

Storage & Handling - Fundamentals

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STLE Basic Education Seminar –
Toronto Chapter

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LUBRICANTS

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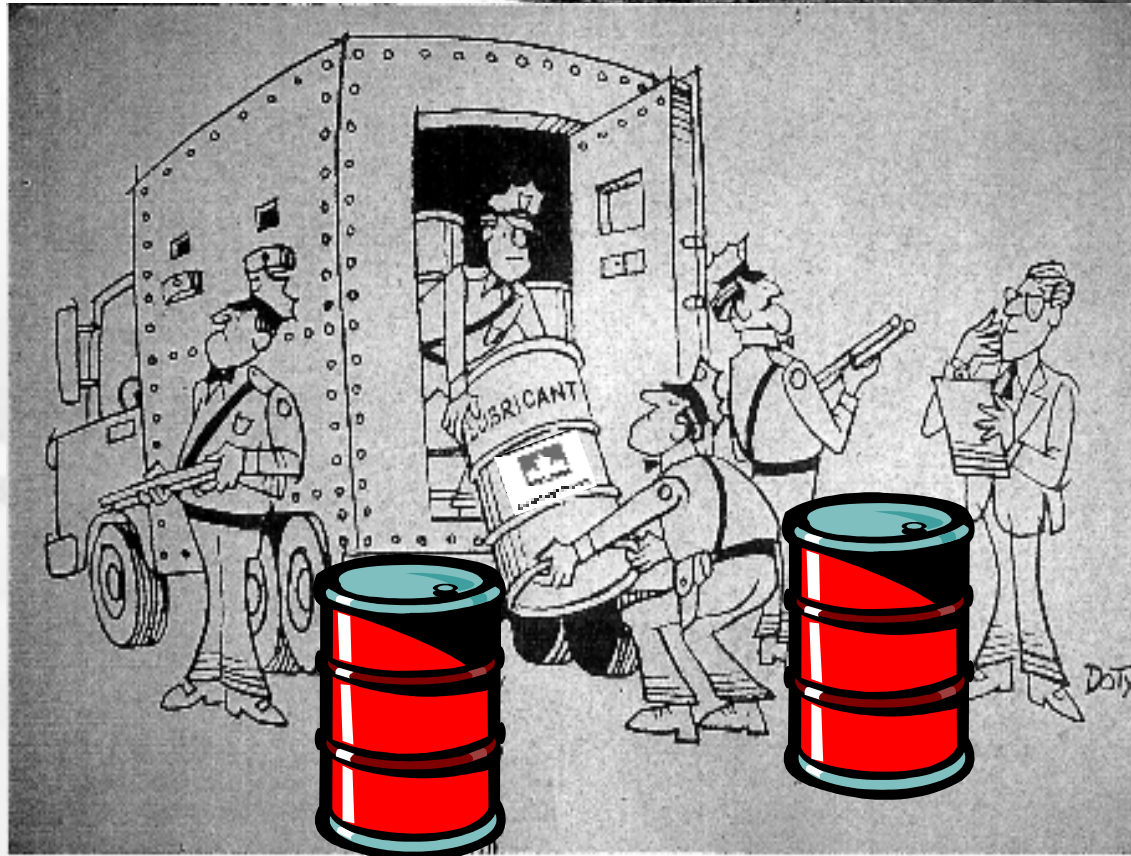
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- Joined Petro-Canada America Lubricants- April 2014
- Mobil Oil Corp – June 1991-November 1999
 - Industrial Sales Engineer 1991-1993
 - Indianapolis, IN
 - Allentown, PA
 - ExxonMobil Corp -
 - Lubrication Engineer 1994-2014
 - Syracuse, NY
 - Saint Louis, MO
 - Miami, FL (International – Caribbean/Central America)
 - Milwaukee, WI
- Bachelor of Science in Mechanical Engineering Purdue University (1991)
- Certified Lubrication Specialist (CLS), October 1996 *Society of Tribologists & Lubrication Engineers (STLE)*
- Certified Manufacturing Technician (CMfgT) 1990 *Society of Manufacturing Engineers (SME)*

Storage & Handling of Lubricants



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Storage & Handling of Lubricants

Learning Objectives :

- Proper 'handling' of lubricant containers being delivered/received.
- Proper 'storage' of lubricant containers on the premises.
- Dedication of lubricant pumps, hoses & transfer containers by product 'family'
- Establish color-coded system for oils & greases
- Establish a dedicated 'used oil' container away from new product.
- Discard all lubricant & containers that have exceeded shelf life and are obsolete. *Consult your lubricant supplier for advice.*
- Establish First in First out (FIFO) culture
- Maintain proper 'house-keeping' practices

Storage & Handling of Lubricants

These transfer containers are not acceptable



Storage & Handling of Lubricants



5-Gallon
Bucket

Gallon jugs

Old Coffee Containers

Manual drum pumps look OK

Storage & Handling of Lubricants



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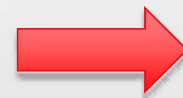
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Good Storage & Handling

Why bother??

