This file represents a consolidation of multiple files sent by the manufacturer. Please use the bookmarks to navigate to each file. (Each bookmark label is the name of the original file.)

This file may have been split into multiple files after consolidation. Such files have the suffix “1 of n”appended to the end of the file name.

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	1
Function group	03.10 - Connecting rods, pistons
Date	2/27/15
Validity	Engine 274.920 (LS)
Reason for change	

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration

Cause

Under analysis

Remedy

Please do not replace any components.

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration might be mistaken for an abnormal engine noise.

Create a PTSS case include the 242131584 number in the case TPR field and attach following:

- Short test

- Sound / video file with the engine noise

- Sound / video file with the engine noise while the oil pressure switch (Y130) is disconnected

- Check for any debris in engine oil and attach illustration if any

- Provide information whether noise diminishes while engine runs at operating temperature

The case will be forwarded to engineering and the next steps determined at that time.

Symptoms
Power generation > Engine noise > Noise

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	2
Function group	03.10 - Connecting rods, pistons
Date	3/16/15
Validity	Engine 274.920 (LS)
Reason for change	Remedy revised include LI number

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration

Cause

Under analysis

Remedy

Please do not replace any components.

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration might be mistaken for an abnormal engine noise.

Create a PTSS case include the TPR 242131584 number and this LI number in the case notes and attach following:

- Short test

- Sound / video file with the engine noise

- Sound / video file with the engine noise while the oil pressure switch (Y130) is disconnected

- Check for any debris in engine oil and attach illustration if any

- Provide information whether noise diminishes while engine runs at operating temperature

The case will be forwarded to engineering and the next steps determined at that time.

Symptoms
Power generation > Engine noise > Noise

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	3
Function group	03.10 - Connecting rods, pistons
Date	7/1/15
Validity	Engine 274.920 (LS)
Reason for change	Remedy updated

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration

Cause

Under analysis

Remedy

Please do not replace any components.

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration might be mistaken for an abnormal engine noise.

Compare the engine sound to the sound attached to this LI if it is similar. Disconnect the oil pressure switch (Y130) and compare the sound again if it is similar.

If the sounds are similar, the counter measure is in works and once officially available it will be published in the further version of this LI.

Check for debris in the engine oil. If none found, the vehicle can be driven at this point

Otherwise and in situation requiring MBUSA involvement (customer could be encouraged to contact CAC as well) connect with facing AOM and FTS and create a PTSS case. Include the TPR 242131584 number and this LI number in the case notes and attach following:

- Short test

- Sound / video file with the engine noise

- Sound / video file with the engine noise while the oil pressure switch (Y130) is disconnected

- Check for any debris in engine oil and attach illustration if any

- Provide information whether noise diminishes while engine runs at operating temperature

The case will be forwarded to engineering and the next steps determined at that time.

Attachments	
File	Description
M274 LS engine noise.MP3	Engine noise with Y130 connected

Symptoms
Power generation > Engine noise > Noise

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	4
Function group	03.10 - Connecting rods, pistons
Date	9/21/15
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Cause, Remedy and Validity updated

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration. The noise diminishes with the increased engine temperature and is not noticeable with engine at operating temperature.

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise.

Compare the engine sound to the sound attached to this LI if it is similar. If possible compare to other similar vehicles - preferably to vehicles after clean point. Perform other checks such as switching on and off consumers (A/C, lights, radio, etc.) or removing the drive belt to aid in noise analysis. In addition, observe any changes in noise levels with oil pressure switch disconnected (located on the front of the engine next to the harmonic balancer).

If it is determined that the complaint relates to that described in the "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table). The Lanchester balancer bolts will need to be replaced as well. Always refer to the EPC for latest parts specification.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please check parts availability before scheduling an appointment for repairs.

Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC.

Attachments

File	Description
M274 LS engine noise.MP3	Engine noise with Y130 connected
Kolben aus-, einbauen_M274_engl.pdf	WIS draft pistons r&r document

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove engine with transmission	
AR01.30-P-5800MRB	Remove the cylinder head	
AR03.20-P-1100MRA	Remove Lanchester balancer	
AR03.10-A-7021TPX	Pistins removal and installation	Draft only - not official WIS document. Refer to Attachments or Star TekInfo Temporary Postings

Symptoms

Power generation > Engine noise > Noise

Parts

Part number	ES1	ES2	Designation	Quantity	Note	EPC
A2740300900			Piston	4		X
A2700300120			Connecting rod	4		X
A2710380110			Bearing	8		X
A0029902403			Lanchester balancer bolt short	2		X
A0039900403			Lanchester balancer bolt long	2		X
A2740160020			Head gasket	1		X
A0000160569			Head bolt	10		X

