Action code: WHEN CONVENIENT

Guiding overhaul intervals

Updated tables

Replaces SL2017-650/SRJ

SL2019-681/SRJ
September 2019

Concerns

Owners and operators of MAN B&W two-stroke, low speed, marine engines. Type: ME/ME-C, ME-B, LGIM, LGIP, GIE and GI

Summary

Guiding overhaul intervals and expected service life of engine components on two-stroke low speed engines. This Service Letter replaces SL2017-650/SRJ except for MC/MC-C engines.

Dear Sir or Madam

Based on the latest service experience and engine development we are pleased to issue a revised version of the guiding overhaul intervals tables. The guiding overhaul intervals apply to electronically controlled ME and dual fuel type engines.

Longer overhaul intervals can be obtained with a condition-based overhaul strategy. The means to obtain and document this are described in SL07-483/HRR.

In addition, it must be noted that the application of, for example, WHR, EGB, EGR and SCR will affect the heat load on the combustion chamber components. Similarly, a more frequent heavy propeller running, caused by the Energy Efficiency Design Index (EEDI) condition, and the Adverse Weather Condition (AWC) software can have an influence. The above factors as well as fuel qualities and slow steaming may have an impact on the overhaul intervals of especially, but not exclusively, components affected by the cylinder condition and combustion chamber parts.

All stated overhaul intervals are total engine running hours regardless of fuel type (HFO, MGO or gas).

Please direct any inquiries and questions regarding the overhaul tables and condition-based overhaul to the:

Operation Department: Operation2S@man-es.com, or
PrimeServ Service Department: dt-cph@man-es.com.

Yours faithfully

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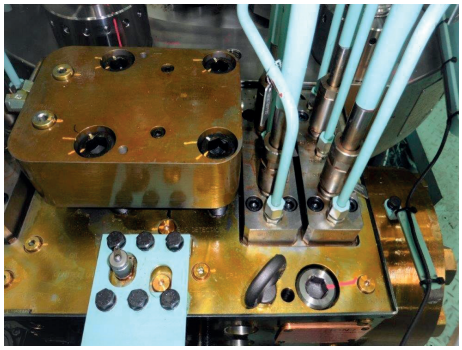

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ME-C methanol (LGIM) and LPG (LGIP) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Cylinder liner	Bore sizes 60-50 16,000	Bore sizes 60-50 60,000	Port inspection monthly. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation.
Piston rings	Bore sizes 60-50 16,000	Bore sizes 60-50 16,000	Piston rings to be renewed at each piston overhaul. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation. Cermet-coated piston rings are to be replaced according to the prevailing Service Letter covering cermet coating overhaul criteria (new SL will be released in 2019).
Piston crown	Bore sizes 60-50 16,000	Bore sizes 60-50 60,000	Pressure test at every second piston overhaul. Recondition/rechrome as required (typically every 1-2 piston ring overhaul). Piston crown can be reconditioned by welding-up twice.
Stuffing box	Bore sizes 60-50 16,000 Check gab of lamellas and sealing rings.	Bore sizes 60-50 32,000 Renew lamellas and sealing.	Overhaul follows the piston rings overhaul but can be extended based on observations.
Exhaust valve spindle and bottom piece	Bore sizes 60 Initial inspections[1] 6,000 & 12,000 Subsequent inspections[2] 24,000 50 Initial inspections[1] 4,000 & 8,000 Subsequent inspections[2] 16,000	Bore sizes 60 96,000 50 64,000	[1] Initial inspection Condition check of air spring according to the instruction manual. Inspection of seats. Maximum burn-off rate of spindle disc underside to be calculated for lifetime of spindle. Time for subsequent inspection for overhaul and recondition to be planned. Minimum two valves must be inspected. [2] Subsequent inspections Complete overhaul of exhaust valve. To obtain the spindle lifetime given, all spindle types can be reconditioned by welding-up 3 times. For bottom piece seats, only light grinding is usually required at subsequent inspections.
Exhaust actuator Non-return valve	24,000	64,000 12,000	Lifetime can deviate due to cavitation. Replace the non-return valve every 12,000 hours.
Exhaust valve high-pressure pipe	24,000	64,000	Lifetime can deviate due to cavitation.
Main hydraulic pump	48,000	96,000	Check and replace hydrostatic bearings during overhaul. Check and replace cylinder set and piston if required.
Proportional valve for main hydraulic pump		32,000	Replace