- to preserve the integrity of the oil and grease lubricants
 - to guard against contamination of the lubricant
- to preserve the identification and precautionary labeling
 - important for plant & personal safety
 - protect against health hazards
 - minimize the risk of environmental contamination

RESULT = Economic & Operational Rewards



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Economic Benefits

Good Storage and Handling

- Elimination of waste due to :
 - leakage or spills from damaged or improperly closed containers
 - contamination due to exposure of lubricants to dust, metal particles, fumes and moisture
 - deterioration due to prolonged storage
 - residual oil or grease left in containers at the time of disposal or return
 - mixing of different brands or types of lubricants that are incompatible
 - leaks, spills and drips when charging a reservoir or lubricating a machine

Good Storage & Handling

Operating Benefits

- Reduced lubricant caused/related machine problems hence, reduced downtime for repairs
- Reduced material handling time (labor cost can be as high as 8 times the cost of the lubricant)
- Better housekeeping. Oil and grease spilled on floors is a major safety and fire hazard.

Good Storage & Handling

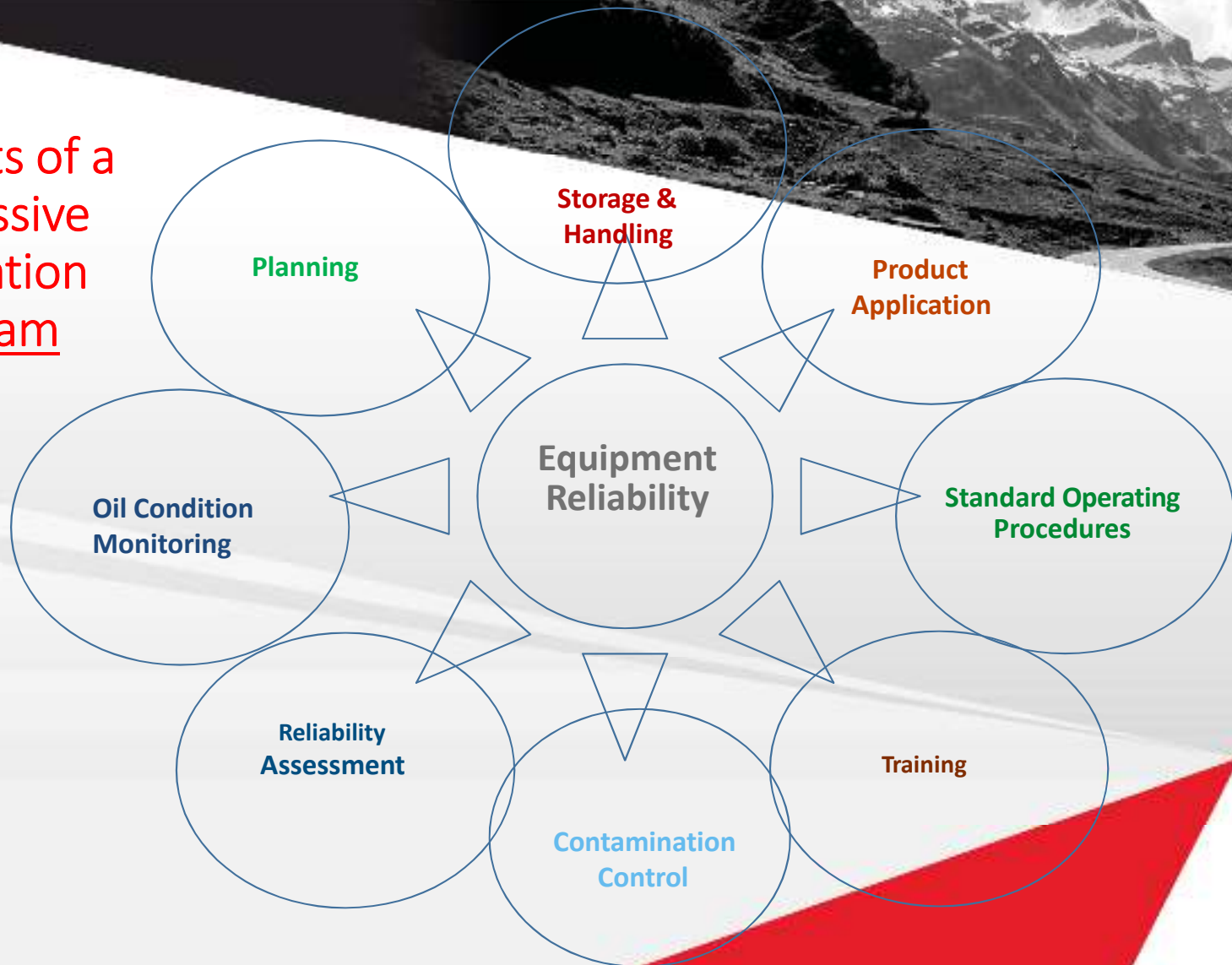
Why the concern?

- Careless handling of a full drum can lead to injury and damage plant property
 - Smudging, ripping or wearing off of drum labels - leading to incorrect usage of lubricants
 - Container leaks that create a messy, hazardous environment

Good Storage & Handling

- Proper storage & handling of lubricants makes good economic, operational & safety sense.
- Many 'users' are unaware of the need to treat lubricants with extreme care.
- We can add value to any business by assisting with good storage & handling practices & culture change.