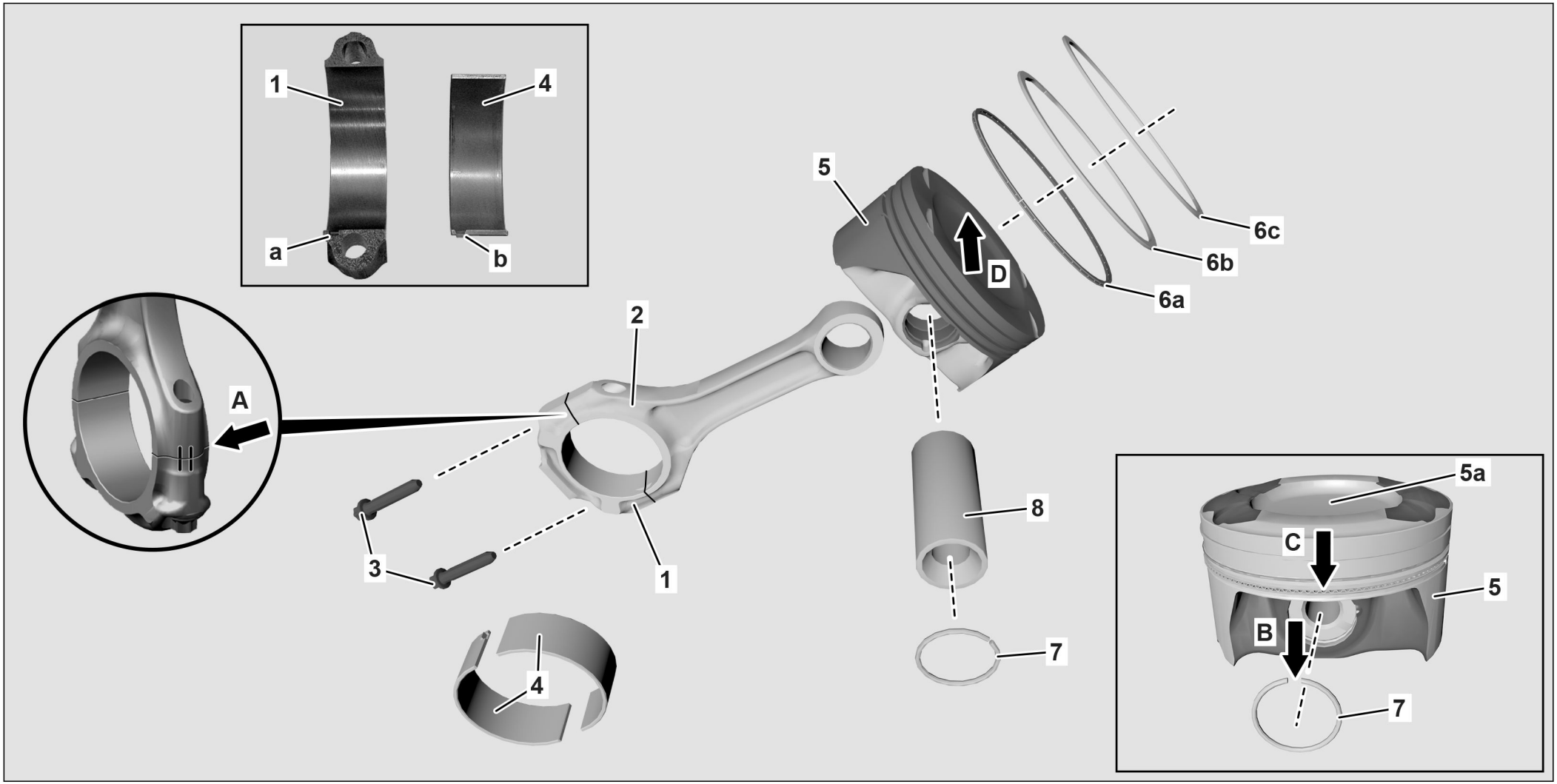
Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	A/C DRAIN FILL		0330417	
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAD R&R		0330417	
016821	EXTRA WORK FOR CYL HEAD W/ AU-TO TRANS		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	A/C DRYER		0330417	

540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

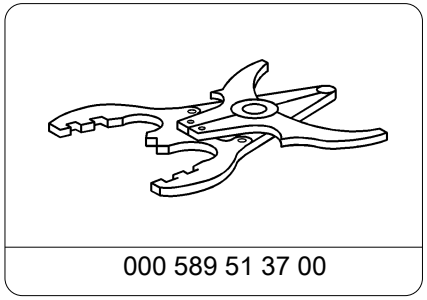
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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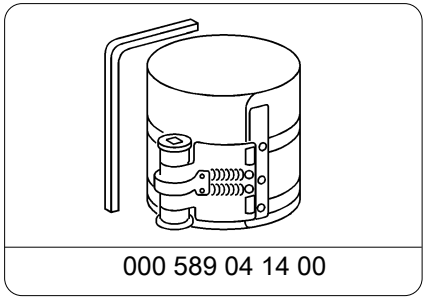
Zange



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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	5
Function group	03.10 - Connecting rods, pistons
Date	9/25/15
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Remove Op 01-682: removed from ASRA

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration. The noise diminishes with the increased engine temperature and is not noticeable with engine at operating temperature.

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise.

Compare the engine sound to the sound attached to this LI if it is similar. If possible compare to other similar vehicles - preferably to vehicles after clean point. Perform other checks such as switching on and off consumers (A/C, lights, radio, etc.) or removing the drive belt to aid in noise analysis. In addition, observe any changes in noise levels with oil pressure switch disconnected (located on the front of the engine next to the harmonic balancer).

If it is determined that the complaint relates to that described in the "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table). The Lanchester balancer bolts will need to be replaced as well. Always refer to the EPC for latest parts specification.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please check parts availability before scheduling an appointment for repairs.

Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC.

Attachments	
File	Description
M274 LS engine noise.MP3	Engine noise with Y130 connected
Kolben aus-, einbauen_M274_engl.pdf	WIS draft pistons r&r document

WIS-References		
Document number	Title	Note
AR01.10-P-2401MRA	Remove engine with transmission	
AR01.30-P-5800MRB	Remove the cylinder head	
AR03.20-P-1100MRA	Remove Lanchester balancer	
AR03.10-A-7021TPX	Pistins removal and installation	Draft only - not official WIS document. Refer to Attachments or Star TekInfo Temporary Postings

