



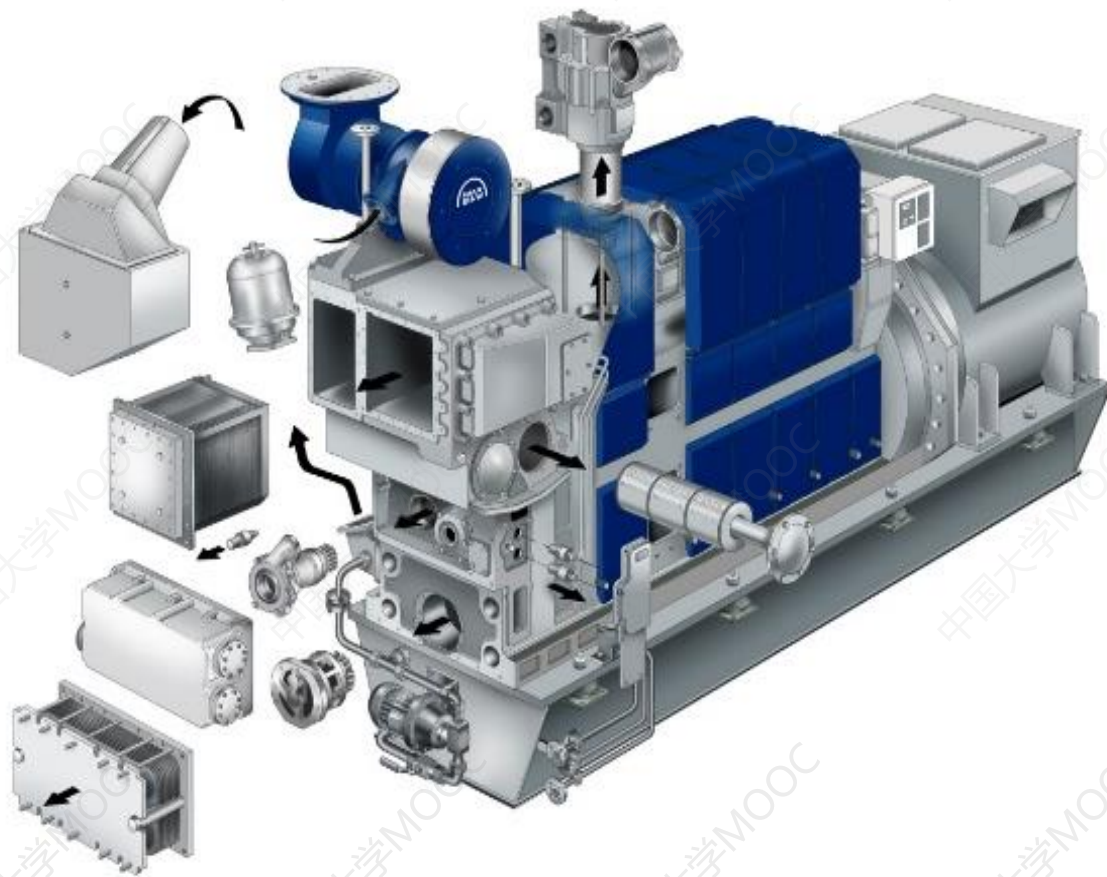
大连海事大学
DALIAN MARITIME UNIVERSITY



中国大学MOOC

筒形活塞式柴油机

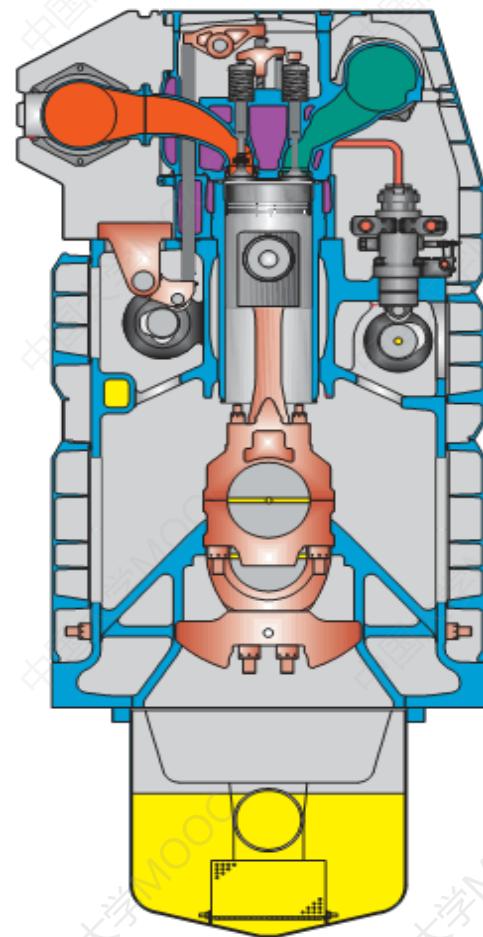
Acknowledgements: The technical contents of this presentation are mainly from the websites and training files of Wärtsilä, Daihatsu and MAN Energy Solutions. Many thanks to them.
Contact us: dmumde@163.com



• 摩擦副

- 主轴颈-主轴承
- 曲柄销-连杆大端轴承
- 活塞销-连杆小端轴承
- (Piston Cooling)
- 齿轮传动机构
- 凸轮轴-轴承
- 摇臂轴-摇臂座
- 增压器转子-轴承
- 活塞环-气缸套

Circulating Oil



• 曲轴箱油循环

01-机带滑油泵

02-电动滑油泵(预润滑油泵)

