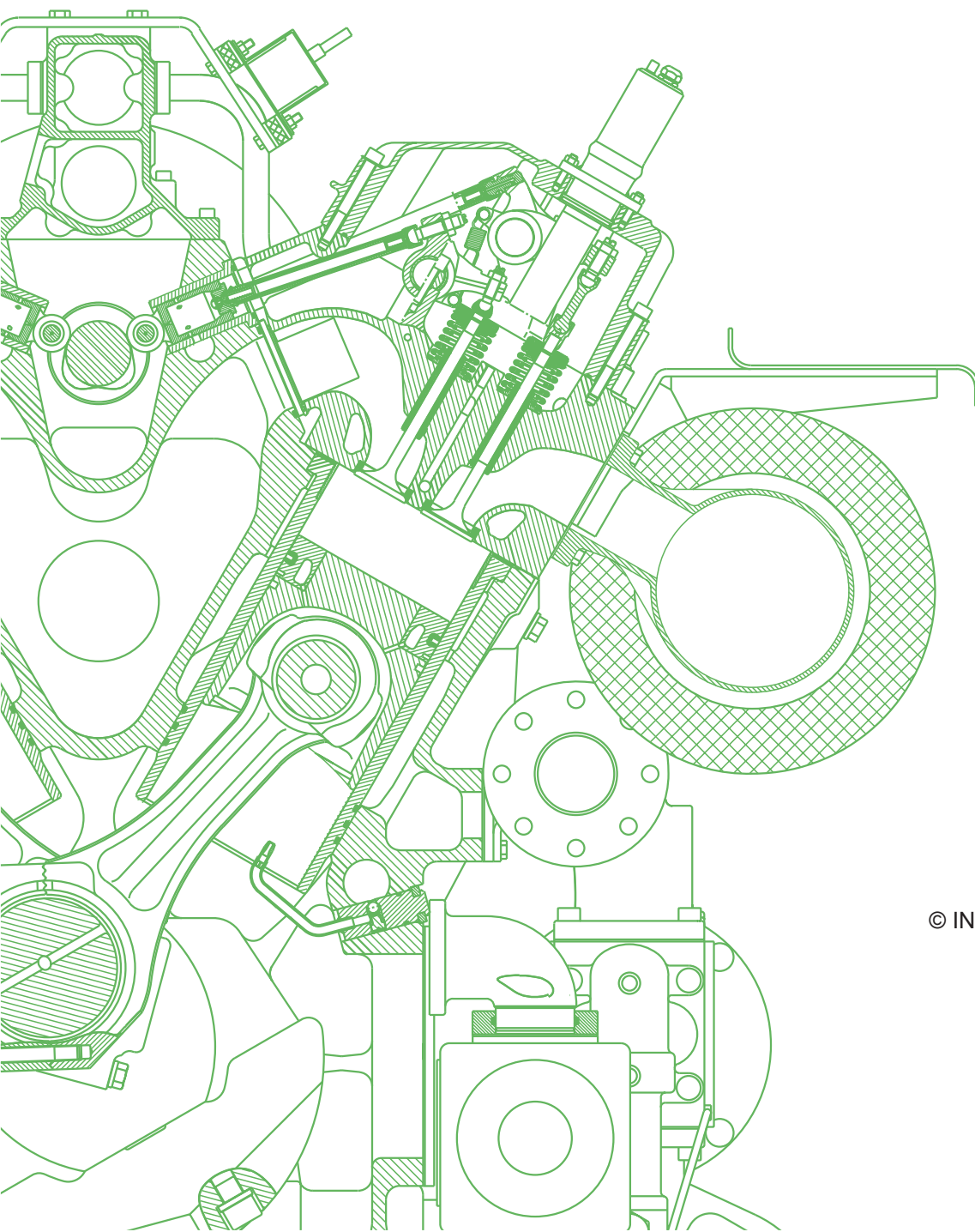




# Standard Maintenance schedule E Type 4



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**Maintenance instruction highlighted in green**

The maintenance instructions highlighted in green in the maintenance schedule are plant-specific and are incorporated into the customer-specific maintenance schedule according to engine type and version.

**Revision history**

Index	Date	Description / Revision summary	Expert Auditor
1	16/01/2020	First issue	<b>Technology</b> Technology

**The target recipients of this document are:**

Service partners, commissioning partners, subsidiaries/branches, Jenbach location

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**Note to warranty claims:**

Complying with TA 1100-0113 ensures a safe, quick and proper execution of every maintenance task.