ME-C methanol (LGIM) and LPG (LGIP) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Hydraulic start-up pump		96,000	
Coupling/spider	6,000	32,000	Condition-based replacement.
Bearings	32,000		Replace bearings
Pressure relief valve for main hydraulic pumps	48,000	96,000	Replace sealings during overhaul.
FIVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
ELVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
ELFI	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
PEVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
Standard fuel oil valves without guide rings	4,000 depending on fuel quality	Valve nozzle 8,000 Spindle guide 8,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Holder 32,000 Head 32,000	Check components and replace if required. Change O-rings. For fuel oil valves tightened by torque (without spring packs): Clean threads on studs and ensure smooth operation of nut – otherwise replace nut and/or fuel oil valve stud.
Fuel oil valve design with guide rings	4,000 depending on fuel quality	Valve nozzle 8,000 Spindle guide 8,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Guide rings 16,000 Back-up ring 16,000 Holder 48,000 Head 48,000	Check components and replace if required. Change O-rings, back-up ring and guide rings.
Fuel oil pressure booster	32,000 based on engine observations	Replace or recondition 64,000	Change sealing rings on hydraulic piston and suction valve at overhaul.
Fuel oil booster	inspection of seat and spring	32,000	
throttle valve	16,000		
Suction valve	8,000	16,000	Check for wear on seat and conical ring.
High-pressure fuel pipe	Visual inspection when dismantled.	64,000	Change sealing rings when dismantled.
Fuel booster injection valve (FBIV)	16,000 based on engine observations	64,000	Check and replace if required. Visual inspection and pressure test for tightness.
Valve nozzle	4,000	8,000	Clean holes if required.
Suction valve	8,000	16,000	Check for wear on seat.
Spindle guide	8,000	16,000	Check for wear on seat and shaft.
LDCL pump seals		32,000	Change seals if required.

ME-C methanol (LGIM) and LPG (LGIP) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Cylinder cover	Check first and second fuel valves as well as staring air valve holes when valves are dismantled.	96,000	Check for burnt grooves at fuel oil valve nozzle holes. Max. 2 mm grinding in valve holes. Measuring tool can be purchased via PrimeServ. Weld-up if required, up to 2-3 times during service life.
Starting valve Pilot valve	16,000 32,000	96,000 64,000	Replace parts if required.
Cylinder lubricator	3000 32,000	96,000	Check non-return valve and replace it if leaking. Overhaul at an authorised MAN Energy Solutions workshop.
Crosshead bearings Main bearings Crank bearings Thrust bearings	Check clearances and crankshaft deflection once a year. Check bearing edges by wire gauges once a year.	64,000 96,000 96,000 96,000	Do not open bearings unless bearing material fragments fall out or other bearing inspection measures indicate so.
Stay bolts	Tighten bolts: First inspection 500 Subsequent inspections 32,000	Engine lifetime	Typically done at 5-year docking.
Holding down bolts	Tighten bolts: First inspection 500 Second inspection 1,000 Third inspection 1,500 Fourth inspection 4,000 Fifth inspection 8,000 Subsequent inspections 16,000	Engine lifetime	
Turbocharger	According to manufacturer's recommendations.	According to manufacturer's recommendations.	According to manufacturer's recommendations.
Air cooler(s)	Cleaning based on engine observations.	48,000 or according to manufacturer's recommendations	Clean before differential pressure has increased 50% compared to sea trial value.
Flaps and butterfly valves in scavenge air receiver	Check movement at every scavenge port inspection.	48,000	Periods with slow steaming may reduce lifetime.
Various fuel and lubricating oil filters	Cleaning based on engine observations.		
Lubricating oil bottom tank	Cleaning 32,000		Typically done at 5 years docking.
Chains	Retighten chains 3,000-4,000 every six months	96,000	New or overhauled chains to be checked/re-tightened after 500, 1,500 hours.
Gear wheel drive for hydraulic pumps	First inspection 500 Subsequent inspections 6,000	Gear wheel Engine lifetime Gear wheel bearings 96,000	
Accumulators on HPS and HCU	N_2 pressure 2,000 Rubber diaphragms 32,000	Engine lifetime	Replace diaphragms after 5 years.
Hydraulic safety block	Cartridge valves - change O-rings 32,000	Cartridge valves 96,000 Solenoid valve 64,000	Check and adjust safety valve if required after 32,000 hrs.