Elements of a progressive Lubrication Program

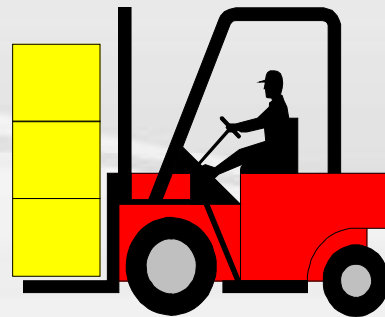


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Handling

Fork Lift Trucks

- For large quantities of oil/grease drums or over long distances
- For smaller plants, use manually powered or hand pallet trucks

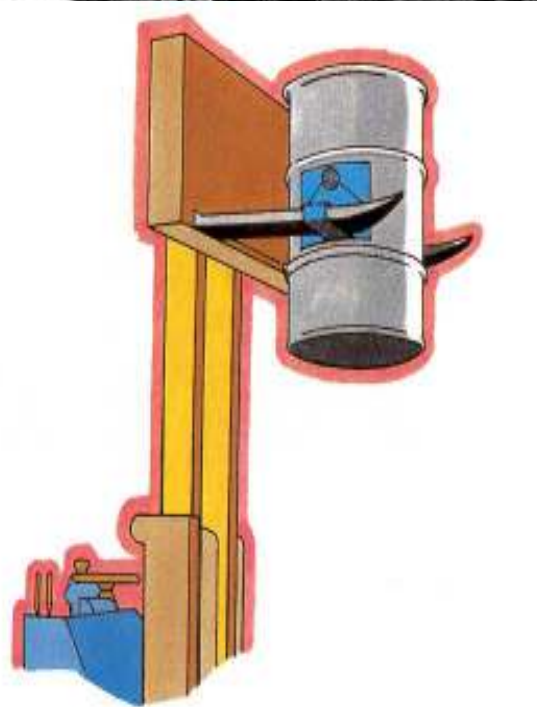


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Handling

Drum Handling Attachments

Special drum shoes that enable forklift operators to move single drums to the storage area or onto pallets – safely !!



Handling

Four-Drum Fork Lift Attachments

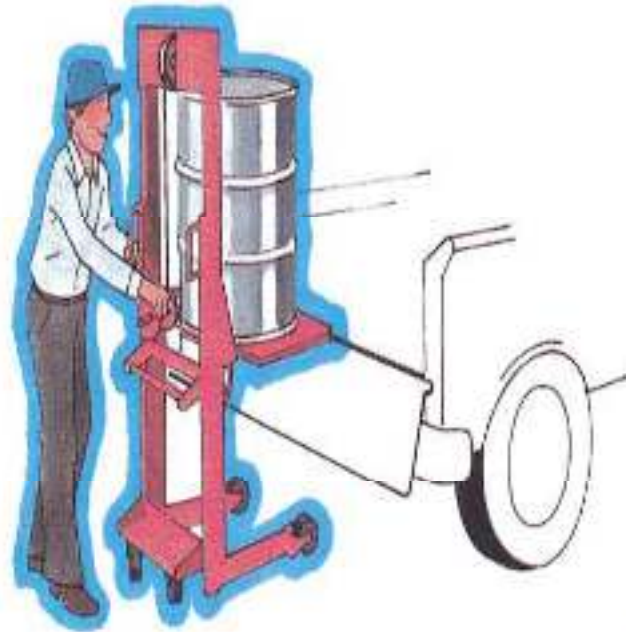
These clamp devices enable an operator to move from one to four drums simultaneously in an upright position, whether to the oil storage area or onto pallets.



Handling

Manual Portable Elevators

These manually propelled (either cable or hydraulically-elevated platforms) reach into a truck from ground level to receive drums.



Handling

55-gallon drums

The majority of oil sold world-wide is in 55-gallon drums. One safe and effective means of delivering these drums is via effective and efficient ramps as shown.



Handling

Rolling

Move the drums by rolling them. Always use the 'buddy' system. They are heavy

Oil and/or grease drums can weigh between 385 – 440 pounds each.



Handling

Triangular Dollies

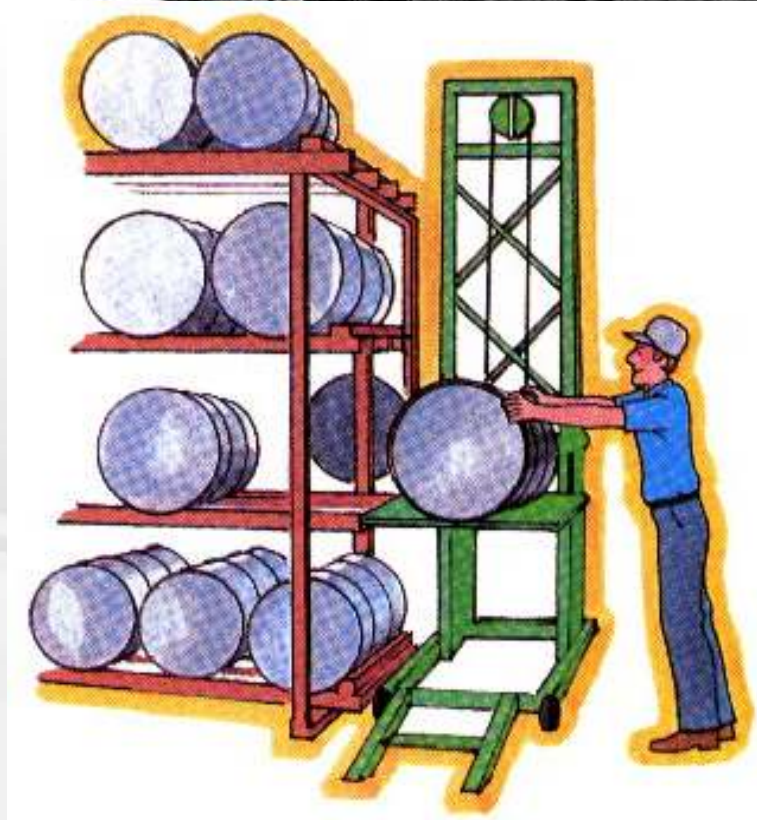
These devices have projecting lugs that can hold a barrel firmly in position.



