



TA 1310-0010-2

Technical Instruction

Special tools catalogue Type 4



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1 Scope

This Technical Instruction (TA) applies to the following Jenbacher Engines:

- Type 4 engines

2 Purpose

This technical instruction (TA) contains a list of available special tools required for work on Jenbacher Engines.

3 Safety information

DANGER



Personal injury due to damaged tools

If tools are not inspected at regular intervals, severe personal injury may result.

- Tools marked yellow in the tool kit overview must be inspected regularly at intervals of no more than one year. The markings are based on the periodicity at INNIO in Austria, but if local regulations are stricter, the frequency and scope of the inspection must be changed accordingly.

WARNING



Personal injury

Failure to use personal protective equipment and comply with safety instructions or employee protection information may lead to personal injury.

- Wear the relevant personal protective equipment (PPE).
- Observe the safety instructions as per TA 2300-0005.
- Observe the employee protection information as per TA 2300-0001.

4 Additional information

NOTE



Engine damage due to uncalibrated measuring instruments

If measuring instruments are not calibrated at the set intervals, this can result in engine damage due to incorrect measurement results.

- Calibrate measuring instruments at the intervals specified by the manufacturer.

Relevant documents:

TA 1310-0011 – Standard tool catalogue

TA 2300-0001 – Employee protection

TA 2300-0005 – Safety instruction

5 General

Custom products within this catalogue are used exclusively by the company GE Jenbacher (DP) GmbH & CO OG and manufactured by its subcontractors.

The special equipment and tools contained in this catalogue are to be used in accordance with the relevant regulations and TIs and must not be used by persons without the predetermined certified training.

The training required for working on engines using the special tools from Jenbacher is indicated in the Tool kits Section below. The abbreviations used there refer to the following list.

Training title (Trg)	Abbr.
Maintenance and repair training for Type 3 engines	MR3
Maintenance and repair training for Type 4 engines	MR4
Maintenance and repair training for Type 6 engines	MR6

Training title (Trg)	Abbr.
J624 training	624
ITH flywheel training - manufacturer training only with special approval	ITH

Recommendation on minimum requirements for special tools

Recommendations about minimum requirements of special tools for Jenbacher Engines serve as planning aids for our service partners.

The minimum requirements ensure that the fleet installed in a country can be serviced sufficiently and over the whole area.

To do this, the following categories are assigned to the special tools:

Abbreviation category	Designation category	Description
PREV	Preventive tool	Special tools for the activities provided for in the maintenance schedule – Preventive measures. Tools of this category may also be necessary for corrective actions.
CORR	Corrective tool	Special tool for corrective actions.
SISP	Plant-specific tool	Plant-specific tools are special tools of individual plants or devices that are required for service depending on the condition of the customer's plants.
ACCY	Accessories	Optional accessories for proper storage and safe transport of special tools.

The following list shows the recommended minimum quantities of special tools in relation to the number of motors installed in the country.


Number of motors per type in the country	Preventive tools (PREV)	Corrective tools (CORR)
<20	1	1
<50	2	1
<70	2	2
<100	3	2
<150	3	3
<200	4	3
<500	5	3
<800	5	4
<1200	6	4



The specified minimum quantities assume proper and good planning as well as trouble-free transport possibilities throughout the country. Deviations or countries larger than 800,000 km² may require larger quantities.


6 Changes

Charge cooler lifting plate BR4 - PREV

1238310	Charge cooler lifting plate BR4	Lifting plate to mount on the charge cooler in order to facilitate lifting	
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Weight: 15 kg
Dimensions: 650x280x250 mm

Bearing removal tool TecJet - PREV

1242638	Bearing removal tool TecJet	To remove the bearings of the TecJet	
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Weight: -- kg
Dimensions: -- x -- x -- mm

Battery light source for borescope - PREV

1248655	Battery light source for borescope	alternative light source for borescope part no.: 1218442, wireless handling	
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Weight: -- kg
Dimensions: -- x -- x -- mm

Rigid borescope with LED - PREV

1218442	Rigid borescope with LED	for finding e.g. combustion chambers, incl. LED light source, camera and carrying case	
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Weight: -- kg
Dimensions: -- x -- x -- mm

Videoscope - PREV

1248638	Videoscope	For diagnostic purposes with interchangeable lens, 2 batteries and accessories in carrying	
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		case Alternatively part no.: 1226502	
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Weight: -- kg
Dimensions: -- x -- x -- mm

Hand chain hoist for I-beam - SISP

1247710	Hand chain hoist for I-beam	Hand chain hoist for BR4 D/E container applications with I-rail, load capacity: 1,000 kg	
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Weight: --- kg
Dimensions: --- mm

7 Tool kits

WARNING



Personal injury due to untested tools

- If tools are not inspected at regular intervals, personal injury caused by tools may result.
- Inspect tools highlighted in yellow in the overview at regular intervals of no more than one year.
 - The markings are based on the periodicity at INNIO in Austria, but if local regulations are stricter, the frequency and scope of the inspection must be changed accordingly.



