

Service, Wärtsilä Nederland B.V.

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99 Service information	D232	Service	09.06.2008	01	SN232/99/7001	1(2) + encl.

D232 Maintenance schedules/ maintenance parts

Engine manual ref. Chapter 'Maintenance schedules'

General

For business activities it is necessary to make fast offers to our customers. For this purpose lists with spare parts numbers and corresponding ETL – pages have been added to the enclosed maintenance schedules.

This information is indicative!



As soon as the order is assigned, it is absolutely necessary to check if the indicative parts can be used for a specific engine of the client, by using 'Depic' to find the right engine configuration, by filling in the right engine number.

Ordering parts According the standard ordering procedure as described in the engine specific parts catalogue.

Applies to All D232 engines.

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Enclosure Maintenance schedules/ maintenance parts.



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Maintenance schedules/ maintenance parts D232

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Engine type		D232V6			D232V8			D232V12			TD232V6			TD232V8			TD232V12			TBD232V12		
Turbocharger		Without turbocharger									With turbocharger											
Charge air cooler		Without charge air cooler															With charge air cooler					
Power category		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Power at:																						
1500 rpm	kW	80	80	82	107	107	110	151	160	159	105	-	110	140	140	147	210	220	220	246	257	270
	HP	109	109	111	145	145	150	205	218	216	143	-	150	190	190	200	286	299	299	334	350	367
1800 rpm	kW	96	96	100	127	127	132	180	191	188	123	-	129	164	167	172	247	260	260	295	-	315
	HP	131	131	136	173	173	179	245	260	256	167	-	175	223	227	234	336	354	354	401	-	428
2000 rpm	kW	106	-	110	141	-	146	198	-	205	129	-	139	171	-	188	258	-	278	316	-	341
	HP	144	-	150	192	-	199	269	-	279	175	-	189	232	-	256	351	-	378	430	-	464
2100 rpm	kW	109	-	114	145	-	152	205	-	212	132	-	144	176	-	192	265	-	287	324	-	351
	HP	148	-	155	197	-	207	279	-	288	179	-	196	239	-	261	360	-	390	441	-	477
2300 rpm	kW	112	-	118	149	-	157	218	-	228	138	-	152	184	-	202	276	-	304	335	-	368
	HP	152	-	160	203	-	213	296	-	310	188	-	207	250	-	275	375	-	413	455	-	500
2500 rpm	kW	-	-	119	-	-	159	-	-	238	-	-	-	-	-	-	-	-	-	-	-	-
	HP	-	-	162	-	-	216	-	-	324	-	-	-	-	-	-	-	-	-	-	-	-

Power category I Continuous operation unrestricted in time (10% overload permissible for 1 hour within 12 hours) according ISO 3046/1* (gensets, continue speed propulsion)

Power category II Emergency generator operation, overload permissible as by power category I

Power category III Variable load operation restricted in time. Maximum 1 hour 100% power every 6 hours (fuel stop at 100% load). (e.g. variable pitch propeller, water jet)

* **ISO 3046/1** Air temperature = 27 °C, outside air pressure = 1000 mbar, relative air humidity = 60%, raw cooling water temperature inlet = 27 °C

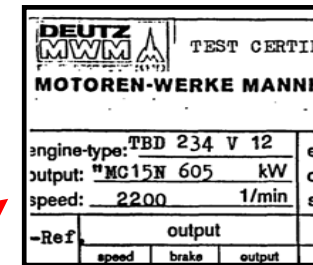
Maintenance scope	Type of personnel	Maximal maintenance interval
E10 = Done at 50 running hours after mayor overhaul (E70)	Technical skilled persons	-
E20 = Daily check	Technical skilled persons	-
E25 = Periodic maintenance (small scope)	Technical skilled persons	-
E30 = Periodic maintenance (increased scope)	Technical skilled persons	1 year
E40 = Periodic maintenance (medium scope)	Technical skilled persons	2 years
E50 = Periodic maintenance (extended scope)	Authorised specialists	2 years
E60 = Intermediate overhaul	Authorised specialists	6 years
E70 = Mayor overhaul	Authorised specialists	18 years

Cleaning should be done more frequently if increased contamination prevails.

Checking means: Visual inspection or dimensional check, adjustment, reconditioning or replacement may be necessary.

The power rating can be found at the test bed protocol or at the rating shield of the engine.

Examples



Definition of activities in the maintenance schedule

Adjust	Adjust torques, dimensions, pressures etc.; extra work may be necessary to renew parts.
Drain water	Drain condensed water for example.
Renew	Renew parts, assembly groups and liquids.
Recondition	Machine material within the set tolerances to reinstate a nominal condition.
Check	Visual inspection or dimensional check according the criteria in the Job Card. Adjustment, reconditioning, rejection of the part, if not all criteria are fulfilled, or replacement may be necessary.
Clean	Cleaning by hand or machine, renewal of cleaning parts (e.g. air filters) may be necessary.
Visual Inspection	Visual inspection according to Job Card. Rejection of the part, if not all criteria are fulfilled.
Overhaul	Check assembly groups, rework or renew parts.
Maintain	Maintain according to Job Card. Checking of functions; reworking or renewal of parts may be necessary.
Change	Change lubricating oil for example.