Handling

Portable Stackers

These are commonly used for moving drums in and out of storage racks.



Handling

Chain Hoist & Trolley On I-Beam Bridge

These move drums easily in and out of storage.



Handling

Barrel Trucks

These are hook-type, two-wheel hand trucks that enable a worker to move a heavy drum by himself.



Handling

Dropping

Avoid doing this.

Why??



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Handling

Improper handling of drums can cause:

- Broken Seals
- Leaks which will potentially lead to human spills/falls and injury.
- Labeling can be distorted during improper handling resulting in an 'unknown' lubricant in the drum.



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Handling

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- Broken Seals
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Contamination by External Impurities



If one does not properly protect the oils to be used in the plant, contamination can easily get from the containers into the plant equipment. These contaminants can easily cause wear of critical parts & increase the oxidation of the oils reducing their useful life. Misuse or improper storage of oil 'application equipment' is the primary cause of oil contamination.

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MANAGE CONTAMINATION

*The single greatest opportunity
for increasing component life
and lowering operating costs is
to effectively manage fluid
cleanliness.*

Handling

- Preserving the integrity of the fluid while getting it from storage to usage
- Bear in mind that often the best ways are also the easiest and most efficient ways



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Handling

Improper use of top-up/small
oil change out containers



STORAGE & HANDLING

It does not matter how great our *'predictive & preventative maintenance'* practices are in any plant if we can't assure the right clean oil; at the right time, in the right amount at the machines.

Basic Storage & Handling techniques have to be met in order to implement a world class maintenance program



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Proper Containers

- No Open Containers
- Properly Marked & Preferred Color Coded
- Oil Safe[®] / iCan[®]



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Handling

The ideal situation is to have all oil dispensers properly labeled with the correct lubricant and an (acceptable) color code for lids!

Lube Tags on all equipment oil fill reservoirs is highly recommended for an efficient and effective maintenance program.



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Handling

Containers that reduce the potential and risk of adding unwanted contamination.



Courtesy Proactive Lube Manager Inc.



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Handling

Don't be afraid to go one step better.

- Consider properly color-coded and marked containers with air breathers and hand pumps with quick couplers.



Handling



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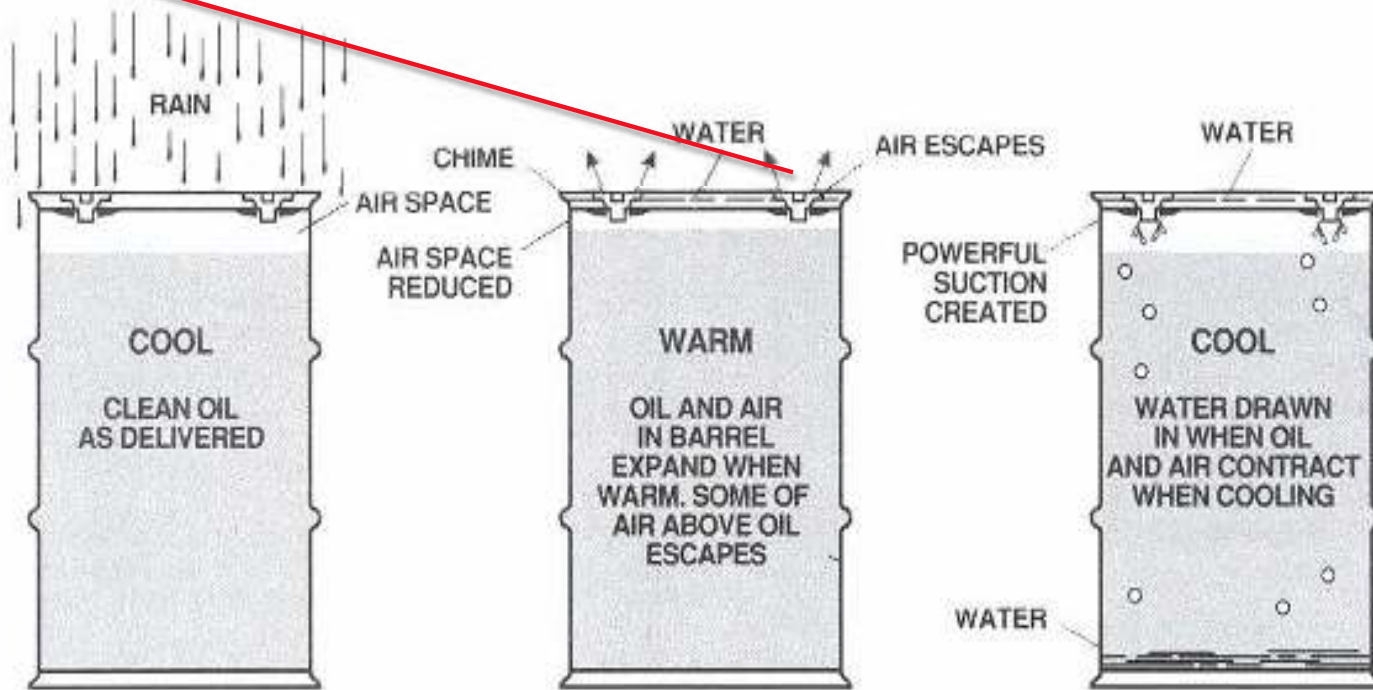
Handling

Contamination by other Lubricants

Contamination due to mixing oils of different viscosities and characteristics of application cause damage to the equipment.