The risk assessment to be performed by the plant operator and the official and quasi-official safety rules and laws may give rise to acceptance tests, inspections and maintenance operations which are not included in the Maintenance Plan. The operator is responsible for implementing and enforcing these additional measures.

The maintenance intervals are based on empirical values during average types of operation while fully complying with the manufacturer's operating and maintenance instructions. In individual cases, the operating conditions and other factors relating to wear may affect the actual amount of maintenance required. The manufacturer therefore reserves the right to specify different maintenance intervals where appropriate.

**NOTE****Damage to the engine**

Damage to the engine may result if the intervals in the maintenance schedule are not followed precisely. Observe intervals related to the condition and starts, or intervals not to the operating hours.

The maintenance instructions highlighted in colour in the maintenance schedule are plant-specific and are incorporated into the customer-specific maintenance schedule according to engine type and version.

inspect	Wear parts and tolerances will be evaluated by INNIO and / or a company selected and authorized by INNIO, and may be changed as required as part of preventive maintenance. Seals require replacement due to disassembly of components for inspection.
replace	Indicates a scheduled preventive part exchange based on operating hours, time or starts.
overhaul	Parts will be disassembled, overhauled (cleaned, wear parts changed etc.) and assembled again.
c (condition-based)	The inspect-, replace-, and overhaul interval is condition based.
s (start-dependent)	The inspect-, replace-, and overhaul interval is start dependent.
t (time-dependent)	The inspect-, replace-, and overhaul interval is time dependent.
z (Thermal cycle)	The inspection, replacement or overhaul interval depends on the thermal cycle. A thermal cycle is defined as heating up to operating temperature and then cooling down to a defined temperature for the component in question. If the operating temperature is reached again before cooling down to below the limit temperature has taken place, there is no thermal cycle.
K	This activity is to be carried out by the customer, INNIO or a company selected and authorised by INNIO to carry out this work.
INNIO	This activity is to be carried out by INNIO or a company selected by INNIO authorised to carry out this work.
WA	Reference for the maintenance instruction.
I	A maintenance instruction which contains only inspection working tasks.
W	A maintenance instruction which contains only replacement / overhaul working tasks.
IW	A maintenance instruction which contains inspection and replacement / overhaul working tasks.
Oh	Operating hours



The line in the maintenance plan after the maintenance <100 Oh is shown as thicker. This line marks the difference between one-off intervals or intervals not related to operating hours, and intervals which have to be repeated after a certain number of operating hours.

The detailed **description of the time-, start- and condition-based intervals** can be found in the chapter maintenance interval in the respective **maintenance instruction**.

If a maintenance step depends on two different factors, for example operating hours and starts, the maintenance step need only be carried out once when a limit value is reached. After the maintenance step has been carried out, both limit values start counting again from the beginning.

		c	t	s	< 100 Oh	every 1,000 Oh	1,000 Oh	2,000 Oh	3,333 Oh	4,000 Oh	6,000 Oh	6,666 Oh	8,000 Oh	10,000 Oh	12,000 Oh	13,333 Oh	14,000 Oh	16,000 Oh	16,666 Oh	18,000 Oh	20,000 Oh	22,000 Oh	23,333 Oh	24,000 Oh	26,000 Oh	26,666 Oh	28,000 Oh	30,000 Oh	31,000 Oh	32,000 Oh	33,333 Oh	34,000 Oh	36,000 Oh	36,666 Oh	38,000 Oh	40,000 Oh	42,000 Oh	43,333 Oh	44,000 Oh	46,000 Oh	46,666 Oh	48,000 Oh	50,000 Oh	52,000 Oh	53,333 Oh	54,000 Oh	56,000 Oh	56,666 Oh	58,000 Oh	60,000 Oh				
Grid Code	I 8030 0																																																					
⇒ Inspecting the generator, engine and building		■																																																				
⇒ Checking the coupling and voltage regulator		■																																																				
Daily inspection	I 9003 0																																																					
⇒ Inspecting the system			■																																																			
Leak test	IW 8049 0																																																					
⇒ Carrying out the leak test			■									■					■				■					■					■						■					■												
Inspection	I 0103 4																																																					
⇒ Checking engine connection in myPlant									■			■		■		■			■		■		■			■		■			■			■		■		■		■		■		■		■		■		■		■		■
⇒ Heat exchanger exhaust gas / water: Measuring the differential pressure									■			■		■		■			■		■		■			■		■			■			■		■		■		■		■		■		■		■		■		■		■
⇒ Crankcase ventilation: Measuring the differential pressure									■			■		■		■			■		■		■			■		■			■			■		■		■		■		■		■		■		■		■		■		■
⇒ Thermal reactor: Measuring the differential pressure												■				■					■					■				■				■				■			■			■			■			■		■		■
⇒ Flexibly-mounted coupling housing: Recording data												■				■					■					■				■				■				■			■			■			■			■		■		■
⇒ Heat exchanger mixture / water: Measuring the differential pressure														■							■								■							■					■				■				■		■		■	
Maintenance after initial commissioning	W 1000 4																																																					
⇒ Measuring the valve-stem projection					■																																																	
⇒ Checking valve clearance					■																																																	
⇒ Checking the ignition voltage					■																																																	
⇒ Checking the thermal reactor (optional)					■																																																	
⇒ Inspecting the flexibly-mounted coupling housing					■																																																	
⇒ Inspecting the gas filter					■																																																	
⇒ Lubricating the control rod linkage					■																																																	
Surge arrester in the Junction Box	IW 8029 A0																																																					
⇒ Checking and cleaning the surge arrester		■																																																				
⇒ Measuring capacitance		■																																																				
⇒ Replacing the unit		■																					</																															