2. Maintenance schedule E20-E10

No	E20 - Daily	Construction group	Periodic maintenance jobs	Action	Job card
1	x	15	Level of Lubricating oil in sump	Check	3.1.1.2
2	x	22	Difference pressure indicator pico air filter	Check	3.1.1.4
3	x	22	Dust collector from cyclone air filter	Clean	3.1.1.4
4	x	32	Leak-free operation of engine	Check	3.1.1.3
5	x	38	Level of cooling water in expansion tank	Check	3.1.1.1
6	x	99	Operating temperatures and pressures etcetera	Check	

Always check manual for special jobs and procedures

No	E10 - 50 hrs	Construction group	Periodic maintenance jobs	Action	Job card
1	x	08	Cylinder head bolts	Retighten	3.3.001
2	x	11	Valve clearance	Check	3.2.028
3	x	15	Lubricating oil filling	Renew	3.2.001
4	x	15	Lubricating oil filter cartridges	Renew	3.2.025
5	x	15	Lubricating oil centrifuge	Clean	3.2.004
6	x	37	Raw water pump	Lubricate	
7	x	44	V-belt	Check	

Always check your manual for special jobs and procedures

No	E25 - 250 hrs	E30 - 500 hrs	E40 - 2.000 hrs	E50 - 6.000 hrs	E60 - 12.000 hrs	E70 - 24.000 hrs	Construction group	Periodic maintenance jobs	Action	Operation Manual (TB)D232 English 02974791 Job card	Workshop Manual (TB)D234 English 02975706 Job card
1	x	x	x	x	x	x	15	Lubricating oil filling ¹	Renew	3.2.001	
2	x	x	x	x	x	x	15	Lubricating oil centrifuge	Clean	3.2.004	
3	x	x	x	x	x	x	22	Oil bath air filter ²	Clean	3.2.002	
4	x	x	x	x	x	x	37	Raw water pump	Lubricate	3.2.006	
5	x	x	x	x	x	x	37	Zinc protective elements	Check	3.2.005	
6	x	x	x	x	x	x	44	V-belt	Check	3.2.006	
7	x	x	x	x	x	x	44	Bearings of dynamo	Lubricate	3.2.009	
8	x	x	x	x	x	x	48	Speed control rod	Check / grease	3.2.007	
9		x	x	x	x	x	11	Valve clearance	Check	3.2.028	
10		x	x	x	x	x	15	Lubricating oil filter cartridges	Renew	3.2.025	
11		x	x	x	x	x	17	Injection pump drive coupling	Check	3.2.027	
12		x	x	x	x	x	38	Anti-freeze / anti corrosion liquid in cooling water	Check	-	
13		x	x	x	x	x	38	Hose connection	Check	3.2.026	
14			x	x	x	x	01	Crankcase breather	Check	3.2.054	-
15			x	x	x	x	05	Rubber coupling and rubber foundation	Check	3.2.051	
16			x	x	x	x	08	Compression pressure	Check	3.2.062	
17			x	x	x	x	17	Injection timing	Check	3.3.002	
18			x	x	x	x	19	Injection nozzles	Check	3.2.052	
19			x	x	x	x	20	Fuel filter elements	Renew	3.2.053	
20			x	x	x	x	38	Ball bearings from cooling water pumps and wheels	Check	3.2.050	
21			x	x	x	x	38	Fresh cooling water cooler	Clean	3.2.058	
22			x	x	x	x	38	Thermostats	Check	3.2.057	-
23			x	x	x	x	38	Cooling water space	Clean	3.2.060	
24			x	x	x	x	38	Flexible connections	Renew	3.2.061	
25			x	x	x	x	41	Exhaust gas pipes	Clean	3.2.056	
26			x	x	x	x	44	V-belt	Renew	-	
27			x	x	x	x	44	Carbon brushes and pinion of starter	Renew	3.2.064	
28			x	x	x	x	44	Carbon brushes dynamo	Renew	3.2.065/066	
29			x	x	x	x	48	Engine monitoring	Check	3.2.059	
30			x	x	x	x	58	Charge air cooler	Clean	3.2.063	

No	E25 - 250 hrs	E30 - 500 hrs	E40 - 2.000 hrs	E50 - 6.000 hrs	E60 - 12.000 hrs	E70 - 24.000 hrs	Construction group	Periodic maintenance jobs	Action	Operation Manual (TB)D232 English 02974791 Job card	Workshop Manual (TB)D234 English 02975706 Job card
31			x	x	x	x	99	Tightness of connections	Check	3.2.003	
32				x	x	x	43	Turbocharger bearing clearance + cleanliness	Check		Page 324
33					x	x	04	Cylinder liners	Check		-
34					x	x	08	Cylinder heads	Overhaul		4.5.012/013/014/015/016/017
35					x	x	21	Injection pipes	Renew		-
36						x	01	Crankshaft seals	Replace		4.3.003
37						x	05	Connecting rod and main bearing	Renew		4.5.022
38						x	05	Crankshaft	Check		4.5.024
39						x	05	Bearings of mass balancing device	Renew		4.5.025
40						x	05	Gear drive	Check		4.5.010
41						x	07	Pistons	Check		4.5.018
42						x	10	Camshaft	Check		4.5.028
43						x	10	Camshaft bearings	Check		4.5.028
44						x	14	Lubricating oil pump	Replace		4.5.011
45						x	15	Lubricating oil cooler	Clean		4.4.007
46						x	17	Injection pump, injection pump drive and coupling	Overhaul		4.5.005/006/027
47						x	22	Crankcase breather	Renew		-
48						x	34	Vibration damper	Replace		4.5.010
49						x	37	Cooling water pumps	Replace		4.4.009 / 4.4.011
50						x	43	Turbocharger	Renew		By manufacturer

Always check manual for special jobs and procedures
¹ Interval for engines without turbocharger with normal load operation. For other circumstances, see 2.8.7 from Operation Manual

² Wet air filters have to be cleaned every 100 hours. For dry air filters, check difference pressure indicator