Spare parts for complete kits are marked with a "-". They are included in the complete kit, but can also be ordered separately.

If a value has been entered for tools in the sub-assembly column, the entire sub-assembly must be ordered. The individual parts cannot be used on their own.

Special tool	Part number	Training	Number	Module
Type 4 - Power unit [CYLM/4/XX/000/01-01] - PREV				
<i>Ratchet 3/4"</i>	1203601		1	
<i>Hinged socket 24 mm</i>	1208498	MR4	1	
<i>Bent ring spanner 24 mm</i>	1208499	MR4		
<i>Case</i>	1208506		1	
<i>Foam insert</i>	1209653		1	
<i>Lifting tool for pistons</i>	1213517		1	
<i>Circlip pliers</i>	1222155		1	
<i>Piston ring pliers</i>	1222813		1	
<i>Deep hexagonal socket, AF 36</i>	1231825		1	
<i>Position gauge for piston cooling on Type 4 engines</i>	292420		1	
<i>Torque angle indicator</i>	295308		1	
<i>Cylinder liner extractor</i>	340978	MR4	1	
<i>Deep hexagonal socket, AF 34</i>	360419		1	

Special tool	Part number	Training	Number	Module
Position gauge for roller tappet guide	457172		1	
Valve spring compression tool – Type 4 engines	7003486		1	
Protective tube, Type 2, 3 and 4 engines	9014391		1	
Tappet - installation and removal device	9022607	MR4	1	
Brass washer bearing	9024510		1	
Insertion sleeve for pistons	9032162	MR4	1	

Types 3, 4 – Hydraulics [CYLH/34/xx/000] - PREV

Bolt-tensioner	---	MR4	4	
Type 3, 4 - Hydraulic system	422734	MR3;MR4	1	
- Face spanner	1209979		1	
- Manometer for hydraulic hand pump ITH	1234344		1	
- High-pressure hand pump, 1350 bar	426575		1	
- High-pressure hose 2m	426578		4	
- High-pressure hose 3 m	426579		1	
- High-pressure coupling distributor (4-way)	426580		1	

Types 2, 3, 4, 6 – Crankshaft seal [SEAL/2346/XX/000] - PREV

Case	1208506		1	
Foam insert	1209888		1	
Stud M16x1.5	156911	MR3;MR4; MR6	1	
Assembly aid for fitting the crankshaft seal on Type 2, 3, and 4 engines	165952	MR3;MR4	1	
Assembly sleeve	285455		1	
PVC ring for pre-assembly	315403	MR3;MR4; MR6	1	

Engine type 4 – Crane [MCRA/4/XX/000] - SISP

Mobile gantry crane engine type 4	1218505	MR4	1	
Hand chain hoist	1247710	MR4	1	
Extension rail	7004375		1	

Type 4 – Basic unit – Lifting equipment [HELD/4/XX/000/01-01] - PREV

Basic unit - lifting equipment	1220982	MR4	1	
BR adapter, lifting equipment	1220984	MR4	1	

Type 4 – Main bearing [MBAK/4/xx/000] - PREV

Deep hexagonal socket, AF 36	1231825		1	
Deep hexagonal socket, AF 34	360419		1	
Main bearing removal tool	9023213		1	
Crankcase spreader mechanical	9029682	MR4	1	