Symptoms
Power generation > Engine noise > Noise

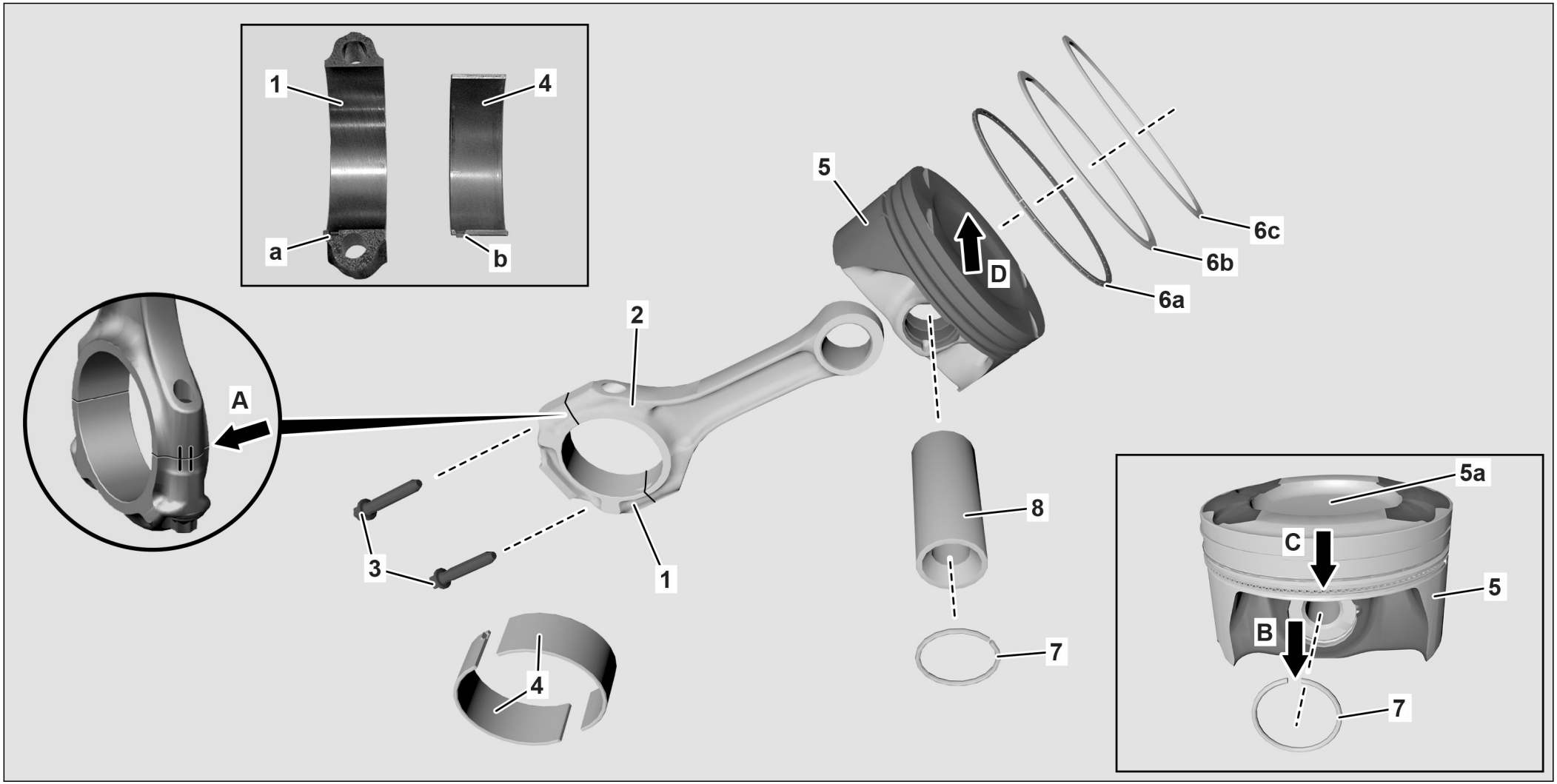
Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A2740300900			Piston	4		X
A2700300120			Connecting rod	4		X
A2710380110			Bearing	8		X
A0029902403			Lanchester balancer bolt short	2		X
A0039900403			Lanchester balancer bolt long	2		X
A2740160020			Head gasket	1		X
A0000160569			Head bolt	10		X

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	A/C DRAIN FILL		0330417	
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAD R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	A/C DRYER		0330417	
540650	12V		0330417	
541011	QUICK TEST		0330417	

406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

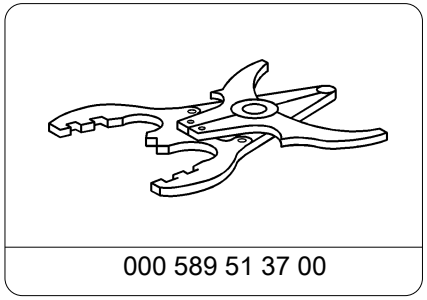
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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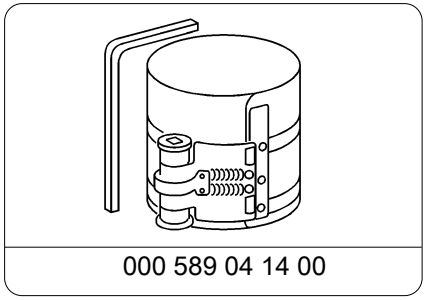
Zange



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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	6
Function group	03.10 - Connecting rods, pistons
Date	11/10/15
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	new op

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration. The noise diminishes with the increased engine temperature and is not noticeable with engine at operating temperature.

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise.

Compare the engine sound to the sound attached to this LI if it is similar. If possible compare to other similar vehicles - preferably to vehicles after clean point. Perform other checks such as switching on and off consumers (A/C, lights, radio, etc.) or removing the drive belt to aid in noise analysis. In addition, observe any changes in noise levels with oil pressure switch disconnected (located on the front of the engine next to the harmonic balancer).

If it is determined that the complaint relates to that described in the "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table). The Lanchester balancer bolts will need to be replaced as well. Always refer to the EPC for latest parts specification.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please check parts availability before scheduling an appointment for repairs.

Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC.

