DIESEL MECHANIC

MINING QUALIFICATIONS AUTHORITY

CODE: LUB-2

PACK A PLUMBER BLOCK

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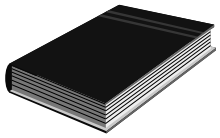
INDEX

The following elements are contained in this learning guide:



SOURCE REFERENCES

Demonstration by a competent person e.g. a Training Officer.

Audio-visual aids.

OBJECTIVE

You will be learning towards the outcome “Pack a plumber block”. Whilst learning towards the outcome you will be required to achieve the following:

- Familiarise yourself with grease lubrication.
- Pack a plumber block correctly with grease.

On completion of this module, the learner must be able to:

- Explain the three methods of grease lubrication.
- Correctly pack a plumber block with grease.

During this process you must adhere to certain specified requirements as listed in the Module.

ASSESSMENT AND EVALUATION CRITERIA

You will be assessed, when you are confident that you may achieve the outcomes as listed, to determine your competence as measured against the required criteria. This assessment will be in line with accepted best practices regarding assessment.

- A practical test will be set at the end of the module and must be completed without using references.
- The learner will be given a plumber block and the necessary tools and equipment and must pack the plumber block to the following standards:
  - The plumber block must be cleaned and dismantled correctly as described in these notes.
  - All the old grease must be replaced with new grease.
  - The seals must touch all the way around the shaft and must not be hard.
  - The plumber block must be reassembled correctly.

HAZARD IDENTIFICATION AND CONTROL (HIAC) FORM

LUB-2

PACK A PLUMBER BLOCK

STEPS IN OPERATION / PROCESS	POTENTIAL ACCIDENT / INCIDENT	CONTROLS (BY RESPONSIBLE PERSON)
1. Use hand tools.	• Using damaged tools or wrong tools for the job can cause injury and damage to equipment.	• Always use the correct tool for the job. • Ensure tools are in good condition. • Use tools correctly. • Wear appropriate PPE. • Always take good care of tools. Maintain, clean and store it properly.

NOTE: Before doing the practical work contained in this module, the learner must study the content of the above HIAC form again and then sign the statement below.

The above risks, which will be encountered in this module, are fully understood and will be controlled during the practical work.

Signature of learner: _____

Signature of Training Officer: _____

Date: _____

1. GREASE LUBRICATION

ITEM / TASK: Introduction.

DESCRIPTION:

A. Grease is oil that has been thickened to the desired consistency by the addition of mineral soap, or specially treated clay.
B. It was mentioned in module LUB-1 that either grease or oil can be used as a lubricant. Oil is generally preferred because it is a better coolant. It generates less internal friction. It is easier to handle and apply and finally, it forms a more uniform film than grease.
C. There are, however, certain applications where grease has very definite advantages and they are discussed below.

ITEM / TASK: Application of grease lubrication methods.

DESCRIPTION:

A. Grease is used where the parts to be lubricated are hard to reach. If grease is used instead of oil the frequency of lubrication can be lengthened.
B. It is preferable to use grease where operating temperatures are too high to use oil,.
C. Grease is a much better sealing agent than oil and is, therefore, used where it is desirable, or necessary, to form a seal to prevent contamination.
    - Because of friction, heat is generated and the grease becomes thinner. The thinner grease will then escape from the ends of the bearing area, cool down and form a seal. See Fig 1.
    - Any dirt, rust or foreign material which could enter the contact area is prevented from doing so by the grease. If the narrow clearance space between the shaft and the bearing is filled with grease there is less chance for contaminants to enter.

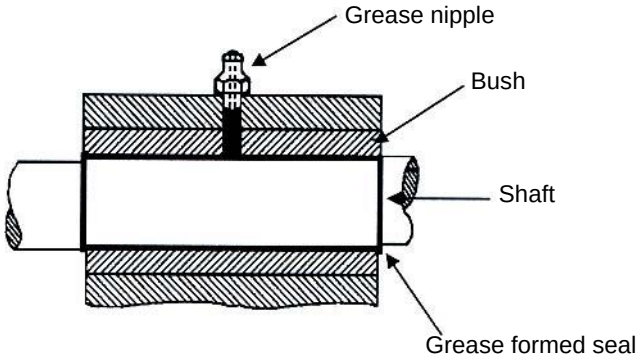


FIG 1.

ITEM / TASK: Manual grease lubrication methods.

DESCRIPTION:

The three basic methods of applying grease manually are:

- through a grease nipple, using a pump type grease gun,
- using a screw type grease cap lubricator, and
- packing by hand.