No	E25 - 1 month	E30 - 1 year	E40/E50 - 2 years	E60 - 6 years	E70 - 18 years	Construction group	Periodic maintenance jobs	Action	Operation Manual (TB)D232 English 02974791 Job card	Workshop Manual (TB)D234 English 02975706 Job card
1	x	x	x	x	x	99	Trail run	-		
2	x	x	x	x	x	38	Anti-freeze / anti-corrosion agent in cooling water	Check		
3		x	x	x	x	01	Crankcase breather	Check	3.2.054	
4		x	x	x	x	11	Valve clearance	Check	3.2.028	
5		x	x	x	x	15	Lubricating oil filling ¹	Renew	3.2.001	
6		x	x	x	x	15	Lubricating oil centrifuge	Clean	3.2.004	
7		x	x	x	x	15	Lubricating oil filter cartridges	Renew	3.2.025	
8		x	x	x	x	17	Injection pump drive coupling	Check	3.2.027	
9		x	x	x	x	22	Oil bath air filter ²	Clean	3.2.002	
10		x	x	x	x	37	Raw water pump	Lubricate	3.2.006	
11		x	x	x	x	37	Zinc protective elements	Check	3.2.005	
12		x	x	x	x	38	Hose connection	Check	3.2.026	
13		x	x	x	x	44	V-belt	Check	3.2.006	
14		x	x	x	x	44	Bearings of dynamo	Lubricate	3.2.009	
15		x	x	x	x	48	Speed control rod	Check / grease	3.2.007	
16			x	x	x	08	Compression pressure	Check	3.2.062	
17			x	x	x	19	Injection nozzles	Check	3.2.052	
18			x	x	x	20	Fuel filter elements	Renew	3.2.053	
19			x	x	x	05	Rubber coupling and rubber foundation	Check	3.2.051	
20			x	x	x	17	Injection timing	Check	3.3.002	
21			x	x	x	38	Ball bearings from cooling water pumps and wheels	Check	3.2.050	
22			x	x	x	38	Fresh cooling water cooler	Clean	3.2.058	
23			x	x	x	38	Thermostats	Check	3.2.057	-
24			x	x	x	38	Cooling water space	Clean	3.2.060	
25			x	x	x	38	Flexible connections	Renew	3.2.061	
26			x	x	x	41	Exhaust gas pipes	Clean	3.2.056	
27			x	x	x	44	V-belt	Renew	-	
28			x	x	x	44	Carbon brushes and pinion of starter	Renew	3.2.064	
29			x	x	x	44	Carbon brushes dynamo	Renew	3.2.065/066	
30			x	x	x	48	Engine monitoring	Check	3.2.059	
31			x	x	x	58	Charge air cooler	Clean	3.2.063	
32			x	x	x	99	Tightness of connections	Check	3.2.003	
33			x	x	x	43	Turbocharger bearing clearance + cleanliness	Check		Page 324

No	E25 - 1 month	E30 - 1 year	E40/E50 - 2 years	E60 - 6 years	E70 - 18 years	Construction group	Periodic maintenance jobs	Action	Operation Manual (TB)D232 English 02974791 Job card	Workshop Manual (TB)D234 English 02975706 Job card
34				x	x	04	Cylinder liners	Check		-
35				x	x	08	Cylinder heads	Overhaul		4.5.012/013/014/015/016/017
36				x	x	21	Injection pipes	Renew		-
37					x	01	Crankshaft seals	Replace		4.3.003
38					x	05	Connecting rod and main end bearing	Renew		4.5.022
39					x	05	Crankshaft	Check		4.5.024
40					x	05	Bearings of mass balancing device	Renew		4.5.025
41					x	05	Gear drive	Check		4.5.010
42					x	07	Pistons	Check		4.5.018
43					x	10	Camshaft	Check		4.5.028
44					x	10	Camshaft bearings	Check		4.5.028
45					x	14	Lubricating oil pump	Replace		4.5.011
46					x	15	Lubricating oil cooler	Clean		4.4.007
47					x	17	Injection pump, injection pump drive and coupling	Overhaul		4.5.005/006/027
48					x	22	Crankcase breather	Renew		-
49					x	34	Vibration damper	Replace		4.5.010
50					x	37	Cooling water pumps	Replace		4.4.009 / 4.4.011
51					x	43	Turbocharger	Renew		By manufacturer

Always check manual for special jobs and procedures

² Wet air filters have to be cleaned every month. For dry air filters, check difference pressure indicator

³ Vibration damper to be exchanged at 18.000 hrs.

* Maintenance has to be executed at hour interval or yearly interval, whatever is reached first

No	E25 - 250 hrs	E30 - 500 hrs	E40/E50 - 2.000 hrs	E60 - 6.000 hrs	E70 - 18.000 hrs	Construction group	Periodic maintenance jobs	Action	Operation Manual (TB)D232	Workshop Manual (TB)D234
									English 02974791	English 02975706
								Job card	Job card	
1	x	x	x	x	x	15	Lubricating oil filling ¹	Renew	3.2.001	
2	x	x	x	x	x	15	Lubricating oil centrifuge	Clean	3.2.004	
3	x	x	x	x	x	22	Oil bath air filter ²	Clean	3.2.002	
4	x	x	x	x	x	37	Raw water pump	Lubricate	3.2.006	
5	x	x	x	x	x	37	Zinc protective elements	Check	3.2.005	
6	x	x	x	x	x	44	V-belt	Check	3.2.006	
7	x	x	x	x	x	44	Bearings of dynamo	Lubricate	3.2.009	
8	x	x	x	x	x	48	Speed control rod	Check / grease	3.2.007	
9		x	x	x	x	11	Valve clearance	Check	3.2.028	
10		x	x	x	x	15	Lubricating oil filter cartridges	Renew	3.2.025	
11		x	x	x	x	17	Injection pump drive coupling	Check	3.2.027	
12		x	x	x	x	38	Anti-freeze / anti corrosion liquid in cooling water	Check	-	
13		x	x	x	x	38	Hose connection	Check	3.2.026	
14			x	x	x	01	Crankcase breather	Check	3.2.054	-
15			x	x	x	05	Rubber coupling and rubber foundation	Check	3.2.051	
16			x	x	x	08	Compression pressure	Check	3.2.062	
17			x	x	x	17	Injection timing	Check	3.3.002	
18			x	x	x	19	Injection nozzles	Check	3.2.052	
19			x	x	x	20	Fuel filter elements	Renew	3.2.053	
20			x	x	x	38	Ball bearings from cooling water pumps and wheels	Check	3.2.050	
21			x	x	x	38	Fresh cooling water cooler	Clean	3.2.058	
22			x	x	x	38	Thermostats	Check	3.2.057	-
23			x	x	x	38	Cooling water space	Clean	3.2.060	
24			x	x	x	38	Flexible connections	Renew	3.2.061	
25			x	x	x	41	Exhaust gas pipes	Clean	3.2.056	
26			x	x	x	44	V-belt	Renew	-	
27			x	x	x	44	Carbon brushes and pinion of starter	Renew	3.2.064	
28			x	x	x	44	Carbon brushes dynamo	Renew	3.2.065/066	
29			x	x	x	48	Engine monitoring	Check	3.2.059	
30			x	x	x	58	Charge air cooler	Clean	3.2.063	
31			x	x	x	99	Tightness of connections	Check	3.2.003	
32			x	x	x	43	Turbocharger bearing clearance + cleanliness	Check		Page 324
33				x	x	04	Cylinder liners	Check		-