Attachments	
File	Description
M274 LS engine noise.MP3	Engine noise with Y130 connected
Kolben aus-, einbauen_M274_engl.pdf	WIS draft pistons r&r document

WIS-References		
Document number	Title	Note
AR01.10-P-2401MRA	Remove engine with transmission	
AR01.30-P-5800MRB	Remove the cylinder head	
AR03.20-P-1100MRA	Remove Lanchester balancer	
AR03.10-A-7021TPX	Pistins removal and installation	Draft only - not official WIS document. Refer to Attachments or Star TekInfo Temporary Postings

Symptoms
Power generation > Engine noise > Noise

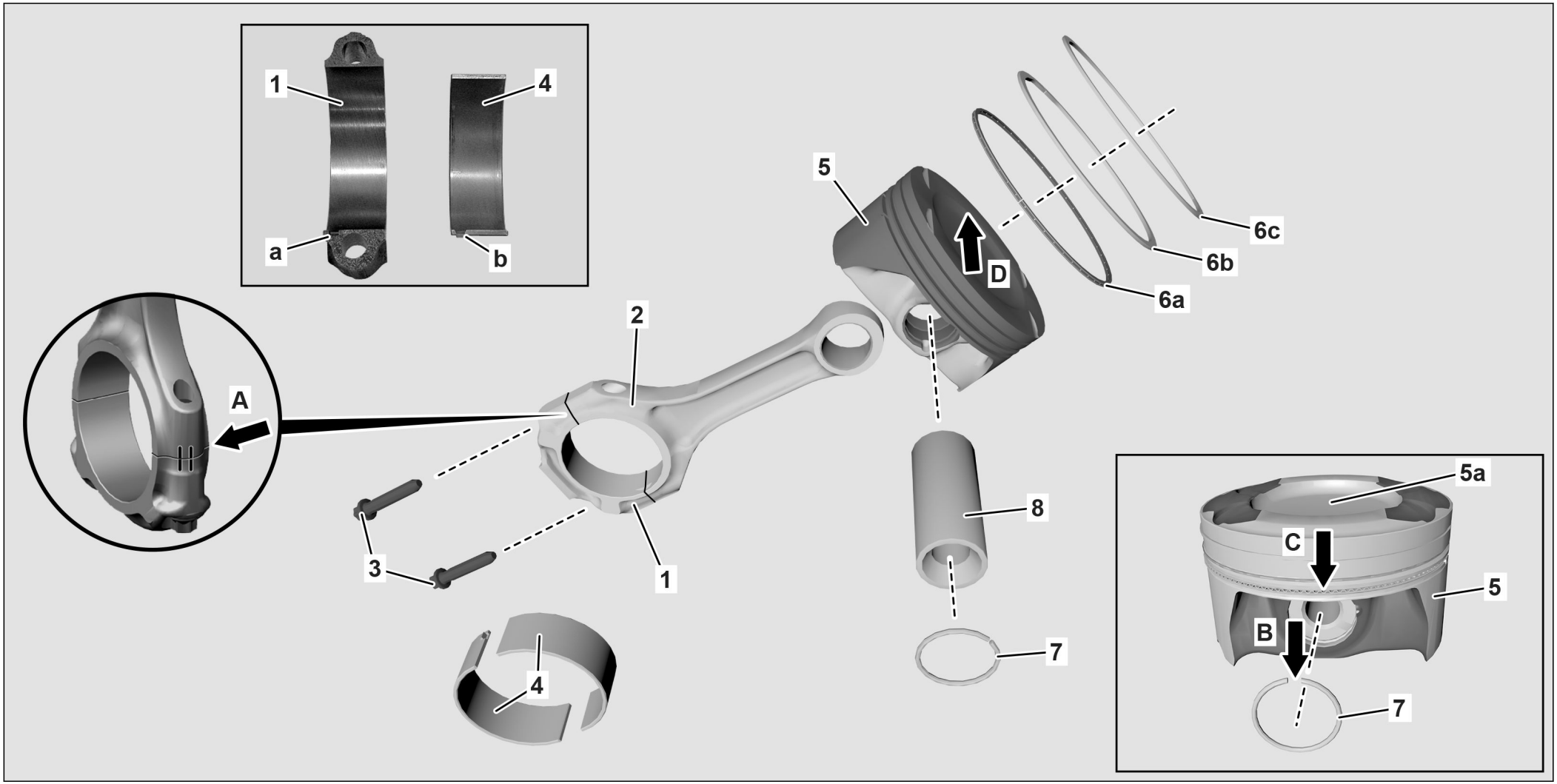
Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A2740300900			Piston	4		X
A2700300120			Connecting rod	4		X
A2710380110			Bearing	8		X
A0029902403			Lanchester balancer bolt short	2		X
A0039900403			Lanchester balancer bolt long	2		X
A2740160020			Head gasket	1		X
A0000160569			Head bolt	10		X

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	A/C DRAIN FILL		0330417	
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAD R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	A/C DRYER		0330417	
540650	12V		0330417	
541011	QUICK TEST		0330417	

406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

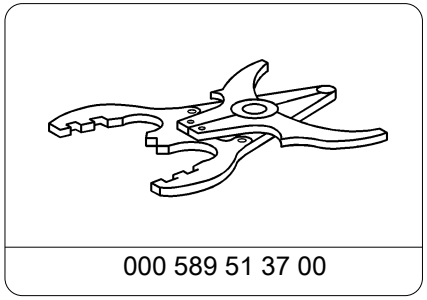
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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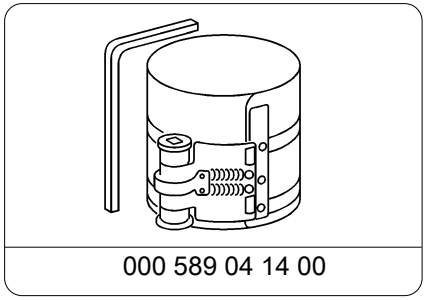
Zange



000 589 04 14 00

Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	7
Function group	03.10 - Connecting rods, pistons
Date	5/23/16
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	add ops

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration. The noise diminishes with the increased engine temperature and is not noticeable with engine at operating temperature.

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise.