A. **Grease gun and nipple method.**

- A grease nipple is fitted to the part to be greased. (Fig 2)

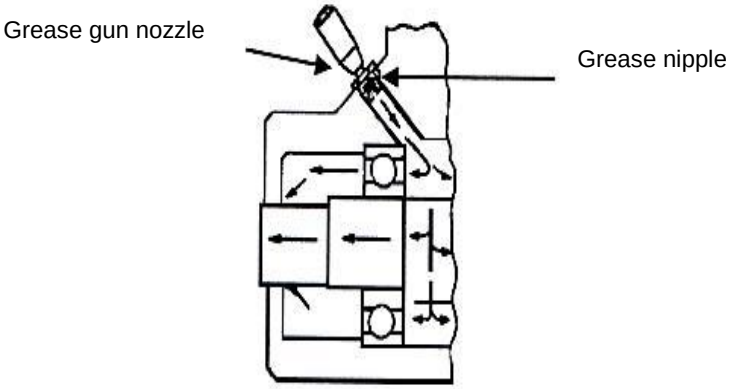


FIG 2.

- The grease nipple has a spring-loaded ball at its front as shown in Fig 3. This ball prevents any dirt entering the housing or the plumber block through the nipple. It is also impossible for the grease to escape through the nipple. It is possible, therefore, to fit the nipple in an upside down position.

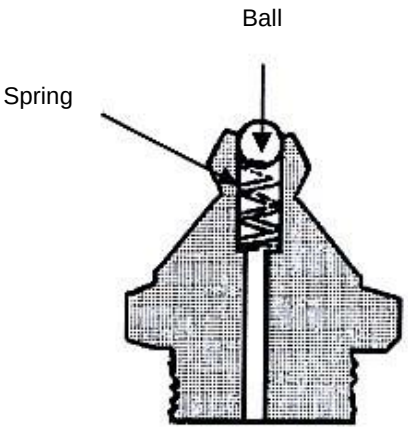


FIG 3.

- A pump-type grease gun (Fig 4 below) is used to pump the grease into the part.

  Grease guns may vary in design and construction, but their principle of operation is the same.

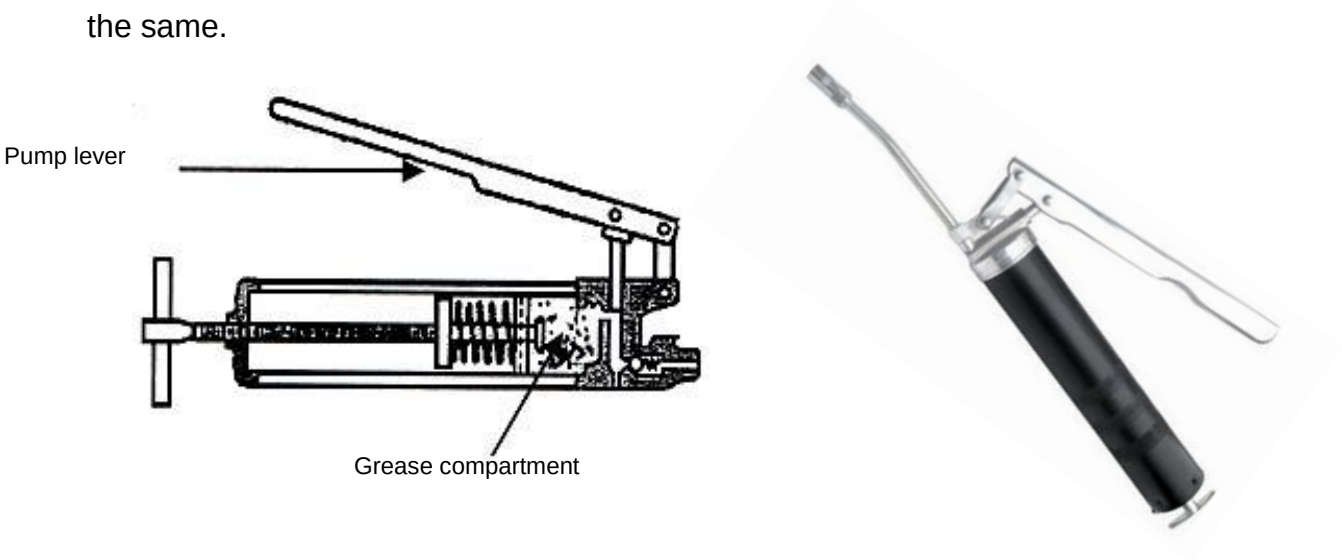


FIG 4.

- The grease gun creates pressure in its grease compartment so that the new grease under pressure in it, can overcome the resistance of the old grease in the cavities of bearings, bushes or other parts of equipment, and force it out.