Special tool	Part number	Training	Number	Module
Blow-by meter [BBMD/346/XX/000/01-01] - PREV				
<i>Blow-by meter hose</i>	1210773		2	
<i>Blow-by meter</i>	1230601		1	
Camshaft tool – Type 4 engines - CORR				
<i>- Camshaft gear puller</i>	7003476	MR4	1	
<i>- Camshaft timing gear, assembly aid</i>	7003510	MR4	1	
Type 4 - Thrust bearing drilling template - CORR				
<i>Thrust bearing drilling template, Type 4 engines</i>	1228035	MR4	1	
Type 4 – Exhaust gas sampling probe [SEGM/4/XX/000] - PREV				
<i>Copper sealing ring</i>	100639		20	
<i>Individual exhaust-gas sampling probe</i>	1236953		20	
<i>Measuring line</i>	1237149		1	
Gear train – Slotted wrench [GEAR/4/XX/000] - CORR				
<i>Slotted nut socket M24</i>	1215789	MR4	1	
<i>Slotted nut socket M35</i>	1215798	MR4	1	
Combustion chamber cleaning - CORR				
<i>O-ring</i>	100022		1	
<i>Combustion chamber cleaning consumables</i>	1242666		1	
Type 4 – Steel piston tool [CYLS/4/XX/000] - PREV				
<i>Position gauge for piston cooling nozzles on Type 4 engines with steel pistons</i>	1200702	MR4	1	
<i>Insertion sleeve for steel pistons</i>	1200704	MR4	1	
Spark Plug Tool [SPAT/6/xx/000] - PREV				
<i>Spark plug adjustment tool</i>	1233810		1	
<i>Extension magnet for reinforcing the spark plug socket wrench</i>	1237586		1	
Type 4 – Vibration damper [DAMP/4/XX/000] - PREV				
<i>Vibration damper - installation tool for Type 4 engines</i>	7003865	MR4	1	
Single tools - PREV / CORR				
<i>Shaft alignment laser device</i>	1235971		1	
<i>Hydraulic lifting cylinder</i>	1235972		1	
<i>Vibration measuring instrument</i>	1238948		1	
<i>Accumulator pump for ITH hydraulic system</i>	1241906		1	

Special tool	Part number	Training	Number	Module
<i>Torque screwdriver</i>	1242516	MR3;MR4; MR6	1	
<i>Bearing removal tool TecJet</i>	1242638		1	
<i>Coupling element replacement tool</i>	9029785		1	
Examination				
<i>Rigid borescope with LED</i>	1218442		1	
<i>Videoscope</i>	1248638		1	
<i>Battery light source for borescope</i>	1248655		1	
BR4 - Venturi ring removal tool				
<i>Filter</i>	1224427	MR4	1	


8 Special tool

8.1 Type 3, 4 - Hydraulic system




The complete kit includes all tools mentioned below. All tools with a part number can also be ordered as spare parts.

Type 3, 4 - Hydraulic system - PREV

422734	Type 3, 4 engines - hydraulic system	Complete kit	
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Weight: 75 kg
Dimensions: 790 x 620 x 440 mm

The hydraulic system for Type 3 and 4 engines consists of the following tools:

-	Bolt-tensioner	Weight: 2 kg Dimensions: 68x78x138 mm	
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-	Adapter bushing M20x2.5	Weight: 0.6 kg Dimensions: 53x53x102 mm	
-	Adapter bushing M22x2.5	Weight: 0.6 kg Dimensions: 53x53x102 mm	
-	Support sleeve M20x2.5	Weight: 1.0 kg Dimensions: 63x64x113 mm	
-	Support sleeve M22x2.5	Weight: 1.0 kg Dimensions: 63x64x113 mm	
-	Supporting plate	Weight: 0.8 kg Dimensions: 50x50x90 mm	

Face spanner - PREV

1209979	Face spanner	For opening the bolt-tensioners for replacing the adapter bushings	
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Weight: 0.8 kg
Dimensions: 220x40x20 mm

High-pressure hand pump, 1350 bar - PREV

426575	High-pressure hand pump, 1350 bar	For building up pressure for the bolt-tensioner	
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Weight: 9.2 kg
Dimensions: 620x260x240 mm

High-pressure coupling distributor (4-way) - PREV

426580	High-pressure coupling distributor (4-way)	For equal distribution of pressure across the four bolt-tensioners	
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Weight: 1.8 kg
Dimensions: 150x200x30 mm

High-pressure hose, 2m - PREV

426578	High-pressure hose, 2m	Connecting hose from the pump to the distributor	
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Weight: 1.6 kg
Dimensions: 30x30x2000 mm

Manometer for hydraulic hand pump ITH - PREV

1234344	Manometer for hydraulic hand pump ITH	Spare part Monometer for hydraulic hand pump ITH 426575, display pane 1600 bar	
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Weight: 1.1 kg
Dimensions: 145x110x60 mm