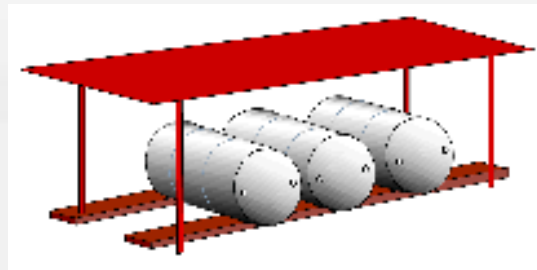
Storage



Moisture Breathing in an Upright Drum

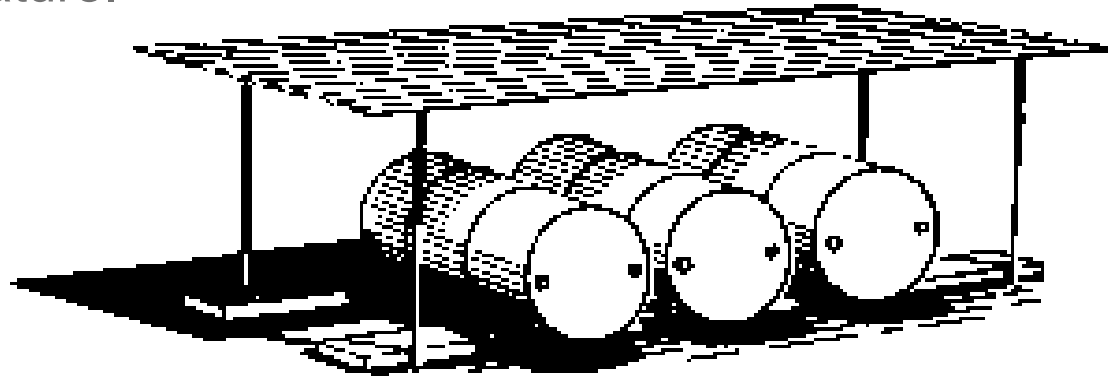
Lubricant Storage: Outdoors

- Store containers clear off the ground
 - Prevent - contamination, leakage
- Cover facility if possible
- Drums “breathe”
- Drum labels do Not weather well



Storage

Notice the drum bung holes are placed in a horizontal position @ 9 & 3 o'clock. This prevents moisture getting into the oil as these drums will breathe with change in temperature.