No	E25 - 250 hrs	E30 - 500 hrs	E40/E50 - 2.000 hrs	E60 - 6.000 hrs	E70 - 18.000 hrs	Construction group	Periodic maintenance jobs	Action	Operation Manual (TB)D232 English 02974791 Job card	Workshop Manual (TB)D234 English 02975706 Job card
34				x	x	08	Cylinder heads	Overhaul		4.5.012/013/014/015/016/017
35				x	x	21	Injection pipes	Renew		-
36					x	01	Crankshaft seals	Replace		4.3.003
37					x	05	Connecting rod and main bearing	Renew		4.5.022
38					x	05	Crankshaft	Check		4.5.024
39					x	05	Bearings of mass balancing device	Renew		4.5.025
40					x	05	Gear drive	Check		4.5.010
41					x	07	Pistons	Check		4.5.018
42					x	10	Camshaft	Check		4.5.028
43					x	10	Camshaft bearings	Check		4.5.028
44					x	14	Lubricating oil pump	Replace		4.5.011
45					x	15	Lubricating oil cooler	Clean		4.4.007
46					x	17	Injection pump, injection pump drive and coupling	Overhaul		4.5.005/006/027
47					x	22	Crankcase breather	Renew		-
48					x	34	Vibration damper	Replace		4.5.010
49					x	37	Cooling water pumps	Replace		4.4.009 / 4.4.011
50					x	43	Turbocharger	Renew		By manufacturer

Always check manual for special jobs and procedures
¹ Interval for engines without turbo with normal load operation. For other circumstances, see 2.8.7 from Operation Manual

² Wet air filters have to be cleaned every 100 hrs. For dry air filters, check difference pressure indicator

6. Maintenance parts E10-E25

Maintenance parts E10

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
1	15			Packing ring	2	DZ01118718		Lubricating oil filling - Renew
2	15			Packing ring	2	DZ01118688		Lubricating oil filling - Renew
3	15	232.4.256	2	Filter cartridge	2	DZ01174421		Oil bath air filter - Clean
4	15	232.1.258	6	Collar	1	DZ12155693		Lubricating oil centrifuge - Clean
5	15			Packing ring	1	DZ03474852		Lubricating oil centrifuge - Clean
6	15			Packing ring	1	DZ12154580		Lubricating oil centrifuge - Clean

Maintenance parts E25

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
1	15			Packing ring	2	DZ01118718		Lubricating oil filling - Renew
2	15			Packing ring	2	DZ01118688		Lubricating oil filling - Renew
3	15	232.4.256	2	Filter cartridge	2	DZ01174421		Oil bath air filter - Clean
4	15	232.1.258	6	Collar	1	DZ12155693		Lubricating oil centrifuge - Clean
5	15			Packing ring	1	DZ03474852		Lubricating oil centrifuge - Clean
6	15			Packing ring	1	DZ12154580		Lubricating oil centrifuge - Clean
7	37	232.3.701		Zink anode	2	DZ01222409	Inspection dependable	Zinc protective elements - Check
8	37	232.3.701	19	Sealing ring	2	DZ01157700	Inspection dependable	Zinc protective elements - Check
9				Sealing ring	2	DZ01157670	Inspection dependable	Zinc protective elements - Check
10				Zink anode	2	DZ01222410	Inspection dependable	Zinc protective elements - Check

These lists are not engine specific. Always double check in Depic if a part is used in the specific engine to maintain!

Remark: the quantity of the mentioned maintenance parts are for engines with eight cylinders!

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
1	15			Packing ring	2	DZ01118718		Lubricating oil filling - Renew
2	15			Packing ring	2	DZ01118688		Lubricating oil filling - Renew
3	15	232.4.256	2	Filter cartridge	2	DZ01174421		Oil bath air filter - Clean
4	15	232.1.258	6	Collar	1	DZ12155693		Lubricating oil centrifuge - Clean
5	15			Packing ring	1	DZ03474852		Lubricating oil centrifuge - Clean
6	15			Packing ring	1	DZ12154580		Lubricating oil centrifuge - Clean
7	37	232.3.701		Zink anode	2	DZ01222409	Inspection dependable	Zinc protective elements - Check
8	37	232.3.701	19	Sealing ring	2	DZ01157700	Inspection dependable	Zinc protective elements - Check
9				Sealing ring	2	DZ01157670	Inspection dependable	Zinc protective elements - Check
10				Zink anode	2	DZ01222410	Inspection dependable	Zinc protective elements - Check
11				Sealing ring	4	DZ01118688	Inspection dependable	Injection pump drive coupling - Check
12				Gasket	8	DZ12161808		Valve clearance - Check
13				Sealing ring	8	DZ01118654		Valve clearance - Check
14			170	V-belt	1	DZ01154353	Inspection dependable	V-belt - Check
15			70	V-belt	1	DZ01175974	Inspection dependable	V-belt - Check

These lists are not engine specific. Always double check in Depic if a part is used in the specific engine to maintain

Remark: the quantity of the mentioned maintenance parts are for engines with eight cylinders!