High-pressure hose, 3 m - PREV

426579	High-pressure hose, 3 m	Connecting hose from the pump to the distributor	
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Weight: 2.4 kg
Dimensions: 30x30x3000 mm


8.2 Type 4 - Power Unit

Ratchet 3/4" - PREV

1203601	Ratchet 3/4"	For fitting and removing cylinder head bolts ⇒ to be used in combination with torque angle indicator	
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Weight: 2.6 kg
Dimensions: 700x70x60 mm

Hinged socket 24 mm - PREV

1208498	Hinged socket 24 mm	For removing intake system mounting bolts	
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Weight: 0.2 kg
Dimensions: 40x40x80 mm

Bent ring spanner 24 mm - PREV

1208499	Bent ring spanner 24 mm	For loosening intake system mounting bolts	
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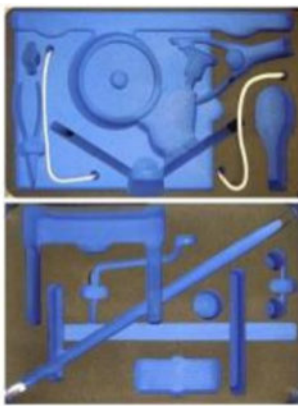
Weight: 0.4 kg
Dimensions: 40x90x240 mm

Case - ACCY

1208506	Case		
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Weight: 5.4 kg
Dimensions: 580x380x260 mm

Foam insert - ACCY

1209653	Foam insert	Type 4 engine power unit tool kit	
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Weight: 0.4 kg
Dimensions: 560 x 360 x 240 mm

Lifting tool for pistons - PREV

1213517	Lifting tool for pistons	Fitting and dismantling aid for pistons with heart and kidney-shaped chambers	
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Weight: 0.8 kg
Dimensions: 200x90x60 mm

Circlip pliers - PREV

1222155	Circlip pliers	For fitting and removing circlips	
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Weight: 0.2 kg
Dimensions: 190x50x20 mm
Details: Gedore J2
Manufacturer part no.: 6703400

Piston ring pliers - PREV

1222813	Piston ring pliers	For fitting and removing piston rings	
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Weight: 0.4 kg
Dimensions: 210x130x20 mm
Details: Gedore 127
Manufacturer part no.: 6397610

Deep hexagonal socket, AF 36 - PREV

1231825	Deep hexagonal socket, AF 36	Required for working on the main bearings of Type 4 engines	
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Weight: 0.8 kg
Dimensions: 60 x 60 x 90 mm

Position gauge for piston cooling on Type 4 engines - PREV

292420	Position gauge for piston cooling on Type 4 engines	for checking the position of the piston cooling nozzles	
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Weight: 2.4 kg
Dimensions: 440 x 220 x 220 mm
Application: This device is to be used according to the relevant instructions for the various engine types


Torque angle indicator - PREV

295308	Torque angle indicator	For precisely determining the tightening torque using the angle gauge	
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Weight: 1.0 kg
Dimensions: 140x180x80 mm
Application:

- Tighten the bolt to the specified torque
- Place the torque angle indicator on the bolt
- Finally tighten the bolt using the angle scale


Insertion sleeve for pistons - PREV

9032162	Insertion sleeve for pistons	Tool for installing pistons into the cylinder liner in Type 4 engines	
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Weight: 1.6 kg

Dimensions: 170x80 mm

Cylinder liner extractor - PREV


340978	Cylinder liner extractor	Dismantling cylinder liner from engine block	
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Weight: 6.6 kg

Dimensions: 640x260x350 mm

Application: Fit the bridge to the cylinder head bolts and pull out the liner (using a threaded rod and attached crank handle)


Tappet - installation and removal device

340983	Tappet - installation and removal device	For disassembly and assembly of roller tappets	
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Weight: 0.2 kg

Dimensions: 500x40x40 mm


Deep hexagonal socket, AF 34 - PREV

360419	Deep hexagonal socket, AF 34	For undoing cylinder head bolts	
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Weight: 1.0 kg

Dimensions: 60 x 60 x 90 mm


Position gauge for roller tappet guide - PREV

457172	Position gauge for roller tappet guide	For inspecting the installation position of the roller tappet guide	
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Weight: 1.2 kg