ME-C methanol (LGIM) and LPG (LGIP) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)		Expected service life (hours)		Remarks
Hydraulic hoses				32,000	Replace after 5 years.
MPC, MOP A, MOP B	Visual inspection	6,000		64,000	Replace if failing
Angle encoder	Visual inspection	6,000		64,000	Replace if failing
Angle encoder amplifiers	Visual inspection	6,000		64,000	Replace if failing
Fuel booster sensor	Visual inspection	6,000		64,000	Replace if failing
Exhaust valve sensor	Visual inspection	6,000		64,000	Replace if failing
Marker sensor	Visual inspection	6,000		64,000	Replace if failing
Cables	Visual inspection	6,000		96,000	Replace if failing
FIVA/ELFI safety screen strainer	Visual inspection	6,000		64,000	Replace if failing
Control oil pipe arrangement Non-return valve		32,000 16,000	Engine lifetime Replace or overhaul	 32,000	Replace static O-rings at overhaul. Check spring and seat.
Window valve High-pressure gas seal Soft iron ring		16,000 8,000		32,000 16,000	Pressure and function test. Replace if required and at overhaul. Replace soft iron ring when dismantled.
Sealing oil pump N_2 accumulator filter Spider/coupling Proportional valve	N_2 pressure Rubber diaphragms	2,000 32,000 6,000 32,000		96,000 32,000	 Replace diaphragms after 5 years. Condition-based replacement. Replace
LPS booster pump seals				32,000	Change seals when required.
Blow-off valve		32,000		64,000	
Purge valve		32,000		64,000	
Resume valve		32,000		64,000	
ELWI		32,000		64,000	
ELGI		32,000		64,000	
Gas channel pressure sensor				64,000	Replace if failing
Chain pipe		32,000		64,000	Inspect the supports for the inner pipes. Check for oil in the outer pipe and drain in case of a no-flow alarm in the outer pipe.
Gas block Non-return valve Accumulator	 N_2 pressure	 8,000 2,000	Engine lifetime		Check in situ for gas tightness. Replace diaphragm after 5 years.

ME-C methane (GI) and ethane (GIE) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Cylinder liner	Bore sizes 95-80 24,000 70-50 16,000 45-40 12,000	Bore sizes 95-90 80,000 80-65 70,000 60-50 60,000 45-40 50,000	Port inspection monthly. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation.
Piston rings	Bore sizes 95-80 24,000 70-50 16,000 45-40 12,000	Bore sizes 95-80 24,000 70-50 16,000 45-40 12,000	Piston rings to be renewed at each piston overhaul. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation. Cermet-coated piston rings are to be replaced according to the prevailing Service Letter covering cermet coating overhaul criteria (new SL will be released in 2019).
Piston crown	Bore sizes 95-80 24,000 70-50 16,000 45-40 12,000	Bore sizes 95-90 80,000 80-65 70,000 60-50 60,000 45-40 50,000	Pressure test at every second piston overhaul. Recondition/rechrome as required (typically every 1-2 piston ring overhaul). Piston crown can be reconditioned by welding-up twice.
Stuffing box	Bore sizes 95-80 24,000 70-50 16,000 45-40 12,000 Check gab of lamellas and sealing rings.	Bore sizes 95-80 48,000 70-50 32,000 45-40 24,000 Renew lamellas and sealing rings.	Overhaul follows the piston rings overhaul but can be extended based on observations.
Exhaust valve spindle and bottom piece	Bore sizes 95-60 Initial inspection[1] 6,000 & 12,000 Subsequent inspections[2] 24,000 50-40 Initial inspection[1] 4,000 & 8,000 Subsequent inspections[2] 16,000	Bore sizes 95-60 96,000 50-40 64,000	[1] Initial inspection Condition check of air spring according to the instruction manual. Inspection of seats. Maximum burn-off rate of spindle disc underside to be calculated for lifetime of spindle. Time for subsequent inspection for overhaul and recondition to be planned. Minimum two valves to be inspected. [2] Subsequent inspections Complete overhaul of exhaust valve. To obtain the spindle lifetime given, all spindle types can be reconditioned by welding-up 3 times. For bottom piece seats: only light grinding is usually required at subsequent inspections.
Exhaust actuator Non-return valve	24,000	64,000 12,000	Lifetime can deviate due to cavitation. Replace the non-return valve every 12,000 hours.
Exhaust valve high-pressure pipe	24,000	64,000	Lifetime can deviate due to cavitation.

