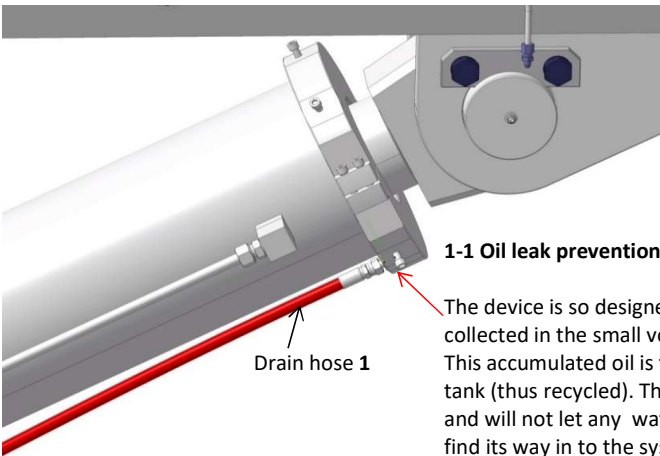


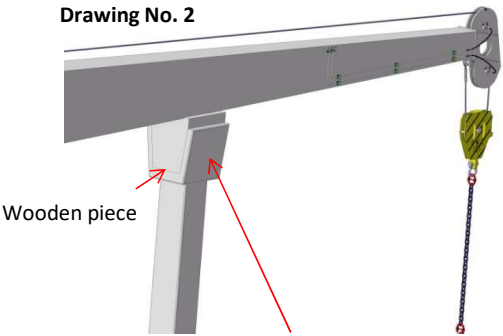
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Ref no.	Z18-190207112	Date	
Customer		Crane	
Ship		Model	
Hull no.		Maker	
SUBJECT	CYLINDER OIL LEAK PREVENTION DEVICE WITH MINI DRILL PUMP		

Drawing No. 1



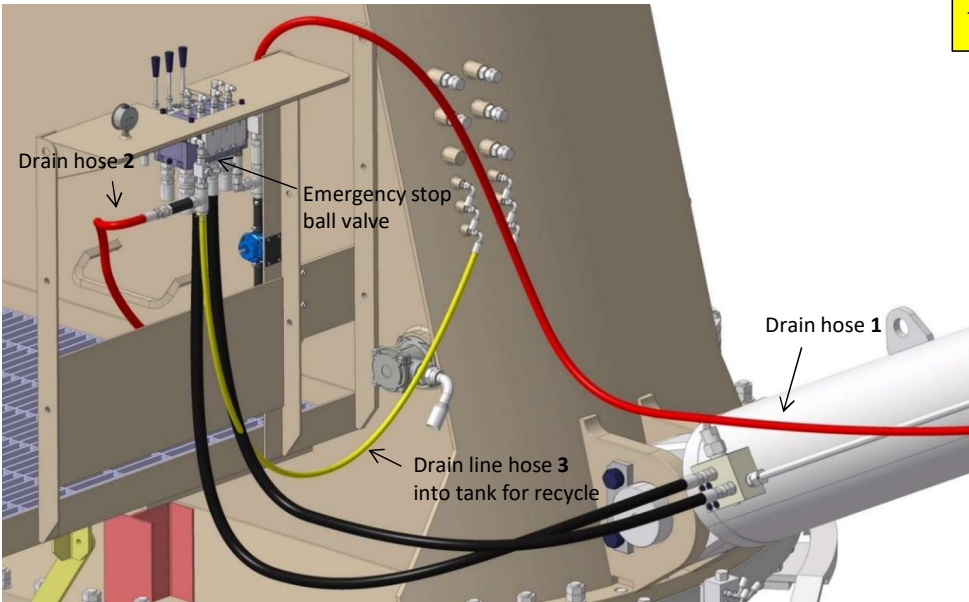
1-1 Oil leak prevention device
The device is so designed that the leaked oil gets collected in the small void created inside the OLPD. This accumulated oil is then lead back to the storage tank (thus recycled). The device is also water tight and will not let any water/moisture or even dust find its way in to the system therefore keeping the system, free from any contamination.

Drawing No. 2



1-2 Note that the Ram is slightly out of the cylinder as the jib is kept at a slight angle, this is to accommodate the OLPD at the top end and to enable this, a wooden piece(as marked) made to size, shall have to be inserted in the jib's rest bracket such as the jib is raised a bit and does not get in contact with the side bracket also.

Drawing No. 3



1-3 The oil which is leaked gets accumulated in the void space of OLPD meant for this purpose and can be transferred through the drain hose 1 and hose 2 (shall be provided with the kit) with help of the drill pump thus recycling the leaked off oil back to the system.



1-4 The oil generally leaks from the upper part of the cylinder, with lower being sealed and the most likely reason of this leak is the damaging of the dust seal inside. This damage to the dust seal ends up letting dust inside further causing abrasion on the sealing surface which then over a period of time, ends up leaking.