Dimensions: 120x100x40 mm

Valve spring compression tool – Type 4 engines - PREV

7003486	Valve spring compression tool – Type 4 engines	For compressing the valve springs in order to replace the valves	
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Weight: 2.5 kg
Dimensions: 126x250x150 mm


Brass washer bearing - PREV

9024510	Brass washer bearing	For easier removing the cylinder liner	
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Weight: 0.09 kg
Dimensions: 60x60x5 mm

Tappet - installation and removal device - PREV

Weight: 0.18 kg
Dimensions: 507x32x32 mm

9022607	Tappet - installation and removal device	For disassembly and assembly of bucket tappets	
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Protective tube, Type 2/3/4 engines - PREV

9014391	Protective tube, Type 2, 3 and 4 engines	For protecting the crankpin while the conrod is removed	
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Weight: 0.5 kg
Dimensions: 110x110x38 mm

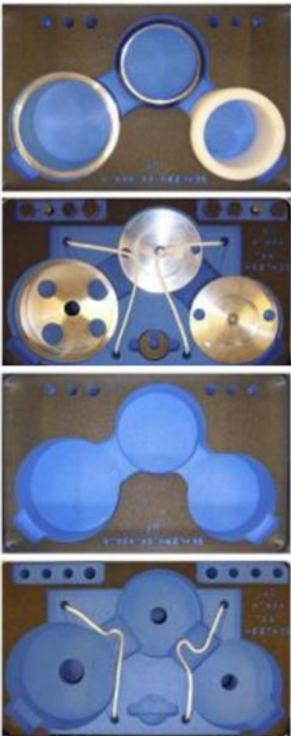
8.3 Type 2, 3, 4, 6 - Crankshaft seal

Case - ACCY

1208506	Case		
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Weight: 5.4 kg
Dimensions: 580x380x260 mm

Foam insert - ACCY

1209888	Foam insert	Type 2, 3, 4, 6 engines - crankshaft seal tool kit	
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Weight: 0.4 kg
Dimensions: 560 x 360 x 240 mm

Stud M16x1.5 - PREV

156911	Stud M16x1.5	For fitting and removing the flywheel as well as dampers	
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Weight: 0.6 kg
Dimensions: 20x20x150 mm




Assembly aid for fitting the crankshaft seal on Type 2, 3, and 4 engines - PREV

165952	Assembly aid for fitting the crankshaft seal on Type 2, 3, and 4 engines		
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Weight: 21.7 kg
Dimensions: 310 x 310 x 210 mm

The assembly aid for fitting the crankshaft seal on Type 2, 3, and 4 engines consists of the following tools:

-	Spacer sleeve	Spacer sleeve for fitting the Simmerring (damper end)	
-	Assembly flange	Flange for pressing on the Simmerring or spacer sleeve	


-	Mounting bracket at damper end	For fitting the Simmerring at the damper end (⇒ usage in combination with assembly flange and assembly sleeve)	
-	Mounting plate at flywheel end	For fitting the Simmerring seal at the flywheel end (⇒ usage in combination with assembly flange, assembly sleeve and spacer sleeve)	
-	Assortment of bolts	2x bolt M16x1.5-90 hexagonal 2x bolt M16x1.5-170 hexagonal 2x bolt M16x1.5-200 hexagonal Weight: 0.6 kg Dimensions: 30x30x200 mm	

Assembly sleeve - PREV

285455	Assembly sleeve	For fitting the Simmerring on the crankshaft	
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Weight: 1.5 kg
Dimensions: 170x170x80 mm


PVC ring for pre-assembly - PREV

315403	PVC ring for pre-assembly	Expansion of the Simmerring to fit onto crankshaft	
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Weight: 1.3 kg
Dimensions: 170x170x120 mm


8.4 Engine type 4 – Crane

Mobile gantry crane engine type 4 - SISF

1218505	Mobile gantry crane engine type 4		
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Weight: 330 kg
Dimensions: 1200x800x500 mm

Extension rail - SISF

7004375	Extension rail	Extension to 1218505 for increased flexibility	
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Weight: 69 kg
Dimensions: 542 x 414 x 490 mm

Charge cooler lifting plate BR4 - PREV

1238310	Charge cooler lifting plate BR4	Lifting plate to mount on the charge cooler in order to facilitate lifting	
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Weight: 15 kg
Dimensions: 650x280x250 mm

Hand chain hoist for I-beam - SISP

1247710	Hand chain hoist for I-beam	Hand chain hoist for BR4 D/E container applications with I-rail, load capacity: 1,000 kg	
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Weight: --- kg
Dimensions: --- mm

8.5 Types 2, 3, 4 – Basic unit – Lifting equipment




Basic unit - lifting equipment - PREV



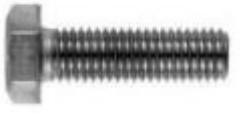

In addition to the lifting equipment basic unit, one of the “lifting equipment adapters” is required, depending on engine type (Type 3 or Type 4).