ME-C methane (GI) and ethane (GIE) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Main hydraulic pump	48,000	96,000	Check and replace hydrostatic bearings during overhaul. Check and replace cylinder set and piston if required.
Proportional valve for main hydraulic pump		32,000	Replace
Hydraulic start-up pump Coupling/spider Bearings	 6,000 32,000	96,000 32,000	 Condition-based replacement. Replace bearings
Pressure relief valve for main hydraulic pumps	48,000	96,000	Replace sealings during overhaul.
FIVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
ELVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
ELFI	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
PEVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
Standard fuel oil valves without guide rings	4,000 depending on fuel quality	Valve nozzle 8,000 Spindle guide 8,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Holder 32,000 Head 32,000	Check components and replace if required. Change O-rings. For fuel oil valves tightened by torque (without spring packs): Clean threads on studs and ensure smooth operation of nut – otherwise replace nut and/or fuel oil valve stud.
Fuel oil valve design with guide rings	4,000 depending on fuel quality	Valve nozzle 8,000 Spindle guide 8,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Guide rings 16,000 Back-up ring 16,000 Holder 48,000 Head 48,000	Check components and replace if required. Change O-rings, back-up ring and guide rings.
Fuel oil pressure booster	32,000 based on engine observations	Replace or recondition 64,000	Change sealing rings on hydraulic piston and suction valve at overhaul.
Fuel oil booster throttle valve	Inspection of seat and spring. 16,000	32,000	
Suction valve	8,000	16,000	Check for wear on seat and conical ring.
High-pressure fuel pipe	Visual inspection when dismantled.	64,000	Change sealing rings when dismantled.

ME-C methane (GI) and ethane (GIE) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Fuel booster injection valve (FBIV)			Check and replace if required.
Fuel valve parts	8,000		
- nozzle		16,000	Clean nozzle holes if required.
- spindle guide		16,000	Replace sealing rings.
- non-return valve		16,000	Check for wear on seat and shaft.
- spring		16,000	
- thrust spindle		32,000	
- holder		32,000	Check for wear on seat.
- union unit		32,000	
Fuel booster parts	16,000		
- suction valve		32,000	
- top cover		64,000	
- return oil orifice		32,000	
- plunger/barrel		32,000	
Sleeve	16,000	64,000	
Gas injection valve (GIV)	16.000	32.000	Check and replace if required. Visual inspection and pressure test for tightness.
Valve nozzle	4.000	8.000	Clean nozzle holes if required.
LDCL pump seals		32,000	Change seals if required.
Cylinder cover	Check first and second fuel valves as well as staring air valve holes when valves are dismantled.	96,000	Check for burnt grooves at fuel oil valve nozzle holes. Max. 2 mm grinding in valve holes. Measuring tool can be purchased via PrimeServ. Weld-up if required, up to 2-3 times during service life.
Starting valve	16,000	96,000	
Pilot valve	32,000	64,000	Replace parts if required.
Cylinder lubricator	3,000 32,000	96,000	Check non-return valve and replace it if leaking. Overhaul at an authorised MAN Energy Solutions workshop.
Crosshead bearings Main bearings Crank bearings Thrust bearings	Check clearances and crankshaft deflection once a year. Check bearing edges by wire gauges once a year.	64,000 96,000 96,000 96,000	Do not open bearings unless bearing material fragments fall out or other bearing inspection measures indicate so.
Stay bolts	Tighten bolts: First inspection 500 Subsequent inspections 32,000	Engine lifetime	Typically done at 5-year docking.
Holding down bolts	Tighten bolts: First inspection 500 Second inspection 1,000 Third inspection 1,500 Fourth inspection 4,000 Fifth inspection 8,000 Subsequent inspections 16,000	Engine lifetime	