		c	t	s	< 100 Oh	every 1,000 Oh	1,000 Oh	2,000 Oh	3,333 Oh	4,000 Oh	6,000 Oh	6,666 Oh	8,000 Oh	10,000 Oh	12,000 Oh	13,333 Oh	14,000 Oh	16,000 Oh	16,666 Oh	18,000 Oh	20,000 Oh	22,000 Oh	23,333 Oh	24,000 Oh	26,000 Oh	26,666 Oh	28,000 Oh	30,000 Oh	31,000 Oh	32,000 Oh	33,333 Oh	34,000 Oh	36,000 Oh	36,666 Oh	38,000 Oh	40,000 Oh	42,000 Oh	43,333 Oh	44,000 Oh	46,000 Oh	46,666 Oh	48,000 Oh	50,000 Oh	52,000 Oh	53,333 Oh	54,000 Oh	56,000 Oh	56,666 Oh	58,000 Oh	60,000 Oh											
⇒ Tightening the bolted joints	IW 8040 A0		■																																																										
Surge arrester	IW 8047 A0																																																												
⇒ Checking the surge arrester			■																																																										
Overvoltage deflector	IW 8048 A0																																																												
⇒ Checking the overvoltage deflector			■																																																										
Thermal reactor - CL.Air	IW 8070 A0																																																												
⇒ Measuring heating conductor resistance and heating conductor insulation resistance		■	■							■			■		■			■			■			■		■		■			■		■			■			■			■		■			■			■			■								
⇒ Electric linear actuator (if installed): Check the condition of the insulation		■																																																											
⇒ Electric linear actuator (if installed): Checking the brake air gap		■																																																											
⇒ Gas injection lines: Checking for leaks in the gas train and the gas injection line		■	■				■		■	■		■	■	■		■	■		■	■	■		■	■		■	■		■	■		■	■	■		■	■		■	■	■		■	■	■		■	■	■		■	■		■							
⇒ Changing the compressed air compressor		■																																																											
⇒ Inspecting the thermal reactor			■																																																										
⇒ Gas injection lines: Draining condensate water (BR2 and BR3 only)			■																																																										
⇒ Inspecting the compressed air compressor			■																																																										
⇒ Inspecting and measuring electrical equipment			■							■			■		■			■			■			■		■		■			■		■			■			■			■		■			■			■			■								
⇒ Maintaining the compressed air compressor			■										■					■						■							■						■				■				■			■			■			■							
⇒ Measuring the differential pressure								■		■	■		■	■	■		■	■		■	■	■		■	■		■	■		■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■						
⇒ Diaphragm gas compressor – KNF: Inspecting membranes								■		■	■		■	■	■		■	■		■	■	■		■	■		■	■		■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■						
⇒ Side channel gas compressor – CSK: Inspecting the fan								■		■	■		■	■	■		■	■		■	■	■		■	■		■	■		■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■						
⇒ 4-way exhaust-gas valve: Inspecting shafts and lubricating external plain bearings									■			■		■				■			■			■			■		■			■			■			■			■			■			■			■			■		■						
⇒ Diaphragm gas compressor – KNF: Changing diaphragms and valve springs										■			■		■			■			■			■			■		■			■			■			■			■			■			■			■			■		■						
⇒ Cleaning the gas injection lances													■					■						■							■						■				■				■			■			■			■							
⇒ 4-way exhaust-gas valve: Replacing gaskets and O-rings of stuffing box packing													■					■													■						■				■				■			■			■			■							
⇒ Gas injection lines: Inspecting valves													■					■						■							■						■				■				■			■			■			■							
⇒ Side channel gas compressor – CSK: Changing the diaphragm lip seal and general cleaning													■					■						■							■						■				■				■			■			■			■							
⇒ 4-way exhaust-gas valve: Replacing sealing elements of the compressed air cylinder (if installed)																													■																									■							
Condensate removal in the fuel gas system	IW 8090 A0																																																												