Weight: 9.2 kg
Dimensions: 620x260x240 mm

The lifting equipment basic unit consists of the following tools:

-	Pump unit with distributor	For building up pressure in the lifting cylinder units Weight: 13.4 kg Dimensions: 910x180x160 mm	
-	High-pressure line 10 m	Connecting hose from pump unit to the respective lifting cylinders Weight: 3.4 kg Dimensions: 20x20x10000 mm	
-	Lifting cylinder unit	Lifting cylinder for lifting the engine Weight: 12.2 kg Dimensions: 430x230x80 mm Application: This cylinder is to be used in accordance with the Technical Instructions	

-	I-beam	<p>Placement under the already raised engine ⇒ safeguard in case of sudden pressure drop</p> <p>Weight: 7.0 kg</p> <p>Dimensions: 810x110x60 mm</p>	
-	Supporting plate	<p>Supporting plate with engine raised ⇒ relieve strain on lifting cylinders</p> <p>Weight: 1.0 kg</p> <p>Dimensions: 120x120x30 mm</p>	
-	Supporting plate with rubber layer	<p>As upper-most and lower-most supporting plate ⇒ protection from slipping</p> <p>Weight: 1.0 kg</p> <p>Dimensions: 120x120x30 mm</p>	
-	Supporting plate with bracket	<p>Lower-most supporting plate for perfect fit on frame</p> <p>Weight: 1.2 kg</p> <p>Dimensions: 120x140x60 mm</p>	
-	Mounting bolt M12	<p>Bolt to fix the adapter plates on the turbo charger end to the crankcase</p> <p>Weight: 0.13 kg</p> <p>Dimensions: 20x20x140 mm</p>	
-	M12x30 mm bolt	<p>Additional bolt for fitting the adapter plate at the flywheel end (screw into depression)</p> <p>Weight: 0.04 kg</p> <p>Dimensions: 20x20x30 mm</p>	
-	M12x35 mm bolt	<p>Bolts for fastening the lifting cylinder to the adapter plates</p> <p>Weight: 0.05 kg</p> <p>Dimensions: 20x20x30 mm</p>	

-	M12x45 mm bolt	Bolts for fitting the adapter plate at the flywheel end to the flywheel housing Weight: 0.1 kg Dimensions: 20x20x30 mm	
-	Flat washer A13	Flat washer for all M12 bolts Weight: 0.02 kg Dimensions: 30x10 mm	

Lifting equipment adapters for Type 4 engines - PREV

1220984	Jacking equipment adapters for Type 4 engines		
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Weight: 80 kg
Dimensions: 800 x 620 x 290 mm

The Type 4 lifting equipment adapter consists of the following tools:

-	Lifting block for damper end	Adapter block at damper end for engine lifting gear of Type 4 engines Weight: 40.8 kg Dimensions: 700x300x250 mm	
-	Assembly plate	Plate to fix the lifting block to the engine (damper end) Weight: 4.4 kg Dimensions: 200x200x20 mm	
-	Adapter	Plate to fix the lifting block to the engine (damper end) Weight: 9.4 kg Dimensions: 450x200x30 mm	


8.6 Types 2, 3, 4 – Main bearing

Deep hexagonal socket, AF 34 - PREV

360419	Deep hexagonal socket, AF 34	For undoing cylinder head bolts	
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Weight: 1.0 kg
Dimensions: 60 x 60 x 90 mm

Deep hexagonal socket, AF 36 - PREV

1231825	Deep hexagonal socket, AF 36	Required for working on the main bearings of Type 4 engines	
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Weight: 0.8 kg
Dimensions: 60 x 60 x 90 mm

Crankcase spreader mechanical - PREV

9029682	Crankcase spreader mechanical	To spread the crankcase to lower the main bearing cap.	
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Weight: --- kg
Dimensions: --- mm