ME-C methane (GI) and ethane (GIE) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Turbocharger	According to manufacturer's recommendations.	According to manufacturer's recommendations.	According to manufacturer's recommendations.
Air cooler(s)	Cleaning: based on engine observations.	48,000 or according to manufacturer's recommendations	Clean before differential pressure has increased 50% compared to sea trial value.
Flaps and butterfly valves in scavenge air receiver	Check movement at every scavenge port inspection.	48,000	Periods with slow steaming may reduce lifetime.
Various fuel and lubricating oil filters	Cleaning based on engine observations.		
Lubricating oil bottom tank	Cleaning 32,000		Typically done at 5 years docking.
Chains	Retighten chains 3,000-4,000 every six months	96,000	New or overhauled chains to be checked/re-tightened after 500, 1,500 hours.
Gear wheel drive for hydraulic pumps	First inspection 500 Subsequent inspections 6,000	Gear wheel Engine lifetime Gear wheel bearings 96,000	
Accumulators on HPS and HCU	N_2 pressure 2,000 Rubber diaphragms 32,000	Engine lifetime	Replace diaphragms after 5 years.
Hydraulic safety block Cartridge valves Solenoid valve	Change O-rings 32,000	96,000 64,000	Check and adjust safety valve if required after 32,000 hrs.
Hydraulic hoses		32,000	Replace after 5 years.
MPC, MOP A, MOP B	Visual inspection 6,000	64,000	Replace if failing
Angle encoder	Visual inspection 6,000	64,000	Replace if failing
Angle encoder amplifiers	Visual inspection 6,000	64,000	Replace if failing
Fuel booster sensor	Visual inspection 6,000	64,000	Replace if failing
Exhaust valve sensor	Visual inspection 6,000	64,000	Replace if failing
Marker sensor	Visual inspection 6,000	64,000	Replace if failing
Cables	Visual inspection 6,000	96,000	Replace if failing
FIVA/ELFI safety screen strainer	Visual inspection 6,000	64,000	Replace if failing
Control oil pipe arrangement Non-return valve	32,000 16,000	Engine lifetime Replace or overhaul 32,000	Replace static O-rings at overhaul. Check spring and seat.
Window valve High-pressure gas seal Soft iron ring	16,000 8,000	32,000 16,000	Pressure and function test. Replace if required. Replace seals at overhaul. Replace soft iron ring when dismantled.
Sealing oil pump N_2 accumulator filter Spider/coupling Proportional valve	N_2 pressure 2,000 Rubber diaphragms 32,000 6,000 32,000	96,000 32,000	Replace diaphragms after 5 years. Condition-based replacement. Replace.

ME-C methane (GI) and ethane (GIE) engines
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
LPS booster pump seals		32,000	Change seals when required.
Blow-off valve	32,000	64,000	
Purge valve	32,000	64,000	
Resume valve	32,000	64,000	
ELWI	32,000	64,000	
ELGI	32,000	64,000	
Gas channel pressure sensor		64,000	Replace if failing
Chain pipe	32,000	64,000	Inspect the supports for the inner pipes. Check for oil in the outer pipe and drain in case of a no-flow alarm in the outer pipe.
Gas block Non-return valve Accumulator	 8,000 N_2 pressure 2,000	Engine lifetime	Check in situ for gas tightness. Replace diaphragm after 5 years.

ME/ME-C engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Cylinder liner	Bore sizes 98-80 24,000 70-50 16,000 45-40 12,000	Bore sizes 98-90 80,000 80-65 70,000 60-50 60,000 45-40 50,000	Port inspection monthly. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation.
Piston rings	Bore sizes 98-80 24,000 70-50 16,000 45-40 12,000	Bore sizes 98-80 24,000 70-50 16,000 45-40 12,000	Renew at each piston overhaul. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation. Cermet-coated piston rings are to be replaced according to the prevailing Service Letter covering cermet coating overhaul criteria (new SL will be released in 2019).
Piston crown	Bore sizes 98-80 24,000 70-50 16,000 45-40 12,000	Bore sizes 98-90 80,000 80-65 70,000 60-50 60,000 45-40 50,000	Pressure test at every 2nd piston overhaul and recondition/rechrome as required (typically every 1-2 piston overhall). Piston crown can be reconditioned by welding-up twice.
Stuffing box	Bore sizes 98-80 24,000 70-50 16,000 45-40 12,000 Check gab of lamellas and sealing rings.	Bore sizes 98-90 48,000 80-65 32,000 45-40 24,000 Renew lamellas and sealing rings.	Overhaul follows the overhaul of piston rings, but can be extended based on observations.
Exhaust valve spindle and bottom piece	Bore sizes 98-60 Initial inspections[1] 6,000 & 12,000 Subsequent inspections[2] 24,000 Bore sizes 50-35 Initial inspections[1] 4,000 & 8,000 Subsequent inspections[2] 16,000	Bore sizes 95-60 96,000 50-35 64,000	[1] Initial inspection Condition check of air spring according to the instruction manual. Inspection of seats. Maximum burn-off rate of spindle disc underside to be calculated for lifetime of spindle. Time for subsequent inspection for overhaul and recondition to be planned. Minimum two valves to be inspected. [2] Subsequent inspections Complete overhaul of exhaust valve. To obtain the spindle lifetime given, all spindle types can be reconditioned by welding-up 3 times. For bottom piece seats: only light grinding is usually required at subsequent inspections.
Exhaust actuator Non-return valve	24,000	64,000 12,000	Lifetime can deviate due to cavitation. Replace after 12,000 hours.
Exhaust valve high-pressure pipe	24,000	64,000	Lifetime can deviate due to cavitation.