03-滑油冷却器

04-恒温阀

05-自清滤器

06-离心滤器

07-调压阀

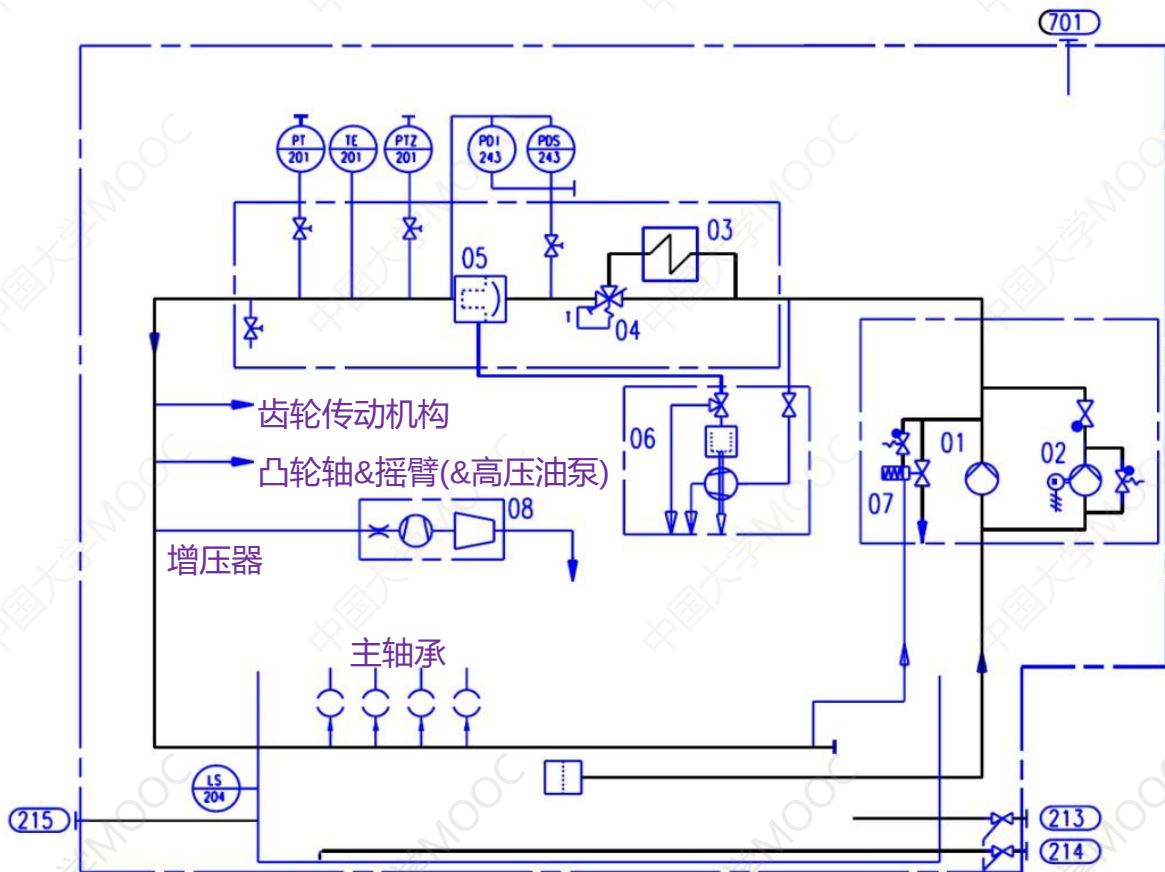
08-增压器

213-滑油进口(自分油机或贮藏柜)

214-滑油出口(至分油机或泄放舱)