Compare the engine sound to the sound attached to this LI if it is similar. If possible compare to other similar vehicles - preferably to vehicles after clean point. Perform other checks such as switching on and off consumers (A/C, lights, radio, etc.) or removing the drive belt to aid in noise analysis. In addition, observe any changes in noise levels with oil pressure switch disconnected (located on the front of the engine next to the harmonic balancer).

If it is determined that the complaint relates to that described in the "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table). The Lanchester balancer bolts will need to be replaced as well. Always refer to the EPC for latest parts specification.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please check parts availability before scheduling an appointment for repairs.

Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC.

Attachments	
File	Description
M274 LS engine noise.MP3	Engine noise with Y130 connected
Kolben aus-, einbauen_M274_engl.pdf	WIS draft pistons r&r document

WIS-References		
Document number	Title	Note
AR01.10-P-2401MRA	Remove engine with transmission	
AR01.30-P-5800MRB	Remove the cylinder head	
AR03.20-P-1100MRA	Remove Lanchester balancer	
AR03.10-A-7021TPX	Pistins removal and installation	Draft only - not official WIS document. Refer to Attachments or Star TekInfo Temporary Postings

Symptoms
Power generation > Engine noise > Noise

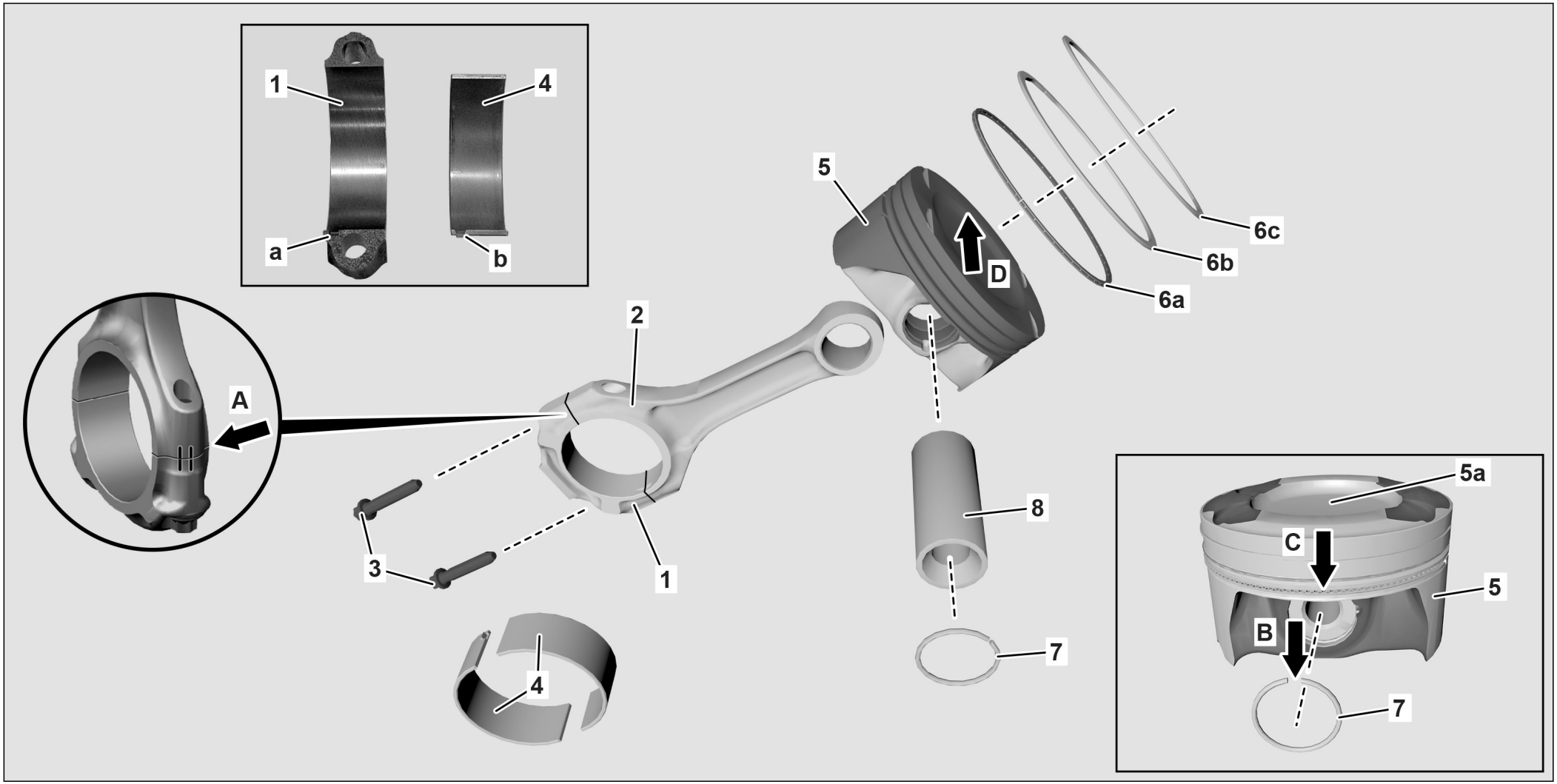
Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A2740300900			Piston	4		X
A2700300120			Connecting rod	4		X
A2710380110			Bearing	8		X
A0029902403			Lanchester balancer bolt short	2		X
A0039900403			Lanchester balancer bolt long	2		X
A2740160020			Head gasket	1		X
A0000160569			Head bolt	10		X

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	A/C DRAIN FILL		0330417	
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAD R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	A/C DRYER		0330417	
540650	12V		0330417	
541011	QUICK TEST		0330417	

406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

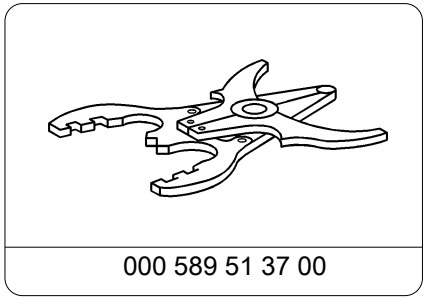
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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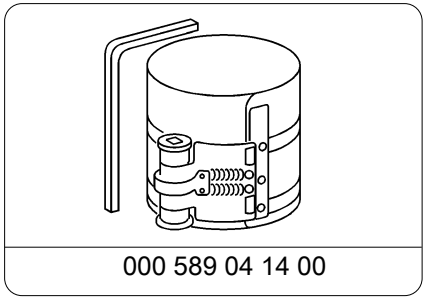
Zange



000 589 04 14 00

Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	8
Function group	03.10 - Connecting rods, pistons
Date	6/29/16
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	4matic only

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration. The noise diminishes with the increased engine temperature and is not noticeable with engine at operating temperature.