8. Maintenance parts E40-E50

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
1	15			Packing ring	2	DZ01118718		Lubricating oil filling - Renew
2	15			Packing ring	2	DZ01118688		Lubricating oil filling - Renew
3	15	232.4.256	2	Filter cartridge	2	DZ01174421		Oil bath air filter - Clean
4	15	232.1.258	6	Collar	1	DZ12155693	Price not available	Lubricating oil centrifuge - Clean
5	15			Packing ring	1	DZ03474852		Lubricating oil centrifuge - Clean
6	15			Packing ring	1	DZ12154580	Price not available	Lubricating oil centrifuge - Clean
7	37	232.3.701		Zink anode	2	DZ01222409	Inspection dependable	Zinc protective elements - Check
8	37	232.3.701	19	Sealing ring	2	DZ01157700	Inspection dependable	Zinc protective elements - Check
9				Sealing ring	2	DZ01157670	Inspection dependable	Zinc protective elements - Check
10				Zink anode	2	DZ01222410	Inspection dependable	Zinc protective elements - Check
11				Gasket	8	DZ12161808		Valve clearance - Check
12				Sealing ring	10	DZ01118654		Valve clearance - Check
13			170	V-belt	1	DZ01154353	Inspection dependable	V-belt - Check
14			70	V-belt	1	DZ01175974	Inspection dependable	V-belt - Check
15	01			O-ring	1	DZ01163591		Crankcase breather - Check
16	08	232.3.331	14	Sealing ring	8	DZ01222774		Injection nozzles - Check
17	08	232.3.331	8	Sealing ring	16	DZ01117515		Injection nozzles - Check
18	08	232.3.331	4	Helical spring	8	DZ01148247	Inspection dependable	Injection nozzles - Check
19	08	232.3.331	18	O-ring	8	DZ01212509		Injection nozzles - Check
20	08	232.3.331	12	Nozzle tip	8	DZ12152949	Inspection dependable	Injection nozzles - Check
21	20	232.0.314	7	Sealing ring	2	DZ01118641		Fuel filter elements - Renew
22	20	232.0.314	4	Sealing ring	2	DZ01118713		Fuel filter elements - Renew
23	20	232.0.314	9	Sealing ring	7	DZ01118688		Fuel filter elements - Renew
24	20	232.0.314	10	Sealing ring	2	DZ12154530		Fuel filter elements - Renew
25	20	232.0.314	25	Filter cartridge	2	DZ01175893		Fuel filter elements - Renew
26				Gasket	4	DZ12164783		Exhaust gas pipes - Clean
27				O-ring	8	DZ01153835		Exhaust gas pipes - Clean
28				Gasket	8	DZ12161796		Exhaust gas pipes - Clean
29				Sealing ring	6	DZ01222820		Thermostats - Check
30				Thermostat	2	DZ12152726	Inspection dependable	Thermostats - Check
31				O-ring	4	DZ01171417		Fresh cooling water cooler - Clean
32				O-ring	2	DZ01153950		Fresh cooling water cooler - Clean
33				O-ring	1	DZ01153849		Fresh cooling water cooler - Clean
34				Gasket	1	DZ12161783		Fresh cooling water cooler - Clean
35				Packing compound	1	DZ01016253		Fresh cooling water cooler - Clean

8. Maintenance parts E40-E50

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
36				Insulator	4	DZ12154044		Flexible connections - Renew
37				vibration isolator	4	DZ12154043		Flexible connections - Renew
38				Insulator	2	DZ12154054		Flexible connections - Renew
39				Insulator	4	DZ12154046		Flexible connections - Renew
40				Sealing ring	8	DZ01151323		Compression pressure - Check
41				Gasket	2	DZ12161792		Charge air cooler - Clean
42				Gasket	2	DZ12275150		Charge air cooler - Clean
43				O-ring	2	DZ01153835		Charge air cooler - Clean
44				Carbon brushes	1	DZ12030138		Carbon brushes and pinion of starter - Renew
45				Pinion	1	DZ12156103		Carbon brushes and pinion of starter - Renew
46				Carbon brushes	1	DZ12155499		Carbon brushes dynamo - Renew
47				Spring lock washer	1	DZ01178307		Injection timing - Check

These lists are not engine specific. Always double check in Depic if a part is used in the specific engine to maintain!

Remark: the quantity of the mentioned maintenance parts are for engines with eight cylinders!

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
1	15			Packing ring	2	DZ01118718		Lubricating oil filling - Renew
2	15			Packing ring	2	DZ01118688		Lubricating oil filling - Renew
3	15	232.4.256	2	Filter cartridge	2	DZ01174421		Oil bath air filter - Clean
4	15	232.1.258	6	Collar	1	DZ12155693		Lubricating oil centrifuge - Clean
5	15			Packing ring	1	DZ03474852		Lubricating oil centrifuge - Clean
6	15			Packing ring	1	DZ12154580		Lubricating oil centrifuge - Clean
7	37	232.3.701		Zink anode	2	DZ01222409	Inspection dependable	Zinc protective elements - Check
8	37	232.3.701	19	Sealing ring	2	DZ01157700	Inspection dependable	Zinc protective elements - Check
9				Sealing ring	2	DZ01157670	Inspection dependable	Zinc protective elements - Check
10				Zink anode	2	DZ01222410	Inspection dependable	Zinc protective elements - Check
11				Gasket	8	DZ12161808		Valve clearance - Check
12				Sealing ring	10	DZ01118654		Valve clearance - Check
13			170	V-belt	1	DZ01154353		V-belt - Check
14			70	V-belt	1	DZ01175974		V-belt - Check
15	01			O-ring	1	DZ01163591		Crankcase breather - Check
16	08	232.3.331	14	Sealing ring	8	DZ01222774		Injection nozzles - Check
17	08	232.3.331	8	Sealing ring	16	DZ01117515		Injection nozzles - Check
18	08	232.3.331	4	Helical spring	8	DZ01148247		Injection nozzles - Check
19	08	232.3.331	18	O-ring	8	DZ01212509		Injection nozzles - Check
20	08	232.3.331	12	Nozzle tip	8	DZ12152949		Injection nozzles - Check
21	20	232.0.314	7	Sealing ring	2	DZ01118641		Fuel filter elements - Renew
22	20	232.0.314	4	Sealing ring	2	DZ01118713		Fuel filter elements - Renew
23	20	232.0.314	9	Sealing ring	15	DZ01118688		Fuel filter elements - Renew
24	20	232.0.314	10	Sealing ring	2	DZ12154530		Fuel filter elements - Renew
25	20	232.0.314	25	Filter cartridge	2	DZ01175893		Fuel filter elements - Renew
26				Gasket	4	DZ12164783		Exhaust gas pipes - Clean
27				O-ring	8	DZ01153835		Exhaust gas pipes - Clean
28				Gasket	8	DZ12161796		Exhaust gas pipes - Clean
29				Sealing ring	6	DZ01222820		Thermostats - Check
30				Thermostat	2	DZ12152726	Inspection dependable	Thermostats - Check
31				O-ring	4	DZ01171417		Fresh cooling water cooler - Clean
32				O-ring	2	DZ01153950		Fresh cooling water cooler - Clean
33				O-ring	1	DZ01153849		Fresh cooling water cooler - Clean
34				Gasket	1	DZ12161783		Fresh cooling water cooler - Clean
35				Packing compound	1	DZ01016253		Fresh cooling water cooler - Clean