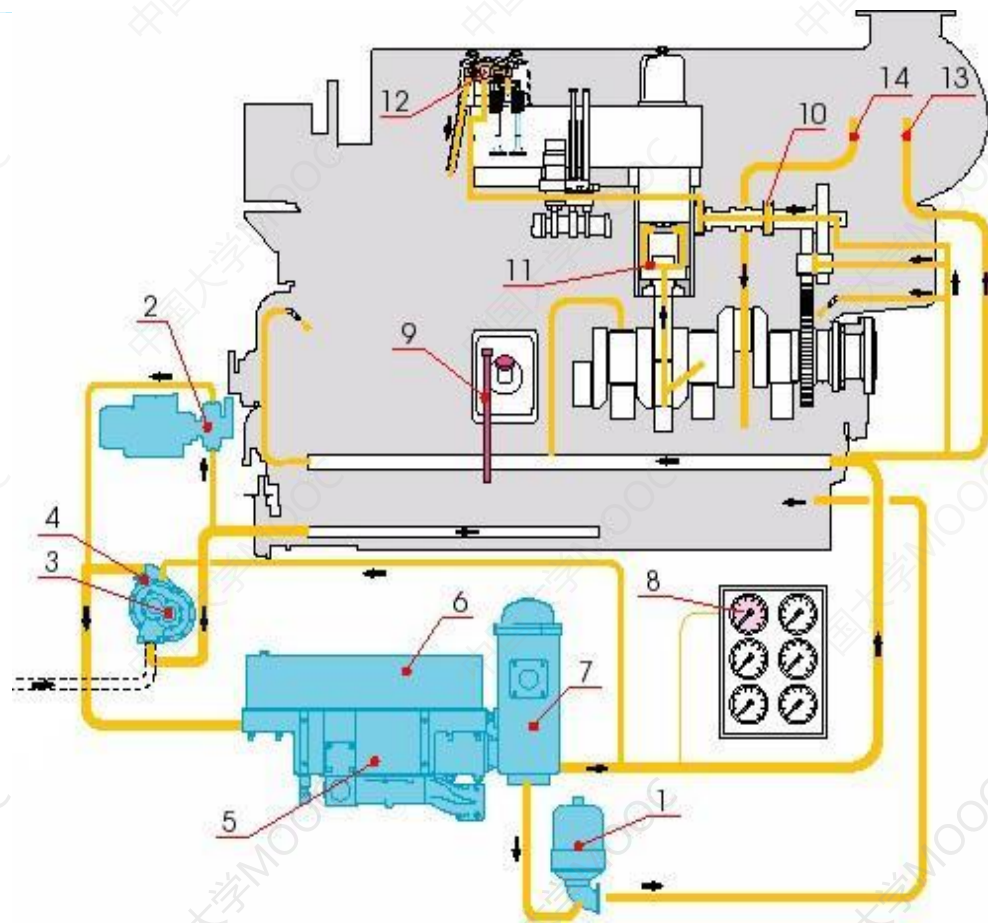
215-加油口

701-透气口

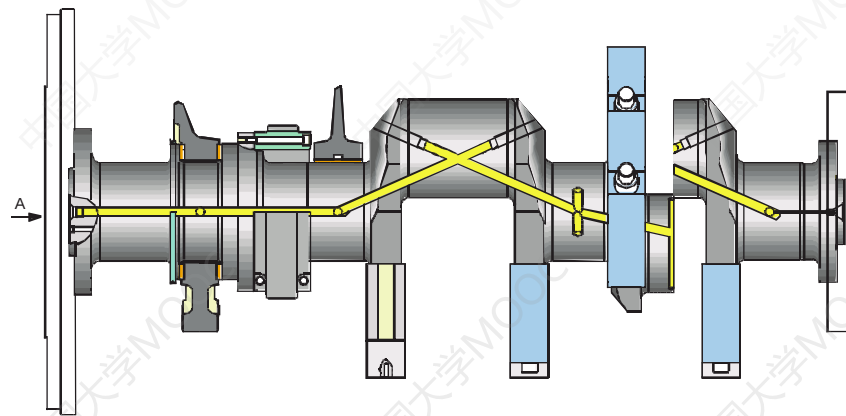
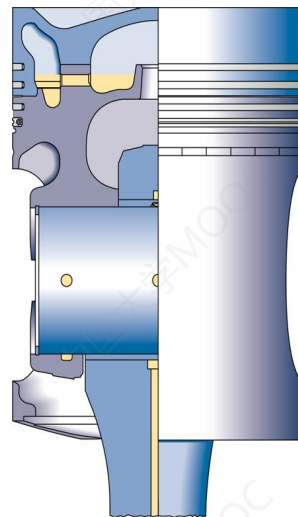
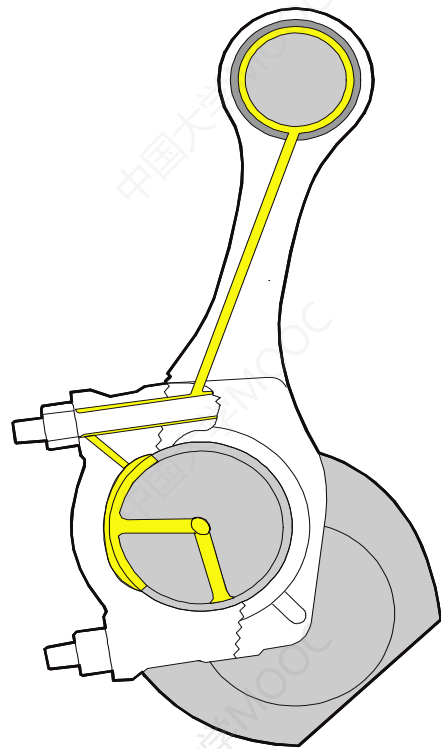


• 曲轴箱油循环

- 1-Centrifugal filter离心滤器
- 2-Prelubricating oil pump电动滑油泵
- 3-Lubrication oil pump机带滑油泵
- 4-Pressure regulating valve调压阀
- 5-Thermostat valve恒温阀
- 6-Lubrication oil cooler滑油冷却器
- 7- Lubrication oil filter自清滤器
- 8-Pressure gauge压力表
- 9-Oil dipstick量油尺
- 10-Camshaft bearings凸轮轴轴承
- 11-Gudgeon pins活塞销
- 12-Rocker arm bearings摇臂轴承
- 13-Lubrication oil pipe to T/C至增压器
- 14-Lubrication oil pipe from T/C增压器回

