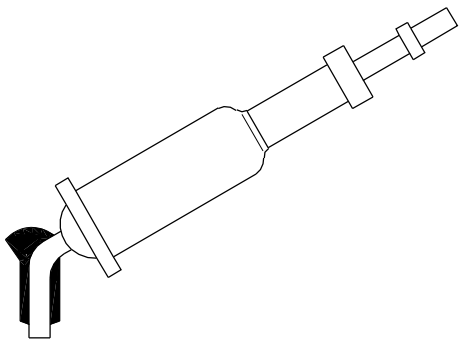
- Automatic and hydraulic type pressure gun (Fig 8)

Fig 8



AUTOMATIC HYDRAULIC-TYPE PRESSURE GUN

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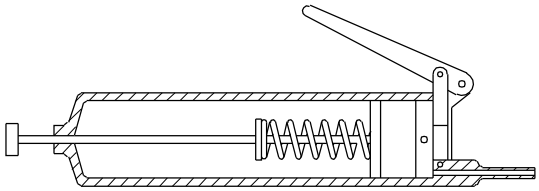
- Lever-type pressure gun (Fig 9)

Lubrication to exposed slideways

The moving parts experience some kind of resistance even when the surface of the parts seems to be very smooth.

Fig 9



PRESSURE GREASE GUN

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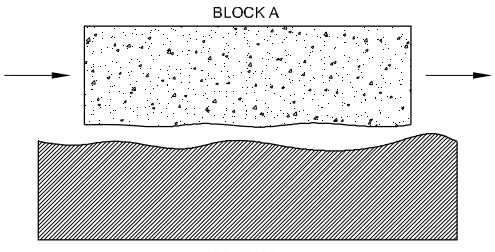
The resistance is caused by irregularities which cannot be detected by the naked eyes.

Without a lubricant the irregularities grip each other as shown in the diagram. (Fig 10)

Fig 10



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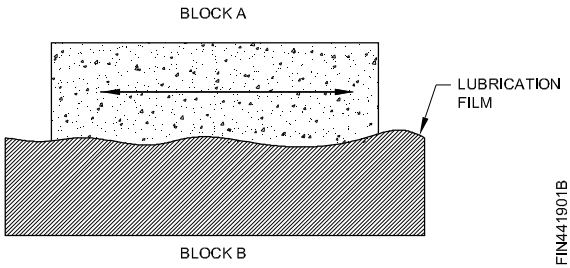
With a lubricant the gap between the irregularities fills up and a film of lubricant is formed in between the mating components which eases the movement. (Fig 11)

Fig 11



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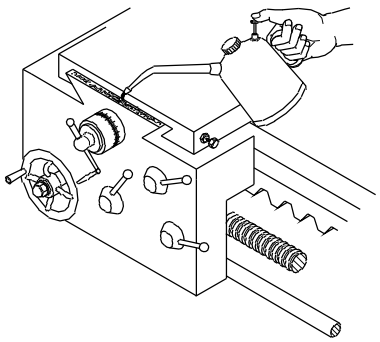
The slideways are lubricated frequently by an oilcan. (Fig 12)

Fig 12



OIL THE SLIDES FREQUENTLY

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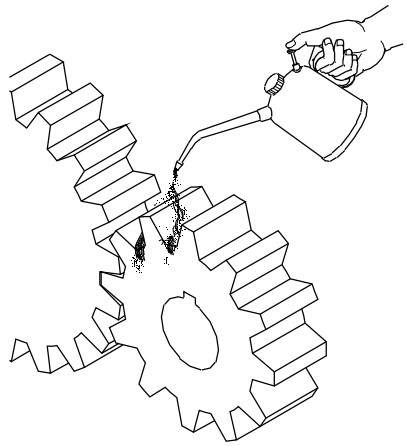
After cleaning the open gears, oil them and repeat lubrication regularly. (Fig 13)

Fig 13



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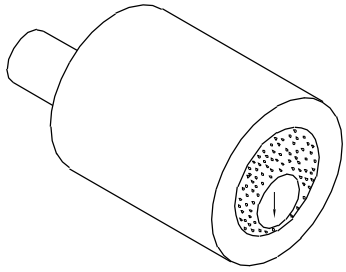
Lubricate bearings

A shaft moving in a bearing is also subjected to frictional resistance. The shaft rotates in a bush bearing or in ball/ roller bearing, experiencing friction.

When the shaft is at rest on the bottom of the bush bearing, there is hardly any lubricant between the shaft and the bush. (Fig 14)

Fig 14



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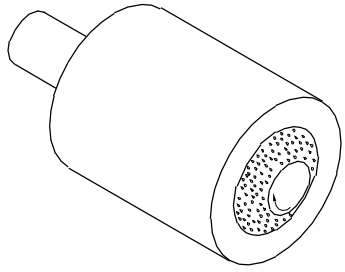
When the shaft starts rotating the lubricant maintains a film between the shaft and the bush and an uneven ring of lubricant builds up. (Fig 15)

Fig 15



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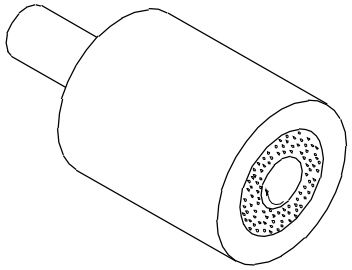
When the shaft is rotating at full speed a full ring of lubricating film surrounds the shaft (Fig 16) which is known as hydro dynamic lubrication.

This lubrication ring decreases the frictional resistance very much and at the same time protects the mating members against wear and changes.

Fig 16



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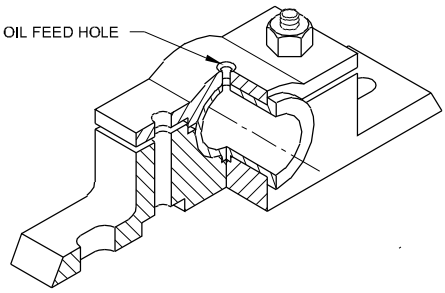
Some bush bearings have oil feeding holes over which the oil or grease cup is mounted and the lubricant is fed through the holes into the bearing by gravity feed system.(Fig 17)

Fig 17



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Hints for lurbicating machines:

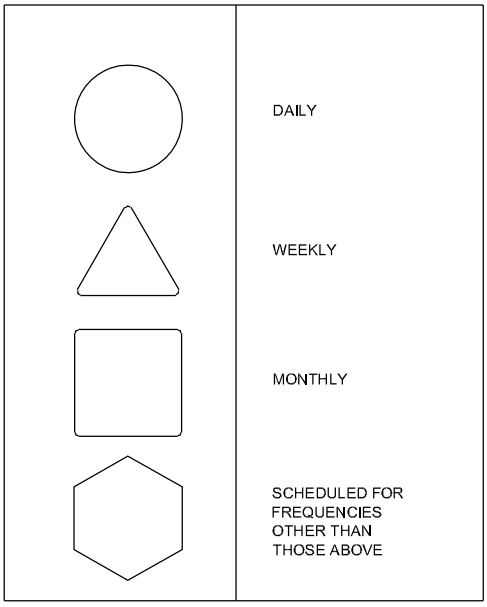
- identify the oiling and greasing points
- select the right lubricants and lubricating devices
- apply the lubricants.

The manufacturer's manual contains all the necessary details for lubrication of parts in machine tools. Lubricants are to be applied daily, weekly, monthly or at regular intervals at different points or parts as stipulated in the manufacturer's manual.

These places are indicated in the maintenance manuals with symbols as shown in Fig 18.

Fig 18

FREQUENCY CLASSIFICATION SYMBOLS



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