



ENGINE DAMAGE OUSTED OTHER CLAIMS DUE TO LUBRICATION FAILURE & IMPROPER MAINTENANCE

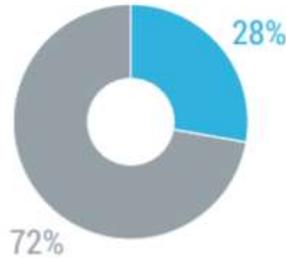
Shipping plays a key role in the world trade. Amid of uncertainties, only trade that keep the world moving is shipping. In ship Main Engine is considered as the heart of the ship that enables in propelling in high and green seas such an important equipment needs to be given extra care. Auxiliary engine comes the second that is available in few numbers aid to generate power to ship. Equipment of this vital importance should be handled with utmost care. However, Insurance clubs' statics proves that Engine damage ousted all other equipment damage as most frequent equipment get affected. Most of the Engine damage had been cited primarily because of the improper maintenance predominantly improper assembling of the engine parts post decarb or maintenance. Followed by, Lubrication failure remains the next main culprit in Engine damage.

To add to the above briefings, below are the insurance club statistics related to the Engine damages



Machinery claims by number

- Main engine claims
- Other machinery claims



Source: Swedish Club

Top 10 claims by cost for machinery claims

Claims type	Number of claims	Average cost (USD)	Change in average cost %
Main engine, excluding turbo charger	202	647,920	21%
Steering	25	572,920	53%
Propulsion	168	476,898	4%
Deck equipment, windlasses	16	456,468	150%
Crane and cargo gear	59	359,901	40%
Auxiliary engine, excluding turbo charger	112	345,823	2%
Boiler	18	334,939	0%
Turbo charger	76	291,191	-7%
Electrical equipment	43	267,924	22%
Lifesaving equipment	1	182,410	-10%

Source: Swedish Club

Engine damages contribute to 16% of the cost of all H&M Claims and 34% of all machinery claims. Thus, Engine damage is “THE” most reoccurring problem.

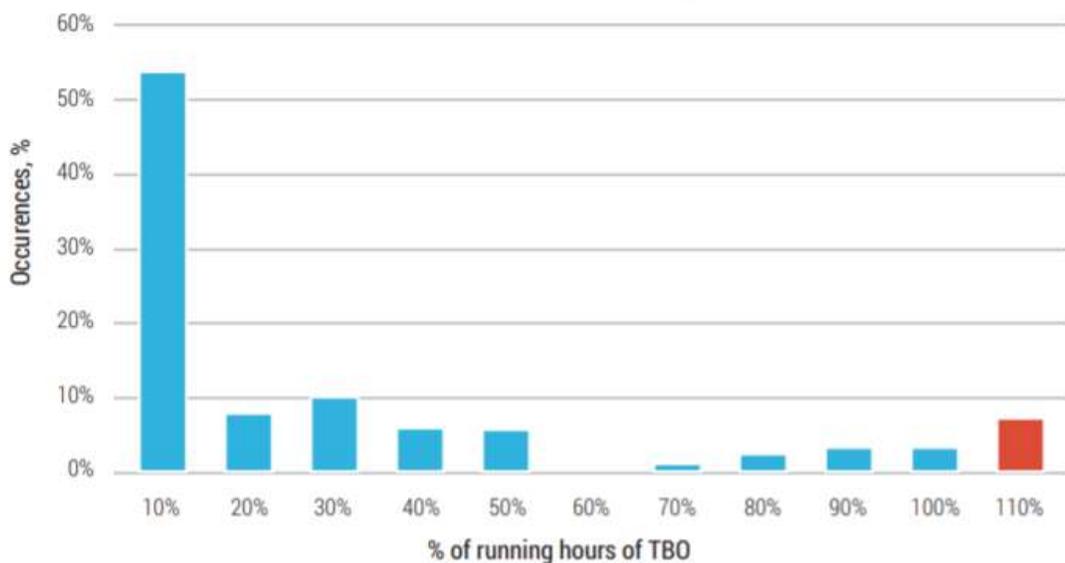
The causes for the Engine damage was mainly due to the failure of components post overhauling due to wrong assembling of the parts or Makers instructions were not followed promptly while overhauling.

General Checks to be done post overhauling the Main Engine before starting:

1. First and foremost, during assembling, post overhauling ensure the Main engine components are fitted back as per the Maker's instructions manual. Especially the hydraulic jacks need to be used in the places as instructed. The pressure to be maintained during tightening, as per the manual, need to follow appropriately. Exact torque as per manual need to be maintained.
2. Maintain the Hydraulic jack and torque tighteners in good condition.
3. Have good count of the small tools used and not to leave anything behind inside the Engine post boxing back.