Main bearing removal tool - PREV

9023213	Main bearing extractor	For removing the upper main bearing	
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Weight: 0.07 kg
Dimensions: 189x50x18 mm


8.7 Blow-by meter

Blow-by meter

1230601	Blow-by meter	For measuring the blow-by flow	
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Weight: 5.0 kg
Dimensions: 310 x 280 x 200 mm


Blow-by meter hose - PREV

1210773	Blow-by meter hose	Hose for measuring the blow-by flow. Only for use with the blow-by meter.	
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Weight: --- kg
Dimensions: --- mm


8.8 Type 4 - Thrust bearing drilling template

Thrust bearing drilling template, Type 4 engines - CORR

1228035	Thrust bearing drilling template, Type 4 engines		
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Weight: 5 kg
Dimensions: 280 x 280 x 60 mm

The thrust bearing drilling template for Type 4 engines consists of the following tools:

	Drilling sleeve	Drill guide	
	Thread cutter sleeve	For guiding the thread cutter	
	Nut M8		
	Washer		

8.9 Camshaft tool – Type 4 engines


Camshaft timing gear, assembly aid - CORR

7003510	Camshaft timing gear Assembly aid	For fitting the camshaft timing gear	
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Weight: 2.7 kg

Dimensions: 318x58x58 mm

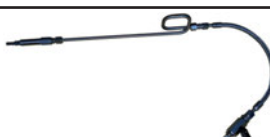
Camshaft gear puller - CORR

7003476	Camshaft gear puller	For pulling out the gear, even with timing cover fitted, Type 4 engines	
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Weight: 2.8 kg
Dimensions: 327 x 85 x 85 mm


8.10 Type 4 engines - Exhaust-gas sampling probe

Individual exhaust-gas sampling probe - PREV

1236953	Individual exhaust-gas sampling probe	for Type 4 engines (sampling line with ball valve and corrugated metal hose)	
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Weight: --- kg
Dimensions: --- mm

Copper sealing ring - PREV

100639	Copper sealing ring	12 x 18 x 1.5 mm	
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Weight: --- kg
Dimensions: --- mm


Measuring line - PREV

1237149	Measuring line	Coupling: Silicone hose (150 mm, inside diameter = 5 mm, outside diameter = 10 mm - transition to measuring probe); PTFE hose (5,000 mm with screw connection, for connecting the individual exhaust-gas sampling probes to the exhaust-gas emission measuring device)	
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Weight: --- kg
Dimensions: --- mm

8.11 BR4 - Venturi ring removal tool


Venturi ring removal tool - PREV

1224427	Venturi ring removal tool	Extractor for the Venturi ring in the intake system	
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Weight: 10 kg
Dimensions: 340x340x700 mm


8.12 Gear train – slotted nut socket

Slotted nut socket M24 - CORR

1215789	Slotted nut socket M24		
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Weight: 0.6 kg
Dimensions: 55x49x49 mm

Slotted nut socket M35 - CORR

1215798	Slotted nut socket M35		
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Weight: 0.8 kg
Dimensions: 65x65x65 mm

8.13 Combustion chamber cleaning**Combustion chamber cleaning consumables**

1242666	Combustion chamber cleaning consumables	Abrasive and brushes for combustion chamber cleaning	
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Weight: --- kg
Dimensions: --- mm


O-ring - CORR

100022	O-ring	To protect against dirt contamination between piston and cylinder liner	
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Weight: --- kg
Dimensions: --- mm


8.14 Single tools

Accumulator pump for ITH hydraulic system - PREV

1241906	Accumulator pump for ITH hydraulic system	For building up pressure for the bolt-tensioner	
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Weight: 14.6 kg
Dimensions: 365x240x470 mm

Torque screwdriver - PREV

1242516	Torque screwdriver	For bolting the generator coupling ring	
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Weight: 7.7 kg
Dimensions: 560 x 265 x 455 mm

Hydraulic lifting cylinder - PREV

1235972	Hydraulic lifting cylinder	For lifting of various loads	
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Weight: 25.2 kg
Dimensions: 360x210x430 mm

Coupling element replacement tool - CORR

9029785	Coupling element replacement tool	for replacing coupling elements, particularly for jammed parts	
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Weight: --- kg
Dimensions: --- mm

Vibration measuring instrument - CORR

1238948	Vibration measuring instrument	For measuring vibrations.	
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Weight: 2.0 kg
Dimensions: 500x300x150 mm