ME/ME-C engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Main hydraulic pump	48,000	96,000	Check and replace hydrostatic bearings at overhaul. Check and replace cylinder set and piston if required.
Proportional valve for main hydraulic pump		32,000	Replace
Hydraulic start-up Pump Coupling/spider Bearings	 6,000 32,000	96,000 32,000	 Condition based replacement. Replace bearings.
Pressure relief valve for main hydraulic pumps	48,000	96,000	Replace sealings at overhaul.
FIVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
ELVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
ELFI	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
PEVA	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
Standard fuel oil valves without guide rings	8.000 depending on fuel quality	Valve nozzle 16,000 Spindle guide 16,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Holder 32,000 Head 32,000	Check components and replace if required. Change O-rings. For fuel oil valves tightened by torque (without spring packs): clean threads on studs and ensure smooth operation of nut – otherwise replace nut and/or fuel oil valve stud.
Fuel oil valve design with guide rings	8,000 depending on fuel quality	Valve nozzle 16,000 Spindle guide 16,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Guide rings 16.000 Back-up ring 16,000 Holder 48,000 Head 48,000	Check components and replace if required. Change O-rings, back-up ring and guide rings.
Fuel oil pressure booster Suction valve	32,000 based on engine observations 8,000	64,000 replace or recondition 16,000	Change sealing rings on hydraulic piston and suction valve at overhaul. Check for wear at seat and conical ring.
High-pressure fuel pipe	Visual inspection when dismantled.	64,000	Change sealing rings when dismantled.

ME/ME-C engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Fuel booster injection valve (FBIV)			Check and replace if required.
Fuel valve parts	8,000		
- nozzle		16,000	Clean nozzle holes if required.
- spindle guide		16,000	Replace sealing rings.
- non-return valve		16,000	Check for wear on seat and shaft.
- spring		16,000	
- thrust spindle		32,000	
- holder		32,000	Check for wear on seat.
- union unit		32,000	
Fuel booster parts	16,000		
- suction valve		32,000	
- top cover		64,000	
- return oil orifice		32,000	Check top cover orifice and replace if worn out.
- plunger/barrel		32,000	
Sleeve	16,000	64,000	
LDCL pump seals		32,000	Change seals if required.
Cylinder cover	Check holes for fuel valves and starting air valve when valves are dismantled.	96,000	Check for burnt grooves at fuel oil valve nozzle holes. Max. 2 mm grinding in valve holes. Measuring tool can be purchased via PrimeServ. Weld-up if required, up to 2-3 times during service life.
Starting valve	16,000	96,000	
Pilot valve	32,000	64,000	Replace parts if required.
Cylinder lubricator	3,000 32,000	96,000	Check non-return valve and replace it if leaking. Overhaul at an authorised MAN Energy Solutions workshop.
Crosshead bearings Main bearings Crank bearings Thrust bearings	Check clearances and crankshaft deflection once a year. Check bearing edges by wire gauges once a year.	64,000 96,000 96,000 96,000	Do not open bearings unless bearing material fragments fall out or other bearing inspection measures indicate so.
Stay bolts	Tighten bolts: First inspection 500 Subsequent inspections 32,000	Engine lifetime	Typically done at 5-year docking.
Holding down bolts	Tighten bolts: First inspection 500 Second inspection 1,000 Third inspection 1,500 Fourth inspection 4,000 Fifth inspection 8,000 Subsequent inspections 16,000	Engine lifetime	
Turbocharger	According to manufacturer's recommendations.	According to manufacturer's recommendations.	According to manufacturer's recommendations.