c- Condition-dependent t- Time-dependent s- Start-dependent		c	t	s	< 100 Oh	every 1,000 Oh	1,000 Oh	2,000 Oh	3,333 Oh	4,000 Oh	6,000 Oh	6,666 Oh	8,000 Oh	10,000 Oh	12,000 Oh	13,333 Oh	14,000 Oh	16,000 Oh	16,666 Oh	18,000 Oh	20,000 Oh	22,000 Oh	23,333 Oh	24,000 Oh	26,000 Oh	26,666 Oh	28,000 Oh	30,000 Oh	31,000 Oh	32,000 Oh	33,333 Oh	34,000 Oh	36,000 Oh	36,666 Oh	38,000 Oh	40,000 Oh	42,000 Oh	43,333 Oh	44,000 Oh	46,000 Oh	46,666 Oh	48,000 Oh	50,000 Oh	52,000 Oh	53,333 Oh	54,000 Oh	56,000 Oh	56,666 Oh	58,000 Oh	60,000 Oh																								
⇒ Manual condensate drain: Drain off condensate	IW 8090 A0	■																																																																								
⇒ Automatic condensate removal: Check for leaks			■					■		■	■		■	■	■		■	■		■	■	■		■	■		■	■		■		■	■		■	■		■	■		■	■		■	■		■	■		■	■		■	■																				
<b>Exhaust gas system condensate drain line</b>	IW 8095 A0																																																																									
⇒ Inspecting the condensate drain line in the exhaust gas system		■																																																																								
<b>Generator</b>	W 8030 A0																																																																									
⇒ Relubricating the bearing(s)		■								■			■		■			■			■			■			■		■		■		■				■				■		■					■			■			■																				
⇒ Measuring the insulation/polarisation		■												■							■								■																											■																		
⇒ Daily check			■																																																																							
⇒ Overhauling the generator				■																																																						■																
⇒ Inspecting and cleaning the generator														■							■								■																											■																		
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)														■							■								■																											■																		
⇒ Replacing the bearing(s)															■							■							■																											■																		
<b>Generator</b>	W 8032 A0							■	■	■		■	■	■		■	■		■	■	■	■		■	■		■	■	■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■		■	■																	
⇒ Relubricating the bearing(s)		■						■		■	■		■	■	■		■	■		■	■	■		■	■		■	■	■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■		■	■																	
⇒ Measuring the insulation/polarisation		■												■							■								■																											■																		
⇒ Replacing the bearing(s)		■																			■																																				■																	
⇒ Daily check			■																																																																							
⇒ Overhauling the generator				■																																																					■																	
⇒ Inspecting and cleaning the generator														■							■								■																											■																		
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)														■							■								■																											■																		
⇒ Replacing the bearing(s)																						■																																			■																	
<b>Generator</b>	W 8034 A0					■																																																																				
⇒ Relubricating the bearing(s)		■				■																																																																				
⇒ Measuring the insulation/polarisation		■												■							■									■																																												
⇒ Daily check			■																																																																							
⇒ Overhauling the generator				■																																																																					■	
⇒ Inspecting and cleaning the generator														■							■								■																																			■										
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)														■							■								■																																			■										
⇒ Replacing the bearing(s)																						■																																																			■	
<b>Generator</b>	W 8035 A0					■																																																																				
⇒ Relubricating the bearing(s)		■				■																																																																				
⇒ Measuring the insulation/polarisation		■												■							■									■																																										■		
⇒ Daily check			■																																																																							
⇒ Overhauling the generator				■																																																																						