Temporary outdoor drum shelter

Storage – Drum Cover

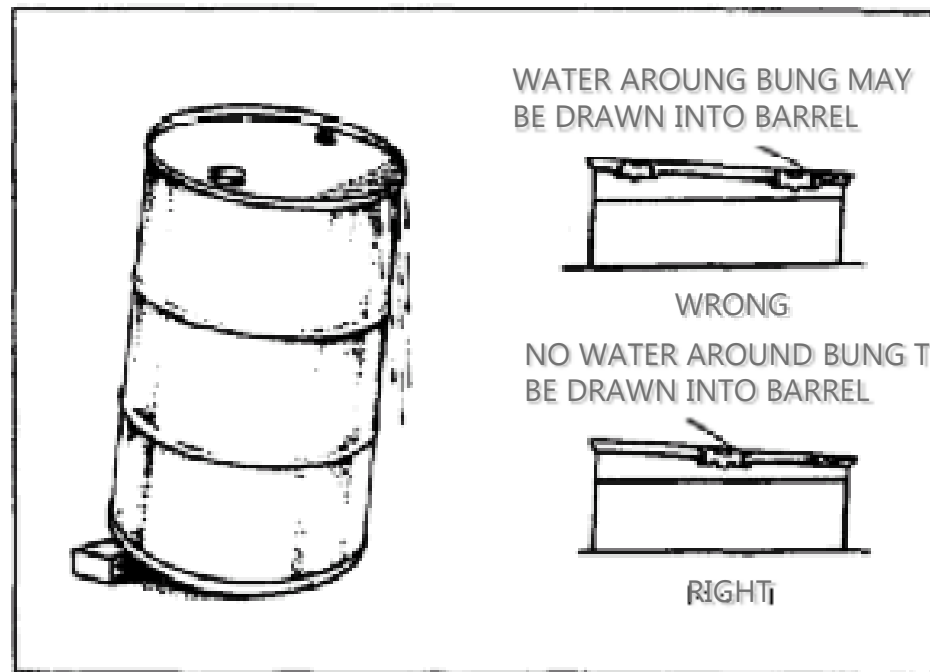


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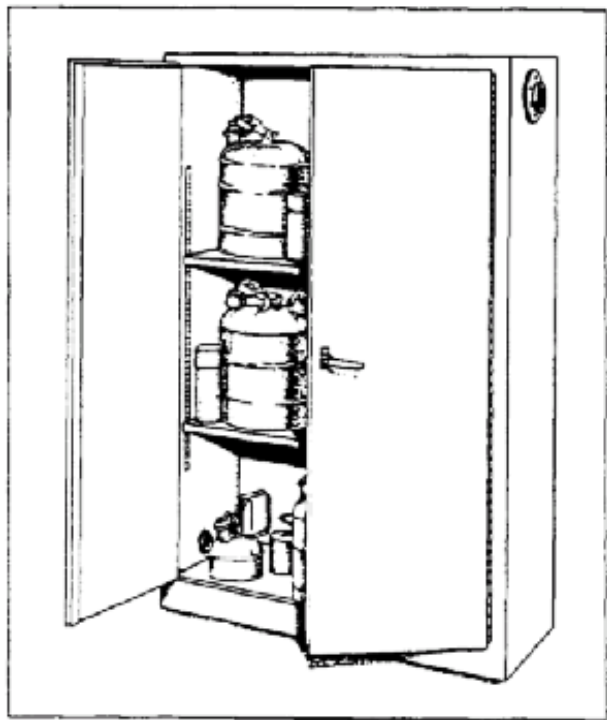
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Storage



Correct Way to Block up a Drum

Storage



Individual Locker

Bulk Containers

- Must be properly identified
- Individual Pumps & Hoses (by Product Family is a requirement)
- Desiccant Breathers
- Fluid Containment may be required



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Lubricant Deterioration In Storage

Long Term Storage

- At moderate temperature - minimal effect on most premium lubricating oils, hydraulic fluids, process oils and waxes
- An approximate guide to maximum recommended storage times for products that may deteriorate are shown below

Product	Maximum Recommended Storage
Lubricants	5-10 years
Greases	24 -36 months

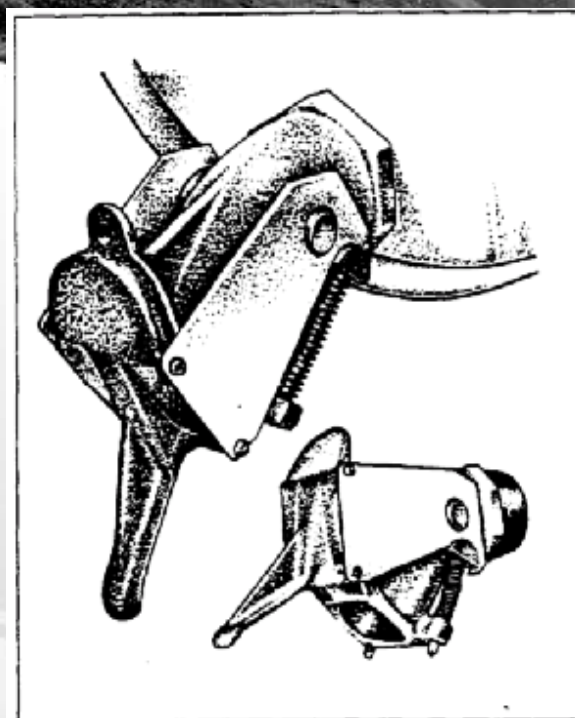


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Typical Lubricant Shelf Life

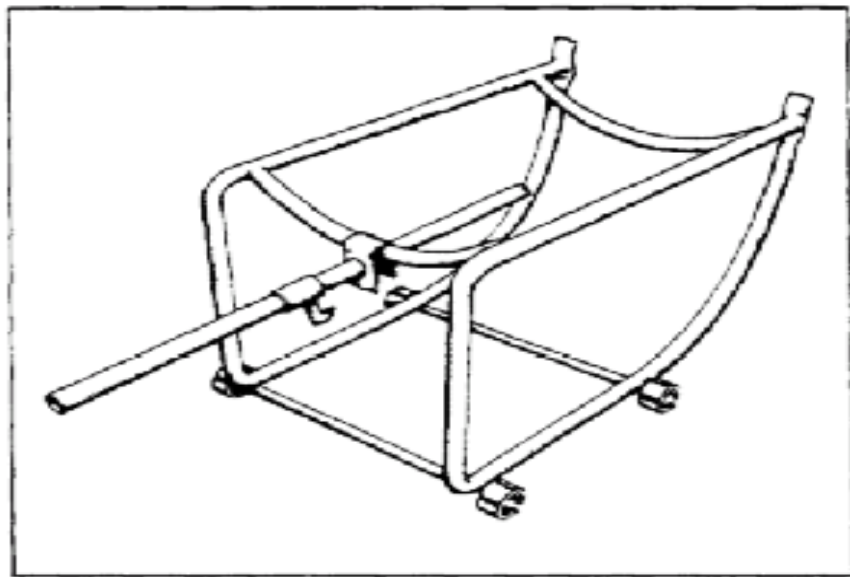
- Greases
 - Soft greases (# 0 and softer) ~1-2 yrs
 - NLGI Grade 1 and stiffer ~3 yrs
- Oils
 - Cutting oils ~ 1 yr for water soluble and 3 yrs for neat
 - Base oils, lightly additized oils ~ 3 yrs
 - Industrial oils (Hydraulic, vacuum pump, etc) ~ 3 yrs
 - Gear oils (industrial and automotive) ~ 3yrs
 - Heavily additized automotive oils (motor, tractor, ATF, etc) ~ 5 yrs (check credentials)