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
36				Insulator	4	DZ12154044		Flexible connections - Renew
37				vibration isolator	4	DZ12154043		Flexible connections - Renew
38				Insulator	2	DZ12154054		Flexible connections - Renew
39				Insulator	4	DZ12154046		Flexible connections - Renew
40				Sealing ring	8	DZ01151323		Compression pressure - Check
41				Gasket	2	DZ12161792		Charge air cooler - Clean
42				Gasket	2	DZ12275150		Charge air cooler - Clean
43				O-ring	2	DZ01153835		Charge air cooler - Clean
44				Carbon brushes	1	DZ12030138		Carbon brushes and pinion of starter - Renew
45				Pinion	1	DZ12156103		Carbon brushes and pinion of starter - Renew
46				Carbon brushes	1	DZ12155499		Carbon brushes dynamo - Renew
47				Spring lock washer	1	DZ01178307		Injection timing - Check
48	4	232 3 110	34	Cylinder liner, standard	8	DZ12160852	Inspection dependable	Cylinder liners - Check
49	4	232 3 110	35	O-ring	24	DZ01153598	Inspection dependable	Cylinder liners - Check
50	8	232 5 150	6	Valve seat insert	16	DZ12189275		Cylinder heads - Overhaul
51	8	232 5 150	7	Valve guide	16	DZ12161045		Cylinder heads - Overhaul
52	8	232 5 150	8	Valve	16	DZ12161306		Cylinder heads - Overhaul
53	8	232 5 150	13	Rotocap	16	DZ12151490		Cylinder heads - Overhaul
54	8	232 5 150	14	Compression spring	8	DZ01222079		Cylinder heads - Overhaul
55	8	232 5 150	15	Compression spring	8	DZ01222033		Cylinder heads - Overhaul
56	8	232 5 150	25	Cylinder head gasket	8	DZ12161850		Cylinder heads - Overhaul
57	8	232 5 150	27	O-ring	16	DZ01153911		Cylinder heads - Overhaul
58	8	232 5 150	30	Gasket	8	DZ01222705		Cylinder heads - Overhaul
59	8	232 5 150	26	O-ring	16	DZ01153905		Cylinder heads - Overhaul
60	8	232.0.602	18	Starting air valve	8	DZ12151969	Inspection dependable	Cylinder heads - Overhaul
61	8	232.0.602	19	Screw connection	8	DZ12161137		Cylinder heads - Overhaul
62	8		12	Sealing ring	16	DZ01118737		Cylinder heads - Overhaul
63	8		38	O-ring	16	DZ01153913		Cylinder heads - Overhaul

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job
64	21	232 3 341	1	Fuel pressure pipe	1	DZ12161995		Injection pipes - Renew
65	21	232 3 341	2	Fuel pressure pipe	1	DZ12161996		Injection pipes - Renew
66	21	232 3 341	3	Fuel pressure pipe	1	DZ12161997		Injection pipes - Renew
67	21	232 3 341	4	Fuel pressure pipe	1	DZ12161998		Injection pipes - Renew
68	21	232 3 341	5	Fuel pressure pipe	1	DZ12161999		Injection pipes - Renew
69	21	232 3 341	6	Fuel pressure pipe	1	DZ12162000		Injection pipes - Renew
70	21	232 3 341	7	Fuel pressure pipe	1	DZ12162001		Injection pipes - Renew
71	21	232 3 341	8	Fuel pressure pipe	1	DZ12162002		Injection pipes - Renew

These lists are not engine specific. Always double check in Depic if a part is used in the specific engine to maintain!

Remark: the quantity of the mentioned maintenance parts are for engines with eight cylinders!

10. Maintenance parts E70

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job description
1	15			Packing ring	2	DZ01118718		Lubricating oil filling - Renew
2	15			Packing ring	2	DZ01118688		Lubricating oil filling - Renew
3	15	232.4.256	2	Filter cartridge	2	DZ01174421		Oil bath air filter - Clean
4	15	232.1.258	6	Collar	1	DZ12155693		Lubricating oil centrifuge - Clean
5	15			Packing ring	1	DZ03474852		Lubricating oil centrifuge - Clean
6	15			Packing ring	1	DZ12154580		Lubricating oil centrifuge - Clean
7	37	232.3.701		Zink anode	2	DZ01222409		Zinc protective elements - Check
8	37	232.3.701	19	Sealing ring	2	DZ01157700		Zinc protective elements - Check
9				Sealing ring	2	DZ01157670		Zinc protective elements - Check
10				Zink anode	2	DZ01222410		Zinc protective elements - Check
11			170	V-belt	1	DZ01154353		V-belt - Check
12			70	V-belt	1	DZ01175974		V-belt - Check
13	08	232.3.331	8	Sealing ring	16	DZ01117515		Injection nozzles - Check
14	08	232.3.331	4	Helical spring	8	DZ01148247		Injection nozzles - Check
15	08	232.3.331	12	Nozzle tip	8	DZ12152949		Injection nozzles - Check
16	20	232.0.314	7	Sealing ring	2	DZ01118641		Fuel filter elements - Renew
17	20	232.0.314	4	Sealing ring	2	DZ01118713		Fuel filter elements - Renew
18	20	232.0.314	10	Sealing ring	2	DZ12154530		Fuel filter elements - Renew
19	20	232.0.314	25	Filter cartridge	2	DZ01175893		Fuel filter elements - Renew
20				Gasket	4	DZ12164783		Exhaust gas pipes - Clean
21				O-ring	8	DZ01153835		Exhaust gas pipes - Clean
22				Sealing ring	6	DZ01222820		Thermostats - Check
23				Thermostat	2	DZ12152726		Thermostats - Check
24				O-ring	4	DZ01171417		Fresh cooling water cooler - Clean
25				O-ring	2	DZ01153950		Fresh cooling water cooler - Clean
26				O-ring	1	DZ01153849		Fresh cooling water cooler - Clean
27				Gasket	1	DZ12161783		Fresh cooling water cooler - Clean
28				Packing compound	1	DZ01016253		Fresh cooling water cooler - Clean
29				Insulator	4	DZ12154044		Flexible connections - Renew
30				vibration isolator	4	DZ12154043		Flexible connections - Renew
31				Insulator	2	DZ12154054		Flexible connections - Renew
32				Insulator	4	DZ12154046		Flexible connections - Renew
33				Sealing ring	8	DZ01151323		Compression pressure - Check
34				Gasket	2	DZ12161792		Charge air cooler - Clean
35				Gasket	2	DZ12275150		Charge air cooler - Clean
36				O-ring	2	DZ01153835		Charge air cooler - Clean