		c- Condition-dependent			t- Time-dependent			s- Start-dependent																																																					
		c	t	s	< 100 Oh	every 1,000 Oh	1,000 Oh	2,000 Oh	3,333 Oh	4,000 Oh	6,000 Oh	6,666 Oh	8,000 Oh	10,000 Oh	12,000 Oh	13,333 Oh	14,000 Oh	16,000 Oh	16,666 Oh	18,000 Oh	20,000 Oh	22,000 Oh	23,333 Oh	24,000 Oh	26,000 Oh	26,666 Oh	28,000 Oh	30,000 Oh	31,000 Oh	32,000 Oh	33,333 Oh	34,000 Oh	36,000 Oh	36,666 Oh	38,000 Oh	40,000 Oh	42,000 Oh	43,333 Oh	44,000 Oh	46,000 Oh	46,666 Oh	48,000 Oh	50,000 Oh	52,000 Oh	53,333 Oh	54,000 Oh	56,000 Oh	56,666 Oh	58,000 Oh	60,000 Oh											
⇒ Inspecting and cleaning the generator	W 8035 A0													■							■								■																				■												
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)														■							■								■																				■												
⇒ Replacing the bearing(s)																					■																														■										
Generator	W 8037 A0																																																												
⇒ Relubricating the bearing(s)		■						■		■	■		■	■	■		■	■		■	■	■		■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■									
⇒ Measuring the insulation/polarisation		■												■							■								■																					■											
⇒ Replacing the bearing(s)		■																			■																														■										
⇒ Daily check			■																																																										
⇒ Overhauling the generator					■																																														■										
⇒ Inspecting and cleaning the generator															■							■								■																				■											
⇒ Carrying out a vibration measurement and replacing the earth brush (if fitted)															■							■								■																				■											
Plate heat exchanger		W 8043 A0																																																											
⇒ Replace the O-rings and rubber seals	■		■																																																	■									
⇒ Overhauling the plate heat exchanger																																																			■										
Gas train	W 8045 A0																																																												
⇒ Inspect the gas filter and replace if necessary			■						■			■		■		■			■		■		■			■		■			■			■		■		■		■		■		■		■		■		■		■									
⇒ Overhauling the gas train			■																																																■										
⇒ Inspecting the gas train														■							■									■																				■											
⇒ Overhauling the gas pressure controller/gas regulator																														■																					■										
⇒ Overhauling the zero pressure controller (optional)																														■																					■										
Flat-bed cooler	W 8065 A0																																																												
⇒ Inspecting the fan power unit			■																																																										
⇒ Inspecting the fan bearing			■																																																										
⇒ Inspecting the fans			■																																																										
⇒ Inspecting the fan blades			■																																																										
Activated carbon adsorber	W 8074 A0																																																												
⇒ Flushing the activated carbon adsorber		■																																																											
⇒ Checking the activated carbon mass		■																																																											
⇒ Emptying and filling the activated carbon		■																																																											
Cooling water	W 8080 A0																																																												
⇒ Cooling water analysis		■	■					■		■	■		■	■	■		■	■		■	■	■		■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■	■		■	■									
⇒ Replacing the cooling water		■																																																											
⇒ Checking the water pressure			■																																																										
⇒ Replacing O-rings			■																			■																														■									



[illegible]

[illegible]