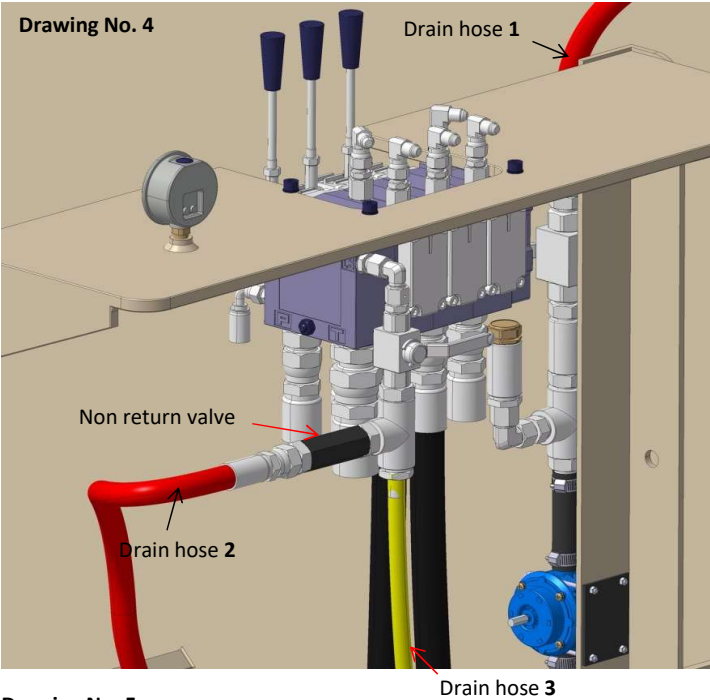


Special sealing for rod (specific rectangular seal and backup-ring)
Special sealing for tube (specific rectangular seal and backup-ring)

1-5 Oil leak prevention device

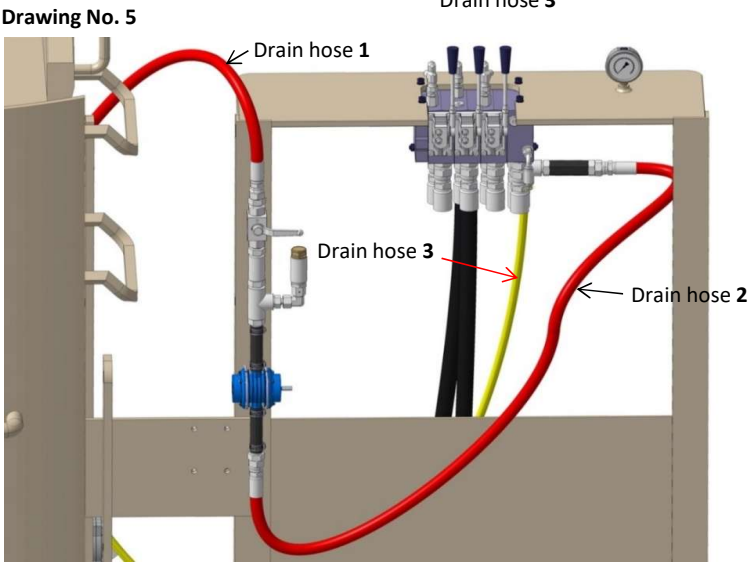


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SUBJECT	CYLINER OIL LEAK PREVENTION DEVICE WITH MINI DRILL PUMP				

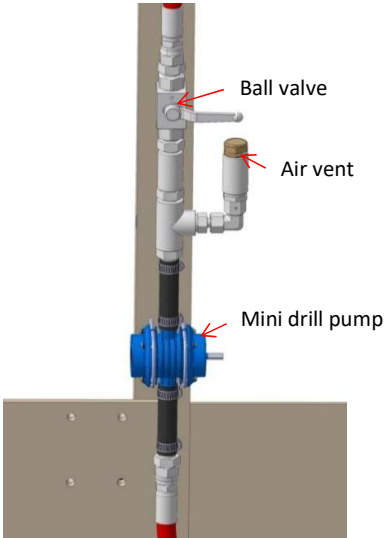


1-6 Hoses connection with non return valve

It shows how each drain hoses are connected
Drain hose 1 : from storage device
Drain hose 2 : from mini drill pump
Drain hose 3 : into tank for recycle
Non return valve prevents any back flow of oil into device.



Drawing No. 6



1-7 OLPD Set up with mini drill pump

The cylinder oil leak prevention device (the OLPD) has been supplemented with a mounted mini drill pump as shown in the drawing here.
This pump is supplied with the OLPD kit as standard supply and its purpose is to pump the accumulated leaked off oil back in to the system.
The pumping timing is to be adjusted by the onboard team basis the quantum of the leak such as the accumulation space is readily available at all the times. This operation is important as the leaked off oil is not going to return to the storage tank by gravity. The pump is to be operated with a drill machine - pneumatic ofcourse, in case of tankers therefore avoiding any necessity to use battery or electric auxiliary device for safety reasons.
The ball valve (shown in Drawing No. 6) is to facilitate the pumping back of oil. When it is closed, the leaked oil reaches the ball valve by gravity and some oil could be noticed coming out of the filter - this is tell-tale sign that the drill pump is to be started and the leaked off oil pumped back to the storage tank.
The air vent facilitates smooth pumping of the leaked off oil back to the system.

Drawing No. 7



NOTE: This product is patented by Zenith MarineTech. Any unauthorized copying or

1-8 Pump mount to frame of main control valve platform

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1-9 A set of mini drill pump



1-10 A set of mini drill pump with drill machine (drill machine not provided with the OLPD kit)