10. Maintenance parts E70

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job description
37				Carbon brushes	1	DZ12030138		Carbon brushes and pinion of starter - Renew
38				Pinion	1	DZ12156103		Carbon brushes and pinion of starter - Renew
39				Carbon brushes	1	DZ12155499		Carbon brushes and pinion of starter - Renew
40				Spring lock washer	1	DZ01178307		Injection timing - Check
41	4	232 3 110	34	Cylinder liner, standard	8	DZ12160852		Cylinder liners - Check
42	4	232 3 110	35	O-ring	24	DZ01153598		Cylinder liners - Check
43	8	232 5 150	6	Valve seat insert	16	DZ12189275		Cylinder heads - Overhaul
44	8	232 5 150	7	Valve guide	16	DZ12161045		Cylinder heads - Overhaul
45	8	232 5 150	8	Valve	16	DZ12161306		Cylinder heads - Overhaul
46	8	232 5 150	13	Rotocap	16	DZ12151490		Cylinder heads - Overhaul
47	8	232 5 150	14	Compression spring	8	DZ01222079		Cylinder heads - Overhaul
48	8	232 5 150	15	Compression spring	8	DZ01222033		Cylinder heads - Overhaul
49	8	232 5 150	25	Cylinder head gasket	8	DZ12161850		Cylinder heads - Overhaul
50	8	232.0.602	18	Starting air valve	8	DZ12151969		Cylinder heads - Overhaul
51	8	232.0.602	19	Screw connection	8	DZ12161137		Cylinder heads - Overhaul
52	21	232 3 341	1	Fuel pressure pipe	1	DZ12161995		Injection pipes - Renew
53	21	232 3 341	2	Fuel pressure pipe	1	DZ12161996		Injection pipes - Renew
54	21	232 3 341	3	Fuel pressure pipe	1	DZ12161997		Injection pipes - Renew
55	21	232 3 341	4	Fuel pressure pipe	1	DZ12161998		Injection pipes - Renew
56	21	232 3 341	5	Fuel pressure pipe	1	DZ12161999		Injection pipes - Renew
57	21	232 3 341	6	Fuel pressure pipe	1	DZ12162000		Injection pipes - Renew
58	21	232 3 341	7	Fuel pressure pipe	1	DZ12162001		Injection pipes - Renew
59	21	232 3 341	8	Fuel pressure pipe	1	DZ12162002		Injection pipes - Renew
60				Gasket set bare engine	1	DZ02929908		
61	01	232.4.115	16,60	Rot. shaft lip seal	2	DZ12152280		Crankshaft seals - Replace
62	01	232.4.115	45	Sealing ring	1	DZ12152274		Crankshaft seals - Replace
63	06	232 4 141	26	Big end bearing	8	DZ12161295	Standard	Connecting rod and main end bearing - Renew
64	06	232 4 141	23	Connecting rod bush (small end)	8	DZ12161296		Connecting rod and main end bearing - Renew
65	06	232 4 141	22	Big end bolt	16	DZ12161131		Connecting rod and main end bearing - Renew
66	01	232 3 110	43	Main bearing, complete	5	DZ12161294	Standard	Connecting rod and main end bearing - Renew
67	01	232 3 110	59	Ring half	2	DZ12161052	Standard	Connecting rod and main end bearing - Renew
68	01	232 3 110	6	Hexagon screw	10	DZ12166178		Connecting rod and main end bearing - Renew
69	01	232 3 110	7	Expansion screw	10	DZ12161112		Connecting rod and main end bearing - Renew
70	01	232 3 110	8	Bearing bush	2	DZ12161304		Bearings of mass-balancing device - Renew
71	01	232 3 110	46	Bearing bush	1	DZ12313196		Bearings of mass-balancing device - Renew
72	05	232 4 120	6	Hexagon screw	8	DZ01153791		Crankshaft - Check
73	05	232 4 120	15	Vibration damper	1	DZ12161645		Vibration dampers - Replace
74	05	232 4 120	11	Hexagon screw	6	DZ01153607		Vibration dampers - Replace