4. Before starting the Engine follow all the vital checks which includes, Opening the preheat to bring the engine temperature to min 60deg before starting, draining fuel tanks, Ensure correct fuel Viscosity, Correct position of lubricators, Lubricate fuel racks, Start the pre lube pumps (ensure appropriate sump level is maintained) at least 1 hour before starting the slow speed engines, Upon starting the pre lube pump check the vital pump pressure parameters which includes cooling water pressure, Fuel oil temperature, control and starting air pressure, Open indicator cocks and blow throw (check any water coming out due to leakage), rotate the crankshaft by turning gear, much important to disengage the turning gear post turning (an interlock is provided), one engineer need to be present near the engine while the engine is started from the control room to check for any abnormal noise or vibrations.
5. All alarms need to be considered seriously. Frequent rounds of engine room platform to be carried out. Touch/feel factor need to be followed always especially for equipment overhauled recently.
6. If engine is running successfully post the overhaul still a close vigil needs to be maintained as major engine damages occur post overhaul. The below graph demonstrates that 55% casualties occur in first 10% of TBO (Time between overhauls). Majority of the later mentioned casualties had occurred within 1000 hours of operation post overhaul.

Casualties % in relation to TBO recommended by manufacturers



Source: Swedish club

Second most Engine damage occurs due to the Lubrication failure. Lubrication is the lifeline of any Engine. Lubrication system needs to be maintained appropriately in a periodical manner as per the planned maintenance.

Below are few checks to be done to avoid Lubrication failures:

1. Check the sump level manually using the dip stick as that represents the presence of sufficient required level.
2. Execute robust onboard Lubricant management system
3. Ensure onboard Lube oil purification is performed as many a times the Lube purifiers are not operated onboard.
4. Ideal Lube oil temperature needs to be maintained to prevent the oil being exposed to extreme temperature more than its safe working limit.
5. Right category of oil should be used for the respective purpose. Mixing of different grades of oil especially different type of oil that is hydraulic with the mineral oil shouldn't be mixed.
6. Ensure frequent replenishing with fresh oil. Especially for sump oil monitor the BN level and replenish with fresh oil as it not only adds reserve BN but also additives.
7. Remove the used oil completely as soon as it has reached its maximum service hours. As the oil would had got depleted of its vital properties to serve its purpose.
8. Check and clean the Filters as per routine maintenance. Please check properly while cleaning the filters as the broken engine components, smaller in size, might be found in the filters while cleaning indicating some damages occurred.
9. Start the pre lube pump immediately as soon as one-hour notice (for the engine to get prepared) is given or leave the pre lube pump running for short Engine shutdown. Sufficient time to be given for the pre-lube pump to lubricate all the parts before the cranking is initiated.
10. Pump pressures need to be monitored closely any deviation from the usually need to be investigated immediately without delay.

11. Low level tank / sump alarms need to be taken seriously. Damages had occurred when the alarms were taken casually without any action thinking it to be due to rolling or pitching
12. Monitor the turbo charger oil level. Turbocharger, a high rpm machinery any lubrication issue will pose a serious threat not only to the machinery but also to the personnel working nearby. Broken blades will fly and hit the personnel working nearby. Monitor the rpm if any drop should be immediately investigated.
13. Lube oil back wash filters frequency of back wash need to be monitored if any increase in frequency need to be immediately investigated or sudden lube oil sludge tank level rise should be investigated.
14. Prompt upkeeping of sump should be maintained. Any change in the colour of the sump oil or bad odor (rotten egg smell) should be taken seriously as this might be due to the bacteria developed in the sump due to unclean sump.
15. Frequent (when time permits) inspection of crankcase to be carried out as any major water leakages into sump can be noticed.

Understand the hidden issues of Engines by frequent testing of Lube oil samples from an accredited Laboratory. As the saying goes, "Prevention is better than cure" Lubrication failure can be detected well in advance by periodical testing of used Lubricants. Lubricant testing will be costing in two digits usd but if left unchecked the dollars spent for the damage will amount more than three digits usd.

Proper interpretation of test results to be done. Prompt investigations need to be carried out when deviation from normal results or discrepancy is witnessed.

Tribocare is leading the way in Lubricant testing especially for the Marine sector. All types of Lubricant analysis from the regular routine analysis to advanced analysis are done. Scavenge drain analysis are done in a brief way with insightful interpretation. For more info please contact

info@tribocare.com