B. **The grease cup lubricator.**

- Another method of forcing grease into a grease cavity is by using a screw type grease cup (Fig 5). When the cup is filled with grease and screwed into the bottom part, the grease is forced into the cavity and lubricates the journal. (Shaft)

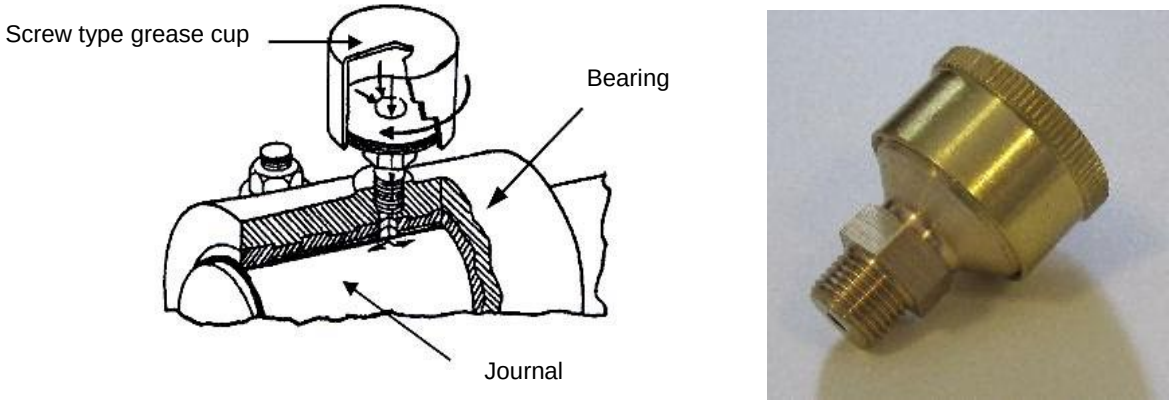


FIG 5.

C. **Packing grease by hand.**

- Grease can also be applied by hand, for example when packing the wheel bearings of a motor car or packing a plumber block.

The latter is described in detail later in the module.

2. PACK A PLUMBER BLOCK

ITEM / TASK: Preparation.

DESCRIPTION:

- Remove all dirt on the outside of the plumber block.
- Make corresponding marks on the top and the bottom half of the plumber block (Fig 6) to ensure correct reassembling.
- Remove the top half.
- Remove the old grease.

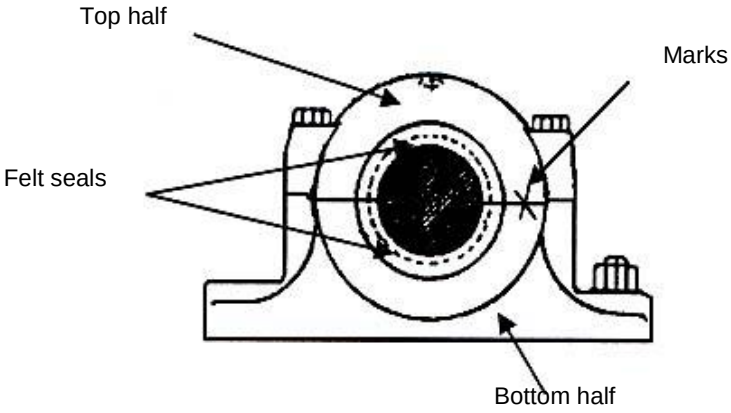


FIG 6.

ITEM / TASK: Pack the plumber block.

DESCRIPTION:

- Force out any remaining grease by pressing in the new grease between the balls or rollers of the bearing with the thumb.
- Pack any remaining spaces in the plumber block with new grease.

Note:

- Slow running bearings (less than 200 rpm) are subject to contamination by dirt and moisture and the housing should be filled completely.
- In the case of bearings operating at high speeds (more than 200 rpm), e.g. the front wheel bearings of a motor vehicle, only two thirds of the free space of the housing should be filled with grease.

N.B. AVOID CONTAMINATION OF BEARINGS AND GREASE AT ALL TIMES.

ITEM / TASK: Reassemble the plumber block.

DESCRIPTION:

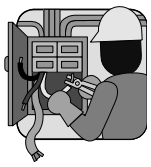
- Remove the seals (See Fig 6 on the previous page) and check that they still maintain contact with the shaft, and whether they have hardened or collected dirt.
- Replace the seals with new ones if necessary, i.e. if they have become hard and do not seal all the way around the shaft.
- Fit the seals into the grooves.

  NB:

  If the plumber block is fitted with felt rings:

  - The felt rings should be dipped into hot mineral oil and properly pressed into their grooves in the plumber block.
  - Care should be taken to prevent the ends of the felt rings and O-ring being trapped between the top and bottom halves of the plumber block as this will prevent the housing from closing properly.
- Replace the top cap of the plumber block. Ensure that the marks correspond.

DO THE PRACTICE ON THE NEXT PAGE.



PRACTICE

Remove the old grease from the plumber block provided and pack it with new grease by following the steps described.

Ask your Training Officer to check your work and if it is correct, to sign below.

LEARNER	TRAINING OFFICER
DATE :	DATE :
SIGNATURE :	SIGNATURE :

REMEMBER ALWAYS WORK SAFE

Once you have passed the practice, you are now at liberty to request a Formative Assessment from your Assessor.