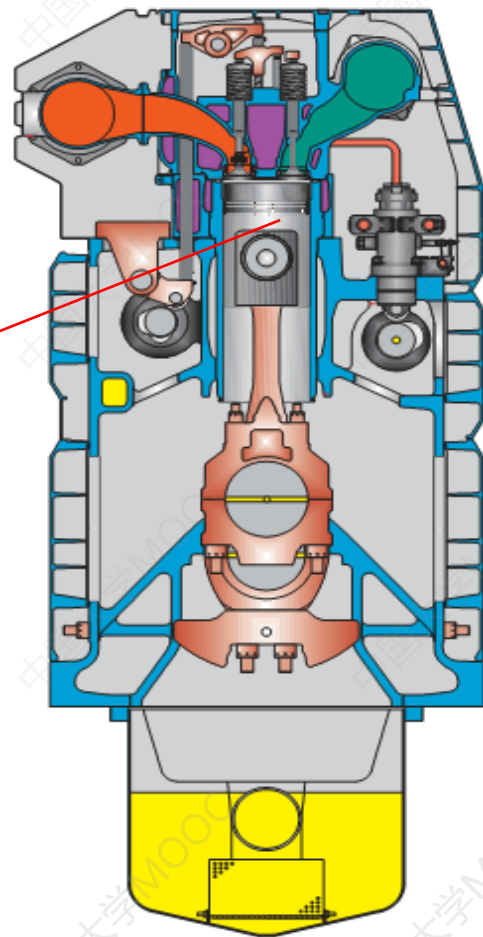
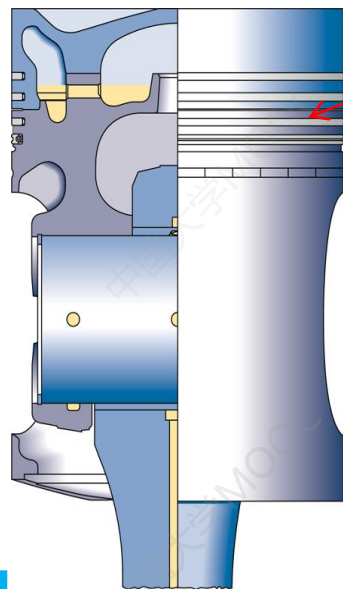