Shaft alignment laser device - PREV

1235971	Shaft alignment laser device	For aligning of the shaft - Generator-gearbox-engine	
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Weight: 7.8 kg
Dimensions: 520x420x190 mm

Bearing removal tool TecJet - PREV


1242638	Bearing removal tool TecJet	To remove the bearings of the TecJet	
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Weight: -- kg

Dimensions: -- x -- x -- mm


8.14.1 Type 4 - Steel piston tool

Insertion sleeve for steel pistons - PREV

1200704	Insertion sleeve for steel pistons	Tool for installing pistons into the cylinder liner in Type 4 engines	
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Weight: 3.0 kg
Dimensions: 190 x 190 x 65 mm


Position gauge for piston cooling nozzles on Type 4 engines with steel pistons - PREV

1200702	Position gauge for piston cooling nozzles on Type 4 engines with steel pistons	For inspecting the position of the piston cooling nozzles	
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Weight: 2.2 kg
Dimensions: 190 x 190 x 390 mm

8.14.2 Type 4 - Vibration damper


Vibration damper - installation tool for Type 4 engines - PREV

7003865	Vibration damper - installation tool for Type 4 engines	Fitting and removal of vibration damper Type 4 engines	
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Weight: 1.1 kg
Dimensions: 145 x 110 x 60 mm
Application: TA 1300-0001


8.14.3 Spark plug tool

Extension magnet for reinforcing the spark plug socket wrench - PREV

1237586	Extension magnet for reinforcing the spark plug socket wrench	Aid for removing spark plugs	
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Weight: 0.11 kg
Dimensions: 81.5 x 20 x 20 mm

Spark plug adjustment tool - PREV

1233810	Spark plug adjustment tool	To adjust the spark plugs P7N1 and P3V3i	
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Weight: --- kg
Dimensions: --- mm

8.14.4 Examination**Battery light source for borescope - PREV**

1248655	Battery light source for borescope	alternative light source for borescope part no.: 1218442, wireless handling	
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Weight: -- kg
Dimensions: -- x -- x -- mm

Rigid borescope with LED - PREV

1218442	Rigid borescope with LED	for finding e.g. combustion chambers, incl. LED light source, camera and carrying case	
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Weight: -- kg
Dimensions: -- x -- x -- mm

Videoscope - PREV

1248638	Videoscope	For diagnostic purposes with interchangeable lens, 2 batteries and accessories in carrying case Alternatively part no.: 1226502	
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Weight: -- kg
Dimensions: -- x -- x -- mm

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10 Revision code

Revision history

Index	Date	Description / Revision summary	Expert Auditor
10	28.11.2019	340983, 9022607 aktualisiert / 340983, 9022607 updated 340977 ersetzt durch 9032162 / 340977 replaced by 9032162 1247710, 1242638, 1238310 hinzugefügt / 1247710, 1242638, 1238310 added Kit „Befundung“ (1248655, 1218442, 1248638) in Einzelwerkzeuge ergänzt / Kit „Examination“ (1248655, 1218442, 1248638) in single tools added Kit „Containerkran“ umbenannt in „Kran“ / Kit “Container crane” renamed to “Crane”	Winterle H. <i>Winterle H.</i>
9	29.03.2019	Kategorisierung der Werkzeuge ergänzt / Categorization of tools added Diverse kleine Anpassungen / Minor adaptations	Winterle H. <i>Winterle H.</i>

Revision history

8	12.10.2018	9004382 hinzugefügt, Kit Abgasentnahmesonde hinzugefügt, Kit Kurbelgehäusespreitzer aufgelöst und in Basiseinheit - Hebelösungen verschoben / 9004382 added, Kit exhaust gas sampling probe added, Kit Crankcase spreader dissolved and moved in the Basic unit - Lifting equipment	Winterle H. <i>Winterle H.</i>
7	29.06.2018	Kits bei Einzelwerkzeuge und 9029785 hinzugefügt / Kits for single tools and 9029785 added	Winterle H. <i>Winterle H.</i>
6	29.03.2018	1242516, 1233810, 1242666 und 100022 hinzugefügt / 1242516, 1233810, 1242666 and 100022 added	Winterle H. <i>Winterle H.</i>
5	21.12.2017	Diverse kleine Anpassungen, 1241906 hinzugefügt / Small adaption, 1241906 added	Winterle H. <i>Winterle H.</i>