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Compare the engine sound with another vehicle - the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise.

Compare the engine sound to the sound attached to this LI if it is similar. If possible compare to other similar vehicles - preferably to vehicles after clean point. Perform other checks such as switching on and off consumers (A/C, lights, radio, etc.) or removing the drive belt to aid in noise analysis. In addition, observe any changes in noise levels with oil pressure switch disconnected (located on the front of the engine next to the harmonic balancer).

If it is determined that the complaint relates to that described in the "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table). The Lanchester balancer bolts will need to be replaced as well. Always refer to the EPC for latest parts specification.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please check parts availability before scheduling an appointment for repairs.

Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC.

Attachments	
File	Description
M274 LS engine noise.MP3	Engine noise with Y130 connected
Kolben aus-, einbauen_M274_engl.pdf	WIS draft pistons r&r document

WIS-References		
Document number	Title	Note
AR01.10-P-2401MRA	Remove engine with transmission	
AR01.30-P-5800MRB	Remove the cylinder head	
AR03.20-P-1100MRA	Remove Lanchester balancer	
AR03.10-A-7021TPX	Pistins removal and installation	Draft only - not official WIS document. Refer to Attachments or Star TekInfo Temporary Postings

Symptoms
Power generation > Engine noise > Noise

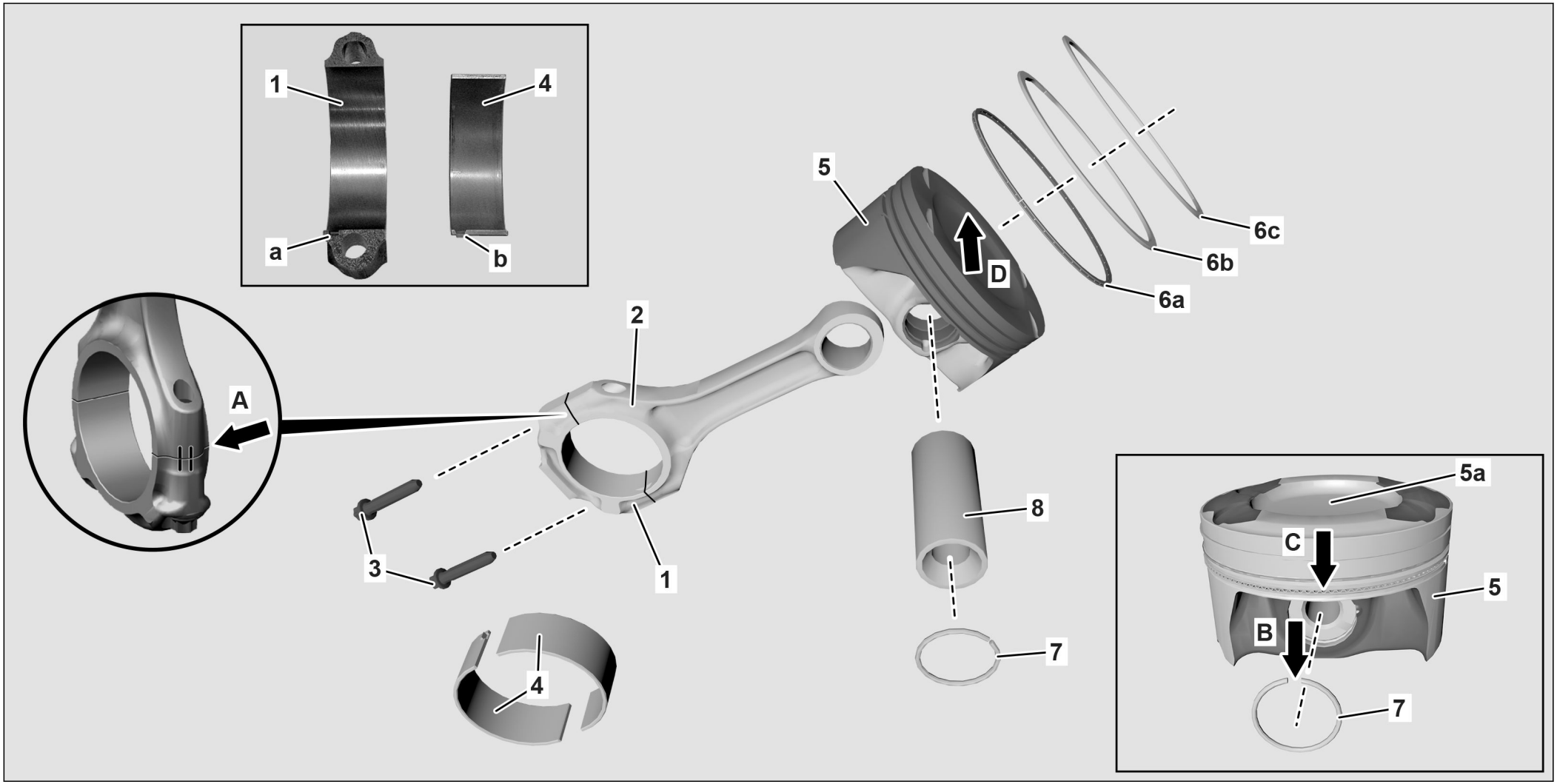
Parts						
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A2740300900			Piston	4		X
A2700300120			Connecting rod	4		X
A2710380110			Bearing	8		X
A0029902403			Lanchester balancer bolt short	2		X
A0039900403			Lanchester balancer bolt long	2		X
A2740160020			Head gasket	1		X
A0000160569			Head bolt	10		X