- 轴承润滑+活塞冷却



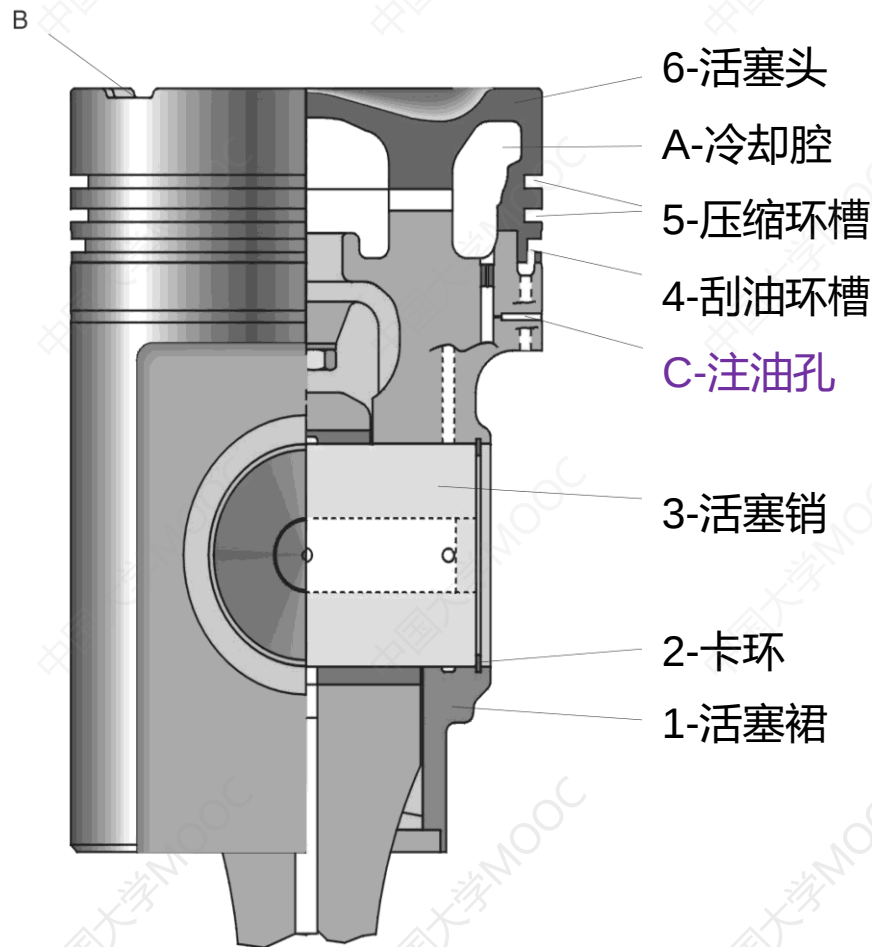
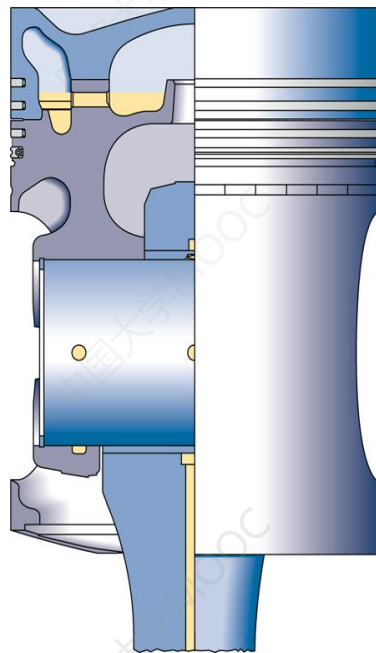
• 活塞环-气缸套