10. Maintenance parts E70

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job description
75	07			Piston	8	DZ12160877		Pistons - Check
76				Set of piston rings	8	DZ12160753		
77	07			Circlip	16	DZ01214661		Pistons - Check
78	11	232 3 130	19	Mushroom tappet	16	DZ12160984		Camshaft - Check
79	01	232 3 110	47	Bearing bush	4	DZ12313195		Camshaft - Check
80	14	232 3 202	1	Oil gear pump, complete	1	DZ12161682		Lubricating oil pump - Replace
81	15	232 4 256	3	Valve complete	1	DZ12151952		Lubricating oil cooler - Clean
82	17	232 3 303	1	Fuel delivery pump	1	DZ12152604		Injection pump, injection pump drive and coupling - Overhaul
83	17	232 5 321	3	Injection pump complete	1	DZ12152451	To be sent for overhaul	Injection pump, injection pump drive and coupling - Overhaul
84	17	232 5 321	116	Flexible pipe	1	DZ12164232		Injection pump, injection pump drive and coupling - Overhaul
85	18	232 4 360	4	Grooved ball bearing	1	DZ01108988		Injection pump, injection pump drive and coupling - Overhaul
86	18	232 4 360	5	Grooved ball bearing	1	DZ01109044		Injection pump, injection pump drive and coupling - Overhaul
87	18	232.0.602	6	Gasket	1	DZ12161829		Injection pump, injection pump drive and coupling - Overhaul
88	20		99	Flexible pipe	3	DZ12150752		Injection pump, injection pump drive and coupling - Overhaul
89	20		94	Flexible pipe	1	DZ15083929		Injection pump, injection pump drive and coupling - Overhaul
90	20		95	Flexible pipe	1	DZ12162326		Injection pump, injection pump drive and coupling - Overhaul
91	20		96	Flexible pipe	5	DZ12163738		Injection pump, injection pump drive and coupling - Overhaul
92	20		97	Flexible pipe	5	DZ15083953		Injection pump, injection pump drive and coupling - Overhaul
93	20	232.0.314	17	Pressure spring	1	DZ12155066		Injection pump, injection pump drive and coupling - Overhaul
94	20	232.0.314	18	O-ring	1	DZ12156209		Injection pump, injection pump drive and coupling - Overhaul
95	20	232.0.314	20	O-ring	1	DZ12156210		Injection pump, injection pump drive and coupling - Overhaul
96	22	232.4.115	29	Vent pipe	1	DZ12162376		Crankcase breather - Renew
97	37		1	Fresh water pump, complete	i.d.(1)	DZ12279016		Cooling water pumps - Replace
98	37		3	Impeller	1	DZ12161258		Cooling water pumps - Replace
99	37		8	Bearing seal	1	DZ12151482		Cooling water pumps - Replace
100	37		11	Ball bearing	2	DZ01152825		Cooling water pumps - Replace
101	37			Raw water pump, complete	i.p.(1)	DZ12152694		Cooling water pumps - Replace
102	37			O-ring	2	DZ01153835		Cooling water pumps - Replace
103	37			O-ring	1	DZ01161088		Cooling water pumps - Replace
104	37			O-ring	3	DZ01153901		Cooling water pumps - Replace
105	37	05094064	3	Sealing ring	1	DZ12154546		Cooling water pumps - Replace
106	37	05094064	6	Ball bearing	1	DZ12155576		Cooling water pumps - Replace
107	37	05094064	8	Circlip	1	DZ01107844		Cooling water pumps - Replace
108	37	05094064	9	Ball bearing	1	DZ01117023		Cooling water pumps - Replace

10. Maintenance parts E70

Ref	CG	Table	Pos	Description	Qt	Part no	Remarks	Job description
109	37	05094064	11	Gasket	1	DZ12154856		Cooling water pumps - Replace
110	37	05094064	13	Gasket	1	DZ12156402		Cooling water pumps - Replace
111	37	05094064	16	Impeller	1	DZ12156036		Cooling water pumps - Replace
112	37	05094064	20	Parallel key	1	DZ12155096		Cooling water pumps - Replace
113	37	05094064	22	Stud	3	DZ12156825		Cooling water pumps - Replace
114	37	05094064	26	Sealing ring	1	DZ12154545		Cooling water pumps - Replace
115	37	05094064	28	Sealing ring	1	DZ12154547		Cooling water pumps - Replace
116	37	05094064	32	Snap ring	1	DZ12156370		Cooling water pumps - Replace
117	36		21	O-ring	1	DZ01173375		Cooling water pumps - Replace
118	36		90	Hose	1	DZ01154277		Cooling water pumps - Replace
119	36		105	Hose clip	2	DZ01177986		Cooling water pumps - Replace
120	36		120	Hose	2	DZ01154140		Cooling water pumps - Replace
121	36		140	Hose	2	DZ12161870		Cooling water pumps - Replace
122	36		145	Hose	1	DZ01154126		Cooling water pumps - Replace
123	36		145	Bend	1	DZ12158640		Cooling water pumps - Replace
124	36		150	Hose clip	11	DZ01133878		Cooling water pumps - Replace
125	36		160	Rubber sleeve	2	DZ01154144		Cooling water pumps - Replace
126	36		165	Hose clip	4	DZ12151677		Cooling water pumps - Replace
127	38		100	O-ring	3	DZ01181871		Cooling water pumps - Replace
128	38		105	O-ring	1	DZ01160620		Cooling water pumps - Replace
129	38		145	Packing ring	1	DZ01222776		Cooling water pumps - Replace
130	38		60	Rubber sleeve	2	DZ12161873		Cooling water pumps - Replace
131	43	232 1 750	28	Piece of tube	2	DZ12161879		Turbocharger - Renew
132	43	232 1 750	31	Hose clip	6	DZ12151622		Turbocharger - Renew
133	43	232 1 750	57	Piece of tube	2	DZ12161880		Turbocharger - Renew
134	43	232 1 750	58	Hose clip	8	DZ01169602		Turbocharger - Renew
135	43	232 1 750	83	Piece of tube	2	DZ12161887		Turbocharger - Renew
136	43	232 1 750	84	Hose clip	4	DZ01166367		Turbocharger - Renew
137	43	232 3 701	2	Rubber tube	2	DZ01154152		Turbocharger - Renew
138	43	232 3 701	4	Hose clip	4	DZ01166420		Turbocharger - Renew
139	43	232 3 701	24	Drain valve	2	DZ12188643		Turbocharger - Renew
140	43			Turbocharger	2	DZ12152905	To be sent for overhaul	Turbocharger - Renew

These lists are not engine specific. Always double check in Depic if a part is used in the specific engine to maintain!

Remark: the quantity of the mentioned maintenance parts are for engines with eight cylinders!