ME/ME-C engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Air cooler(s)	Cleaning: based on engine observations.	48,000 or according to manufacturer's recommendations	Clean before differential pressure has increased 50% compared to sea trial value.
Flaps and butterfly valves in scavenge air receiver	Check movement at every scavenge port inspection.	48,000	Periods with slow steaming may reduce lifetime.
Various fuel and lubricating oil filters	Cleaning based on engine observations.		
Lubricating oil bottom tank	Cleaning 32,000		Typically done at 5 years docking.
Chains	Retighten chains 3,000-4,000 every six months	96,000	New or overhauled chains to be checked/re-tightened after 500, 1,500 hours.
Gear wheel drive for hydraulic pumps	First inspection 500 Subsequent inspections 6,000	Gear wheel Engine lifetime Gear wheel bearings 96,000	
Accumulators on HPS and HCU	N_2 pressure 2,000 Rubber diaphragms 32,000	Engine lifetime	Replace diaphragms after 5 years.
Hydraulic safety block Cartridge valves Solenoid valve	Change O-rings 32,000	96,000 64,000	Check and adjust safety valve if required after 32,000 hrs.
Hydraulic hoses		32,000	Replace after 5 years.
MPC, MOP A, MOP B	Visual inspection 6,000	64,000	Replace if failing
CCU and ACU amplifiers	Visual inspection 6,000	64,000	Replace if failing
LVDT and LDI hydraulic pump amplifiers	Visual inspection 6,000	64,000	Replace if failing
Fuel booster sensor	Visual inspection 6,000	64,000	Replace if failing
Exhaust valve sensor	Visual inspection 6,000	64,000	Replace if failing
Angle encoder	Visual inspection 6,000	64,000	Replace if failing
Marker sensor	Visual inspection 6,000	64,000	Replace if failing
Cables	Visual inspection 6,000	96,000	Replace if failing
FIVA/ELFI safety screen strainer	Visual inspection 6,000	64,000	Replace if failing

ME-B engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Cylinder liner	Bore sizes 60-50 16,000 46-30 12,000	Bore sizes 60-50 60,000 46-30 50,000	Port inspection monthly. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation.
Piston rings	Bore sizes 60-50 16,000 46-30 12,000	Bore sizes 60-50 16,000 46-30 12,000	Renew piston rings at each piston overhaul. Wear rate according to fuel type and treatment, cylinder oil type/feed rate and engine operation. Cermet-coated piston rings are to be replaced according to the prevailing Service Letter covering cermet coating overhaul criteria (new SL will be released in 2019).
Piston crown	Bore sizes 60-50 16,000 46-40 12,000 35-30 10,000	Bore sizes 60-46 60,000 46-40 50,000 35-30 30,000	Pressure test at every 2nd piston overhaul. Recondition/rechrome as required (typically every 1-2 piston ring overhaul). Piston crown can be reconditioned by welding-up twice.
Stuffing box	Bore sizes 60-50 16,000 46-30 12,000 Check gab of lamellas and sealing rings.	Bore sizes 60-50 32,000 46-30 24,000 Renew lamellas and sealing rings.	Overhaul follows the piston rings overhaul but can be extended based on observations.
Exhaust valve spindle and bottom piece	Bore sizes 60-35 Initial inspections[1] 4,000 & 8,000 50-35 Subsequent inspections[2] 16,000 60 Subsequent inspections[2] 24,000	Bore size 60 96,000 50-35 64,000	[1] First inspection Condition check of air spring according to Instruction manual. Inspection of seats. Calculate the max. burn-off rate of spindle disc underside for lifetime of spindle. Plan the time for subsequent overhaul inspection and reconditioning. Minimum two valves must be inspected. [2] Subsequent inspections Complete overhaul of exhaust valve. To obtain a given lifetime, all spindle types can be reconditioned up to three times by welding. For bottom piece seats, only light grinding is usually required at subsequent inspections.
Exhaust actuator	32,000	96,000	
ELFI valve	32,000	64,000	Check and replace if required. Replace pilot valve after 32,000 hours.
Exhaust valve high-pressure pipe	32,000	96,000	
Main hydraulic pump	48,000	96,000	Check and replace hydrostatic bearings at overhaul. Check and replace cylinder set and piston if required.