- 飞溅润滑: 高速旋转的连杆大端将大端轴承间隙漏出、冷却完活塞滴落到大端表面的润滑油甩溅至活塞环-气缸套之间实现润滑



• 活塞环-气缸套

○ 飞溅润滑+注油润滑

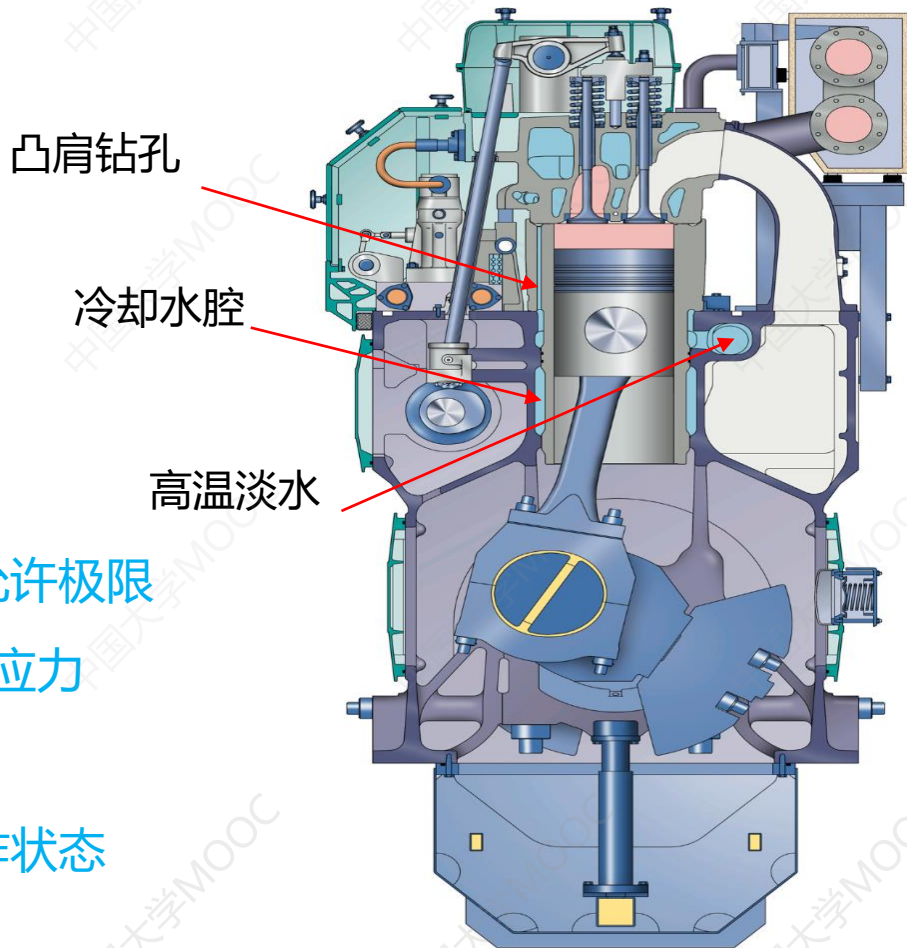


- 燃烧室部件

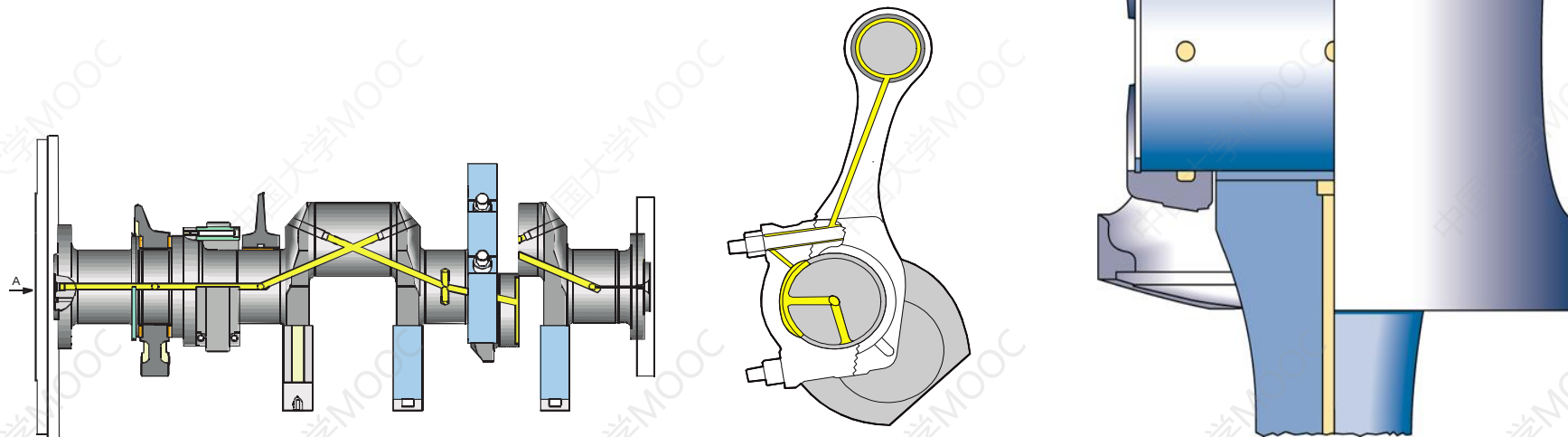
- 活塞
- 气缸套
- 气缸盖

- 柴油机冷却

- 限制部件工作温度不超过材料允许极限
- 限制部件内外壁面温差, 减少热应力
- 保证运动部件的适当间隙
- 保持部件表面滑油油膜正常工作状态



- 活塞冷却: 振荡-循环冷却
 - 来自曲轴-连杆-活塞销的润滑油



※ Engine Cooling

- 气缸套&气缸盖: 强制液体冷却
 - 高温淡水