Dispensing



Drum Faucet

Dispensing



Rocker-Type Drum Rack

Dispensing



Hand operated drum pump

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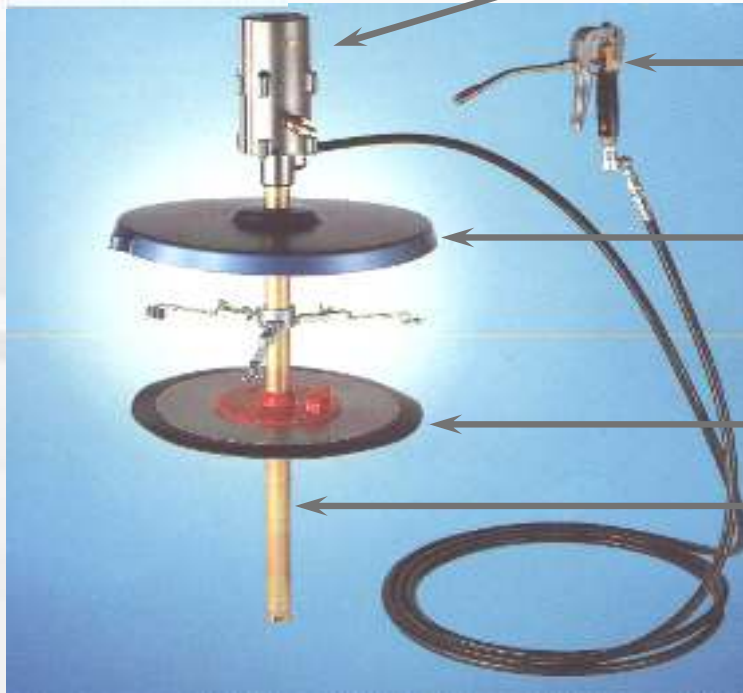