ME-B engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Proportional valve for main hydraulic pump		32,000	Replace
Hydraulic pump Coupling/spider	 6,000	96,000	 Condition-based replacement.
Pressure relief valve for main hydraulic pumps	48,000	96,000	Replace sealings at overhaul.
Standard fuel oil valves without guide rings	8,000 depending on fuel quality	Valve nozzle 16,000 Spindle guide 16,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Holder 32,000 Head 32,000	Check components and replace if required. Change O-rings. For fuel oil valves tightened by torque (without spring packs): clean threads on studs and ensure smooth operation of nut – otherwise replace nut and/or fuel oil valve stud.
Fuel oil valve design with guide rings	8,000 depending on fuel quality	Valve nozzle 16,000 Spindle guide 16,000 Non-return valve 16,000 Spring 32,000 Thrust spindle 16,000 Foot 32,000 Spring pack 16,000 Guide rings 16,000 Back-up ring 16,000 Holder 48,000 Head 48,000	Check components and replace if required. Change O-rings, back-up ring and guide rings.
Fuel oil pressure booster Suction valve	32,000 based on engine observations 8,000	64,000 replace or recondition 16,000	Change sealing rings on hydraulic piston and suction valve at overhaul. Check for wear at seat and conical ring.
High-pressure fuel pipe	Visual inspection when dismantled.	64,000	Change sealing rings when dismantled.
LDCL pump seals		32,000	Change seals if required.
Cylinder cover	Check holes for fuel valves and starting air valve when valves are dismantled.	96,000	Check for burnt grooves at fuel oil valve nozzle holes. Max. 2 mm grinding in valve holes. Measuring tool can be purchased via PrimeServ. Weld-up if required, 2-3 times during service life.
Starting valve Pilot valve	16,000 32,000	96,000 64,000	 Replace parts if required.
Cylinder lubricator	3,000 32,000	96,000	Check non-return valve and replace it if leaking. Overhaul at an authorised MAN Energy Solutions workshop.
Crosshead bearings Main bearings Crank bearings Thrust bearings	Check clearances and crankshaft deflection once a year. Check bearing edges by wire gauges once a year.	64,000 96,000 96,000 96,000	Do not open bearings unless bearing material fragments fall out or other bearing inspection measures indicate so.

ME-B engines (diesel and HFO)
Guiding overhaul intervals and expected service life

Component	Overhaul interval (hours)	Expected service life (hours)	Remarks
Stay bolts	Tighten bolts: First inspection 500 Subsequent inspections 32,000	Engine lifetime	Typically done at 5-year docking.
Holding down bolts	Tighten bolts: First inspection 500 Second inspection 1,000 Third inspection 1,500 Fourth inspection 4,000 Fifth inspection 8,000 Subsequent inspections 16,000	Engine lifetime	
Turbocharger	According to manufacturer's recommendations.	According to manufacturer's recommendations.	According to manufacturer's recommendations.
Air cooler(s)	Cleaning based on engine observations.	48,000 or according to manufacturer's recommendations	Clean before differential pressure has increased 50% compared to sea trial value.
Flaps and butterfly valves in scavenge air receiver	Check movement at every scavenge port inspection.	48,000	Periods with slow steaming may reduce lifetime.
Various fuel and lubricating oil filters	Cleaning based on engine observations.		
Lubricating oil bottom tank	Cleaning 32,000		Typically done at 5 years docking.
Chains	Retighten chains 3,000-4,000 every six months	96,000	New or overhauled chains to be checked/re-tightened after 500, 1,500 hours.
Accumulators on HPS and HCU	N_2 pressure 2,000 Rubber diaphragms 32,000	Engine lifetime	Replace diaphragms after 5 years.
Hydraulic safety block Cartridge valves Solenoid valve	Change O-rings 32,000	96,000 64,000	Check and adjust safety valve if required after 32,000 hrs.
Hydraulic hoses		32,000	Replace after 5 years.
Angle encoder	Visual inspection 6,000	64,000	Replace if failing
Marker sensor	Visual inspection 6,000	64,000	Replace if failing
MPC, MOP A, MOP B	Visual inspection 6,000	64,000	Replace if failing
Cables	Visual inspection 6,000	96,000	Replace if failing
FIVA/ELFI safety screen strainer	Visual inspection 6,000	64,000	Replace if failing