INTRODUCTION

- Lubricants/greases are high value and most important material for reliable and safe operations of various types of bearings used in electrical locomotives/EMUs.
- To achieve desired performance of bearings, besides lubricating/greasing periodically, equal importance and care need to be taken right from manufacturing, transportation, storage, handling and point of usage of lubricants.
- If not handled and stored properly, they can deteriorate or become contaminated and, as a result, provide inadequate lubrication or become waste.
- This pamphlet describes the correct method of loading & unloading, storage and handling of lubricants/greases.

COMMON CAUSES OF CONTAMINATION, DETERIORATION IN HANDLING AND STORAGE OF LUBRICANTS:

- Damaged Containers
- Moisture Condensation
- Dirty Dispensing Equipment
- Exposure to Dust or Chemical Fumes
- Poor Outdoor Storage Practices
- Mixing different Brands or Types
- Exposure to Excessive Heat or Cold
- Exceeded Shelf Life

Careless handling can cause leaks, contamination of the contents, and smudge, tear, or otherwise damage the labels. Care is the key to safe drum handling. A full drum weighs about 180-200 kgs and, if handled carelessly, can injure workers or damage other property.

LOADING & UNLOADING

- Barrels are loaded on to railway wagons and containerized trucks by forklifts or by rolling manually.
- Unloading also needs to be carried out in the same way i.e. fork lift and rolling down carefully to see there is no damage to the handling staff and the barrels.
- Correct unloading procedures will prevent damage to drums and injury to personnel.
- Do not unload drums by dropping them from the delivery truck or freight car to the ground or unloading dock. The drum's seams can be punctured or burst, resulting in a hazardous spill situation.
- Drums can also be unloaded from trucks or freight cars by sliding them down on wood or metal skids.
- Before unloading with skids, set truck brakes and chock the wheels. Attach skid to the truck or freight-car bed securely.
- NEVER allow a drum to skid or roll under it's own momentum, always keep direct control.

- Once unloaded, the drums should be moved immediately to the storage area.
- The best way is by fork truck, with the drums secured on pallets or held by fork.
- If using fork jaws, the jaws must have adapters that take the same shape or curvature of the standard 55-gallon drum.
- If fork trucks are not available, barrel trucks or drum handlers can be used.

- If the floor between the unloading and storage areas is flat and smooth, drums can be rolled into the storage area.
- The drum's hoops (also called chimes) will protect it from damage, but care must be taken to avoid rolling the drum over sharp objects that could puncture shell.
- Also, DO NOT allow the drum to slam on the ground when repositioning it from its upright position to its side.
- Two people should handle any repositioning and rolling of a drum.
- Again, NEVER allow the drum to roll under it's own momentum, maintain firm control of drum speed.

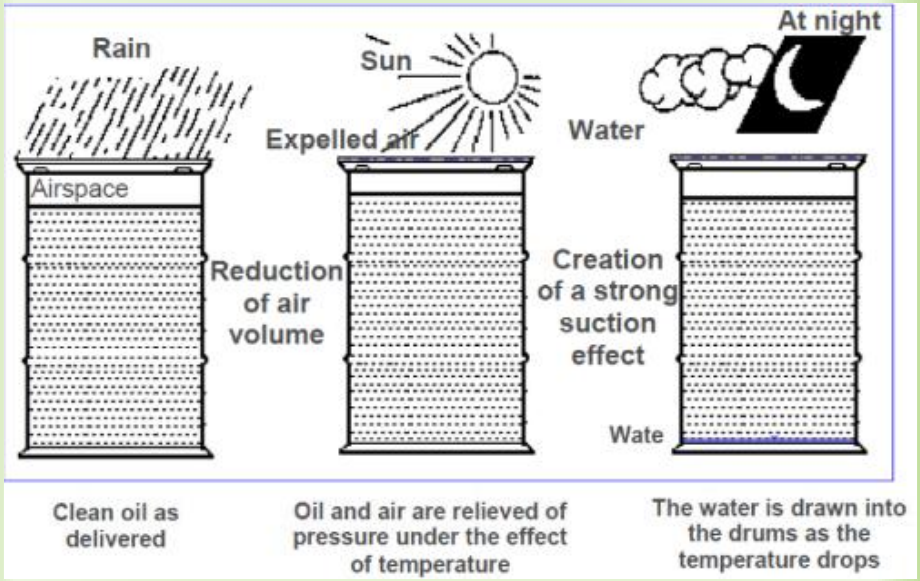
STORAGE OF BARRELS

- All barrels must be stored, preferably, **indoors** away from extreme heat/cold, dust, acidic fumes and moist atmospheric conditions.
- Lubricating oil barrels should be stored horizontally preferably on wooden rails dunnage (packing) several inches above the ground to avoid contact with the ground and to prevent moisture damage.
- The **barrels bungs** (port holes) should be in the clock position at 3 and 9 (horizontal to each other) as shown in picture bellow:

- This will prevent ingress of moisture from the atmosphere due to the breathing action of the barrels through the bungs. The oil is always under pressure at the bungs so that there is no breathing taking place.
- Grease barrels must be stored **vertically** preferably covered with **tarpaulin if not stored indoors.**
- Store different grades of lubricants in separate lots and preferably labeled to indicate the grade brand name and indented application.
- First in and first out (FIFO) must be followed while issuing the lubricant barrels. Maintain optimum inventory so that the lubricants are not overstocked. This will also brings down inventory cost.

Storing lubricants outdoors is a poor practice.

- If lubricants have to be stored outdoors, take certain precautions to minimize harmful effects.
- If the drums are stored on end with bungs on top, water may seep into the drums through the bungs and contaminate or destroy the contents or form rust on the inside of the drum.
- Rain or condensed atmospheric moisture which collects inside the chime can be drawn down through the bung as the drum breathes with the rise and fall of ambient temperature and pressure.
- This can occur even if the drums have never been opened.



COLOUR CODING

- The barrels and containers can be colour coded by giving particular colour identifying the grade and its usage for better identification by working staff.
- Simple symbols like Δ O etc. can be given for indicating the frequency of lubrication i.e. daily, weekly, monthly, yearly etc.

METHOD OF TAKING OUT LUBRICANTS FROM CONTAINER

- Use different dispensing equipment/containers for different grades of lubricants to prevent contamination.
- Always take out just the required quantity of lubricants for replenishing/top up in the bearings.
- For dispensing greases from barrels, use a steel spatula to remove grease layer by layer, do not create a well like structure so that the oil oozes in the vertex.

SHELF LIFE OF LUBRICANT & GREASES

- The word shelf life for lubricant/greases is a misnomer (misleading) as lubricant/greases being complex mixture of base oils and additives do not deteriorate on its **own if stored under ideal conditions, as recommended by the manufacturer.**
- The shelf life of lubricant/ greases depends upon various factors like composition, storage condition, ingress of moisture, dust, contamination etc. However efforts should be made not to store excess quantity.
- Efforts should be made for proper inventory control and use the lubricant/greases within few months preferably within 6 to 12 months. While placing purchase orders on the manufacturers, staggered supply of lubricants can be asked for.
- Lubricant/greases can be retested if for some reasons need longer storage. Retesting frequency of one year is recommended which can be done at user end.
- Experience shows that lubricant/greases when stored properly do not deteriorate even after period of 5 years.

TIPS TO IMPROVE LUBRICANT STORAGE AND HANDLING

- ✓ Keep containers tightly covered.
- ✓ Wipe off the edges of a container before opening it to avoid intrusion of dirt.
- ✓ Where necessary, grease should be brought to a satisfactory dispensing temperature just before being put into service.
- ✓ Clean grease-handling tools (such as spatulas, drum pumps, etc.)
- ✓ When a container has been partially emptied and the remainder will not be immediately used, all void spaces within the remaining grease should be filled with grease, and the surface leveled and smoothed.
- ✓ Store grease cartridges (tubes) vertically with the removable cap up.

CONCLUSION

If the lubricant/greases are stored properly it retains its properties for long time. Lubricant/greases can deteriorate very fast due to the external factors like ingress of moisture, dust, and contamination etc. even within a few days.

Ensuring proper indenting, inventory control, proper storage & handling, retesting if required, can ensure the proper use of lubricants and avoiding its deteriorations in properties.

Disclaimer:

It is clarified that this pamphlet does not supersede any existing provisions laid down by Railway Board, RDSO, Zonal Railways or manufacturers The pamphlet is for guidance only and it is not a statutory document.

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भारत सरकार **GOVERNMENT OF INDIA**
रेल मंत्रालय MINISTRY OF RAILWAYS

PAMPHLET
ON

STORAGE AND HANDLING OF LUBRICANTS USED IN ELECTRIC LOCOMOTIVES/EMUS

End User : Electric Loco Sheds/EMU Car Sheds/Workshop

CAMTECH/E/2018-19/EP-05/Lubricants/1.0

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