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Dispensing

Pneumatic

Air motor



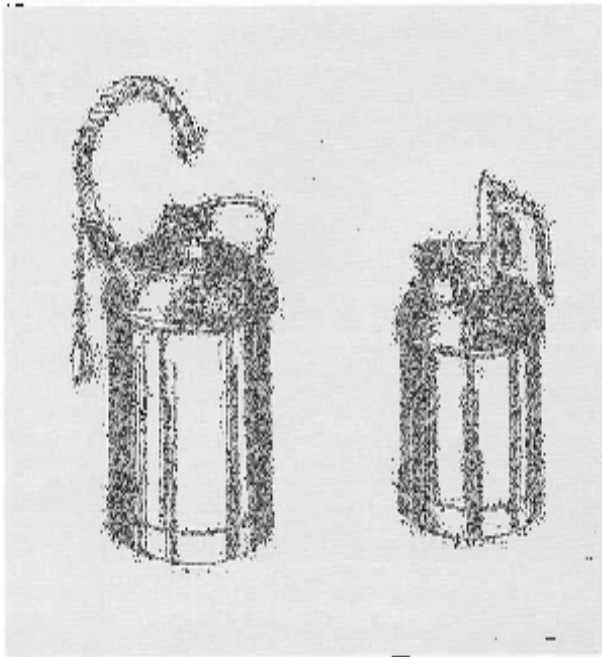
Gun

Cover

Follower Plate

Pump

Dispensing



Larger oil containers



Pistol oiler

Dispensing

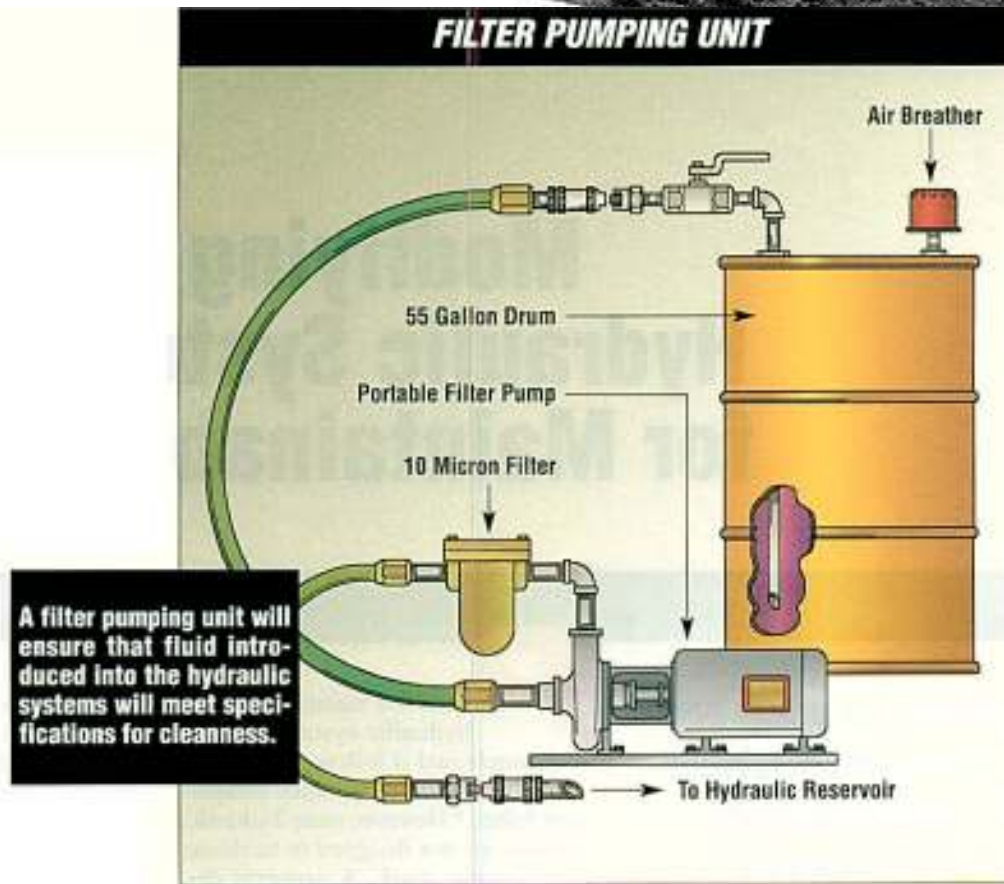


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Dispensing



Dispensing – Filtration Carts



2-Stage Filter Cart



2-Stage Filter Cart



Multi-Stage Filter Cart

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Dispensing – KNOW your Level



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DISTRIBUTION



**HD Portable, (outside) Filtered
"Barrel Buggy" Drum Dispensers**

Good inside storage



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Good practice



PETRO-CANADA

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Good storage practices




Instructions

'Oil Safe' Storage & Dispensing Instructions

Remember to use proper PPE before performing tasks.




Step 1:
Put on gloves.



Step 2:
Attach static discharge cable to edge of drum.



Step 3:
Identify correct color hose for the lubrication to be filled.



Step 4:
Remove fill port inlet end cap and attach suction hose assembly to fill port inlet.

Owner: Petro-Canada
Date Approved: 04/2016
Approved By: [Signature]
PPE: GLOVES
CPL Doc # 02-08-0270-08-0011-00

OPERATING VALVE POSITIONS



Step 5:
Look at the Operation Valve. Confirm in which direction your lubrication fill rate valves will need to be turned.



Step 6:
Turn both fill port valves UP (perpendicular to the top - typical closed position) for the desired lubrication tank. Each valve has a left and right valve that is plumbed down. The wheel is in the middle for each tank. (For example the yellow wheels are the left and right valves for the dark green lubrication tank.)








Step 7:
Press the start button for the appropriate tank to start filling the tank (circulating drums).

Each tank has a dispenser nozzle and start and stop buttons. The dispenser nozzle is in the middle of the ship and start buttons for each tank. (For example: the circular buttons are for gray tank and the square are for the purple.)

Step 8: To dispense:
1) Turn both fill port valves DOWN
2) Open position 2) Choose correct color pipe and place it underneath dispensing nozzle
3) Push down dispensing handle.

Owner: Petro-Canada
Date Approved: 04/2016
Approved By: [Signature]
PPE: GLOVES
CPL Doc # 02-08-0270-08-0011-00

Color/Symbol/Product Name

LUBRICATION TABLE				
FOOD GRADE GREASES				
MLGI # / Base Oil Viscosity	PRODUCT NAME	LUBRICANT TYPE	SYMBOL	SAP #
W110/40 150/220	Petro-Canada Purity F02 Synthetic Heavy 22E	Food Grade Grease		30045277
FOOD GRADE OILS				
ISO GRADE	PRODUCT NAME	LUBRICANT TYPE	SYMBOL	SAP #
68	Petro-Canada Purity 50 Hydraulic Fluid AW 68	Hydraulic Oil		30118056
150	Petro-Canada Purity F0 EP Gear Fluid 150	Blowers/Pumps, Small Gear Drives		30166562
15	Petro-Canada Purity F0 WD 15	Air Lines, Multipurpose Oil		30045276
37.1	Petro-Canada Purity F0 HTF	Heat Transfer Fluid		30144222
220	Petro-Canada Purity F0 Chain Oil Heavy	Open Gears, Chain Oil		30045278
460	Petro-Canada Purity F0 EP Gear Fluid 460	Gear Oil (ISO 460) S2BW		30062737



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Good practices



Bad practices - outside storage



Bad practices - outside storage



Bad practices - outside storage



Drums have rusted thru over many years



Bad practices - outside storage



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End result of bad practice



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End result of bad practice



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End result of bad practice



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Used Oil



2" top draw quick connect drain coupling with internal suction pipe.

12" hinged lockable manway for indoor and outdoor security.

Optional Tank Level Indicator

Debris strainer basket

Secondary Containment provides 120% of inner tank's capacity and is safety yellow.

Forklift channels on 275, 360, and 500 gallon sizes.

Patent #6,474,496

USED OIL ONLY

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HOUSEKEEPING FAILURES

- Sweep floors daily
- Clean up spills immediately
- Keep work benches uncluttered and free of debris
- Limit use of floor storage



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NOW THAT'S BETTER!!



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LUBRICANTS

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Summary

Discard all inventory product that is out of its shelf life.

- Any product not in use or 'not identifiable' should be discarded

Create Wall Labels for Drum Storage/Color Coding by product category.

Create a used oil (properly marked) disposal containment (not a 55-gallon drum) with easy access to pick-up & remove by a recycler.

Proper Lighting in the Lubricant storage area & Temperature controlled.

Color Code & dedicate transfer pumps or drum pump for each lubricant.

Purchase color coded transfer containers to match pumps and equipment tags.

Proper on-going training



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Ultimate Goal for Proper S&H



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QUESTIONS??



THANK YOU

FOR MORE INFORMATION CONTACT

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