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY- A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAD R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	

541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

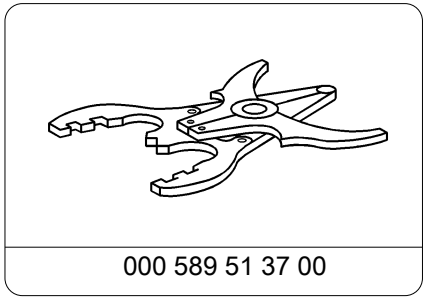
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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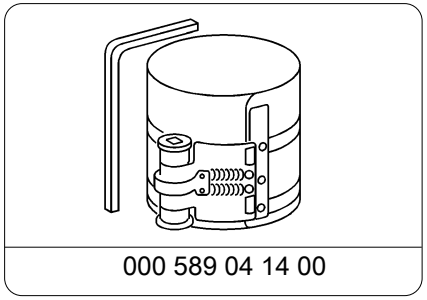
Zange



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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	9
Function group	03.10 - Connecting rods, pistons
Date	6/30/16
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Document revised

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since kit containing these parts is now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

Attachments

File	Description
Remove_install piston.pdf	Remove/install piston

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	

Symptoms

Power generation > Engine noise > Noise

Parts

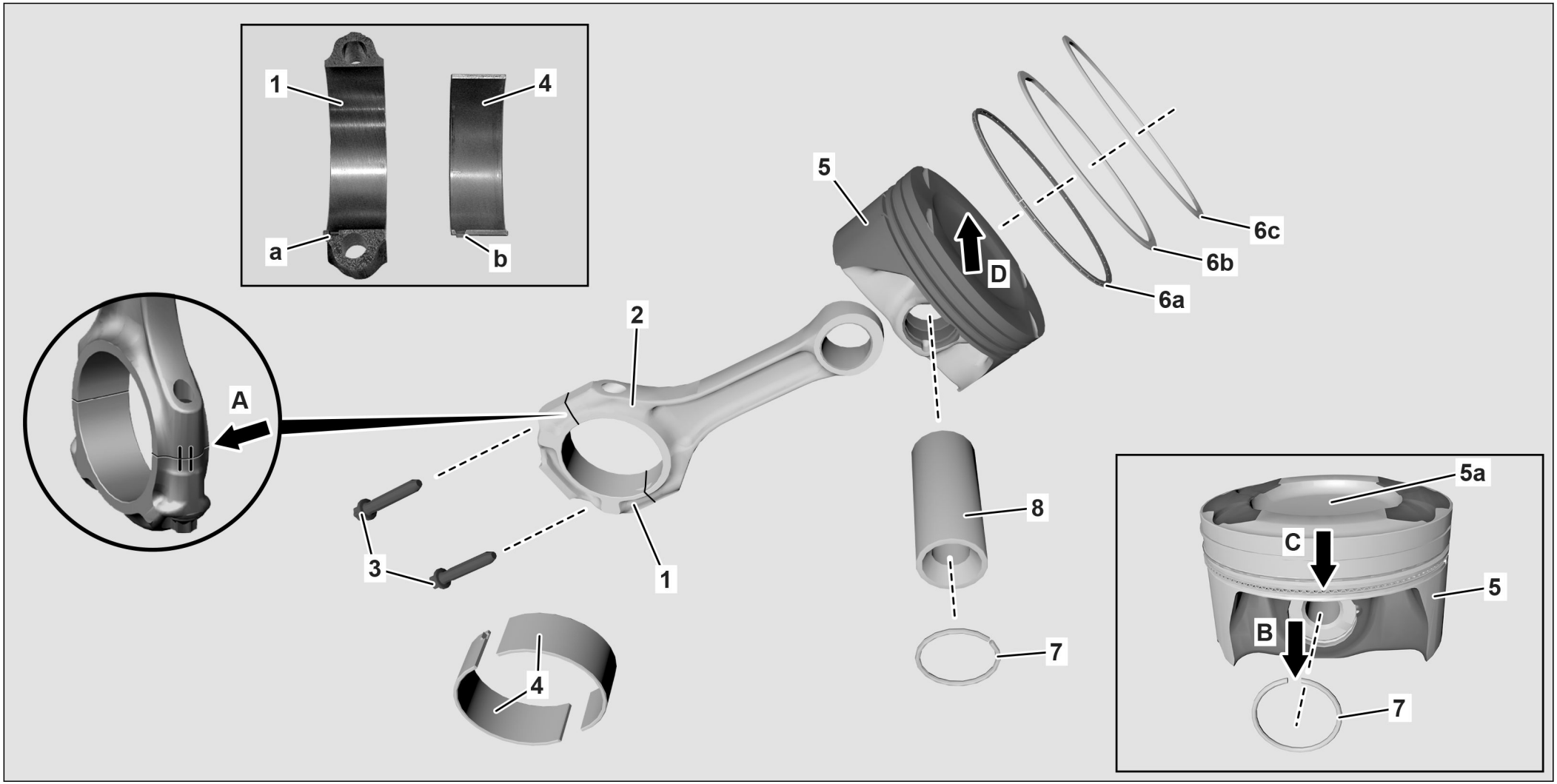
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