		c	t	s	< 100 Oh	every 1,000 Oh	1,000 Oh	2,000 Oh	3,333 Oh	4,000 Oh	6,000 Oh	6,666 Oh	8,000 Oh	10,000 Oh	12,000 Oh	13,333 Oh	14,000 Oh	16,000 Oh	16,666 Oh	18,000 Oh	20,000 Oh	22,000 Oh	23,333 Oh	24,000 Oh	26,000 Oh	26,666 Oh	28,000 Oh	30,000 Oh	31,000 Oh	32,000 Oh	33,333 Oh	34,000 Oh	36,000 Oh	36,666 Oh	38,000 Oh	40,000 Oh	42,000 Oh	43,333 Oh	44,000 Oh	46,000 Oh	46,666 Oh	48,000 Oh	50,000 Oh	52,000 Oh	53,333 Oh	54,000 Oh	56,000 Oh	56,666 Oh	58,000 Oh	60,000 Oh															
⇒ Overhauling the exhaust-gas turbocharger	W 8025 M0	■	■	■																	■																																■												
⇒ Check that all the bolted joints/seals and covers sit properly.									■			■		■					■		■		■				■		■					■				■												■															
⇒ Replacing O-rings																					■																■																	■											
Starter motor	W 8032 M0																																																																
⇒ Replacing the starter motor				■											■							■							■																								■												
Piston	W 8047 M0																																																																
⇒ Replacing the O-ring at the piston cooling nozzle			■																										■																										■										
⇒ Replace piston, piston rings and piston pins					■																									■																								■											
⇒ Overhaul the piston cooling nozzles					■																									■																								■											
Conrod	W 8048 M0																																																																
⇒ Replacing conrods				■																									■																										■										
⇒ Replacing big-end bolts					■																									■																									■										
⇒ Replacing big-end bearing shells					■																									■																									■										
Cylinder liner	W 8049 M0																																																																
⇒ Replacing a cylinder liner				■																									■																									■											
⇒ Replacing O-rings				■																									■																										■										
⇒ Replacing the scraper ring (if fitted)				■																									■																										■										
Crankshaft main bearing/Crankshaft thrust bearing	W 8050 M0																																																																
⇒ Replace the lower crankshaft thrust bearing shell		■		■																									■																									■											
⇒ Inspect the upper crankshaft thrust bearing shell and check that it is firmly seated		■		■																									■																									■											
⇒ Replace crankshaft main bearings				■																									■																										■										
Exhaust gas manifold	W 8051 M0																																																																
⇒ Inspect the exhaust-gas collection line and insulation		■		■																																																													
Pre-lubrication pump	W 8054 M0																																																																
⇒ Electric motor - inspecting the brushes		■		■				■			■			■		■				■		■				■			■				■				■		■			■					■					■													
⇒ Electric motor - inspecting the brushes		■		■											■						■							■			■															■					■														
⇒ Electric motor - replacing the brushes				■																	■																	■															■												
⇒ Overhauling the pre-lubrication pump				■																																																		■											
Crankcase	W 8061 M0																																																																
⇒ Replacing O-rings			■																										■																									■											
Lubricating oil	IW 0102 M4																																																																
⇒ Change the lubricating oil		■																																																															
⇒ Replacing O-rings			■																		■																																■												
⇒ Replace hoses			■																		■																	■																■											
Valve clearance	W 0400 M4																																																																

		c	t	s	< 100 Oh	every 1,000 Oh	1,000 Oh	2,000 Oh	3,333 Oh	4,000 Oh	6,000 Oh	6,666 Oh	8,000 Oh	10,000 Oh	12,000 Oh	13,333 Oh	14,000 Oh	16,000 Oh	16,666 Oh	18,000 Oh	20,000 Oh	22,000 Oh	23,333 Oh	24,000 Oh	26,000 Oh	26,666 Oh	28,000 Oh	30,000 Oh	31,000 Oh	32,000 Oh	33,333 Oh	34,000 Oh	36,000 Oh	36,666 Oh	38,000 Oh	40,000 Oh	42,000 Oh	43,333 Oh	44,000 Oh	46,000 Oh	46,666 Oh	48,000 Oh	50,000 Oh	52,000 Oh	53,333 Oh	54,000 Oh	56,000 Oh	56,666 Oh	58,000 Oh	60,000 Oh											
⇒ Checking that the valves are set at an equal level	W 0400 M4								■			■		■		■			■		■		■			■		■			■			■			■		■			■			■			■			■										
⇒ Checking valve clearance									■			■		■		■			■		■		■			■		■			■			■		■			■		■			■			■			■											
⇒ Measuring valve stem projection										■			■		■		■			■		■		■			■		■			■			■		■			■		■			■			■			■										
⇒ Checking the rocker cover moulded gasket										■			■		■		■			■		■		■			■		■			■			■		■			■		■			■			■			■										
<b>Crankcase ventilation</b>	W 0507 M4																																																												
⇒ Replacing the oil mist separator		■	■												■							■							■																											■					
⇒ Measuring the differential pressure			■							■			■		■		■			■		■		■			■		■			■			■			■		■			■		■			■			■			■							
⇒ Replacing the blow-by hoses			■																			■																																			■				
<b>Oil filter insert</b>	W 8038 M4																																																												
⇒ Replacing the oil filter insert		■								■			■		■		■			■		■		■			■		■			■			■		■			■		■			■			■			■			■							
⇒ Replacing the O-rings		■	■																																																										
<b>Cylinder head</b>	W 8053 M4																																																												
⇒ Replacing the cylinder head		■		■																									■																												■				
⇒ Replacing the rocker cover moulded gasket			■												■							■								■																										■					
⇒ Replacing the O-rings on the cylinder head			■																										■																												■				
<b>Safety valve</b>	-----																																																												
⇒ Inspect safety valve		■	■																																																										
<b>Gas and smoke alarm system</b>	-----																																																												
⇒ Inspect gas and smoke alarm system		■	■																																																										