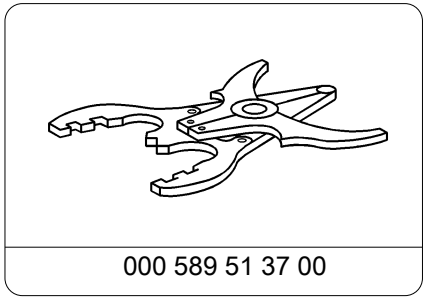
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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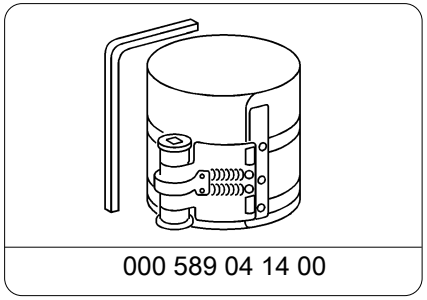
Zange



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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	10
Function group	03.10 - Connecting rods, pistons
Date	9/15/16
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	put ops back

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since kit containing these parts is now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

Attachments

File	Description
Remove_install piston.pdf	Remove/install piston

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	

Symptoms

Power generation > Engine noise > Noise

Parts

Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

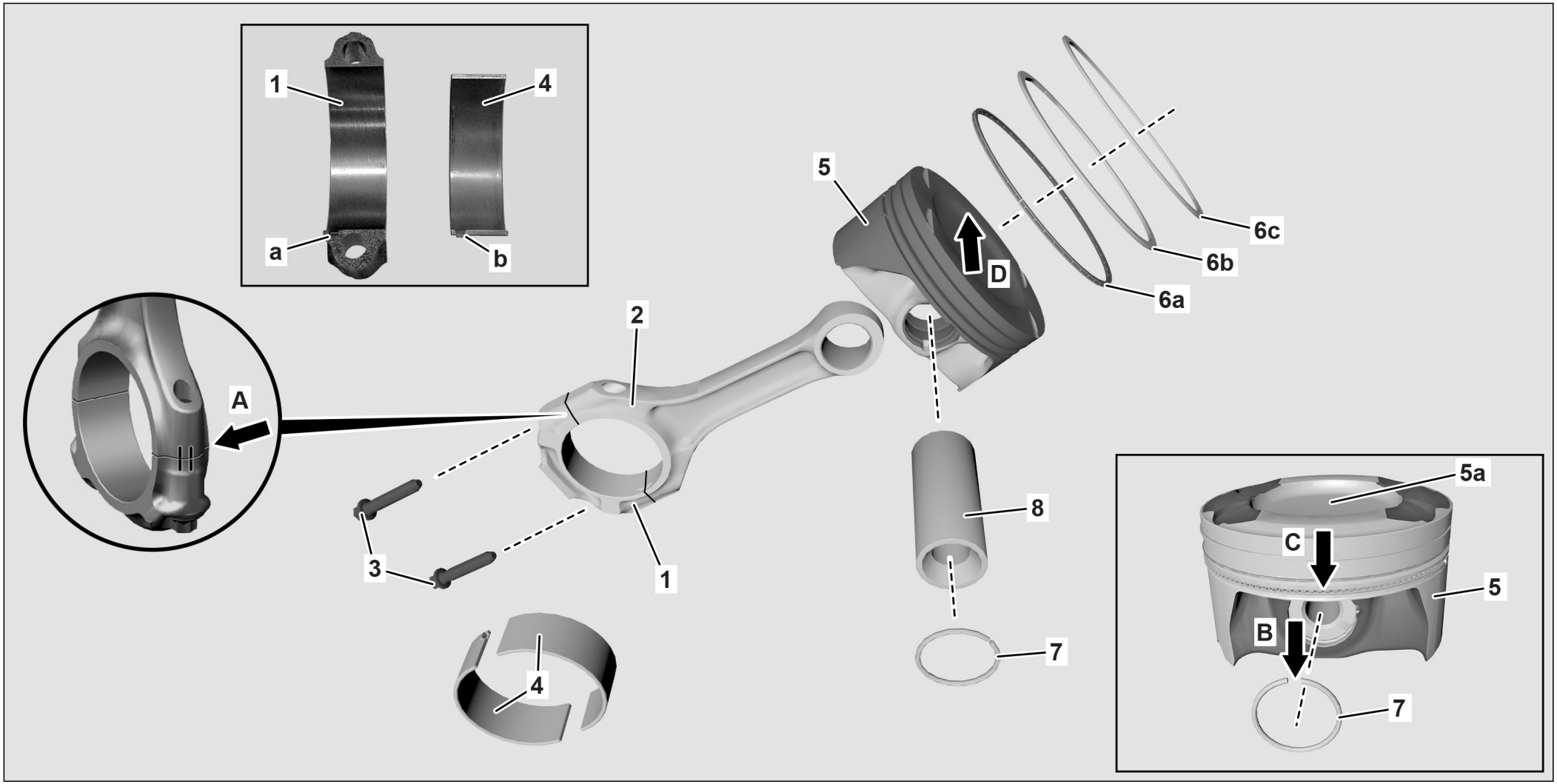
Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note

941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

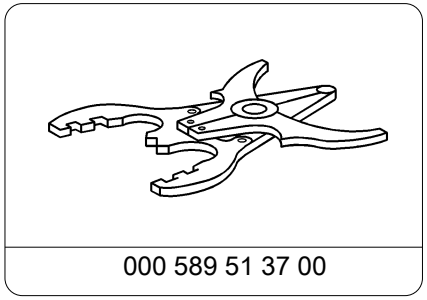
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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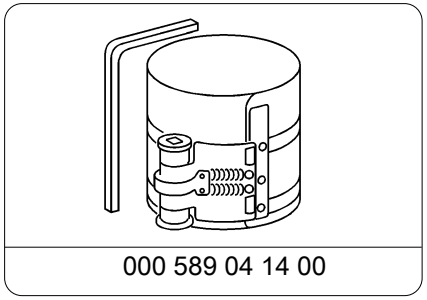

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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	11
Function group	03.10 - Connecting rods, pistons
Date	10/9/17
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	edit

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since kit containing these parts is now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

Attachments

File	Description
Remove_install piston.pdf	Remove/install piston

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	

Symptoms

Power generation > Engine noise > Noise

Parts

Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

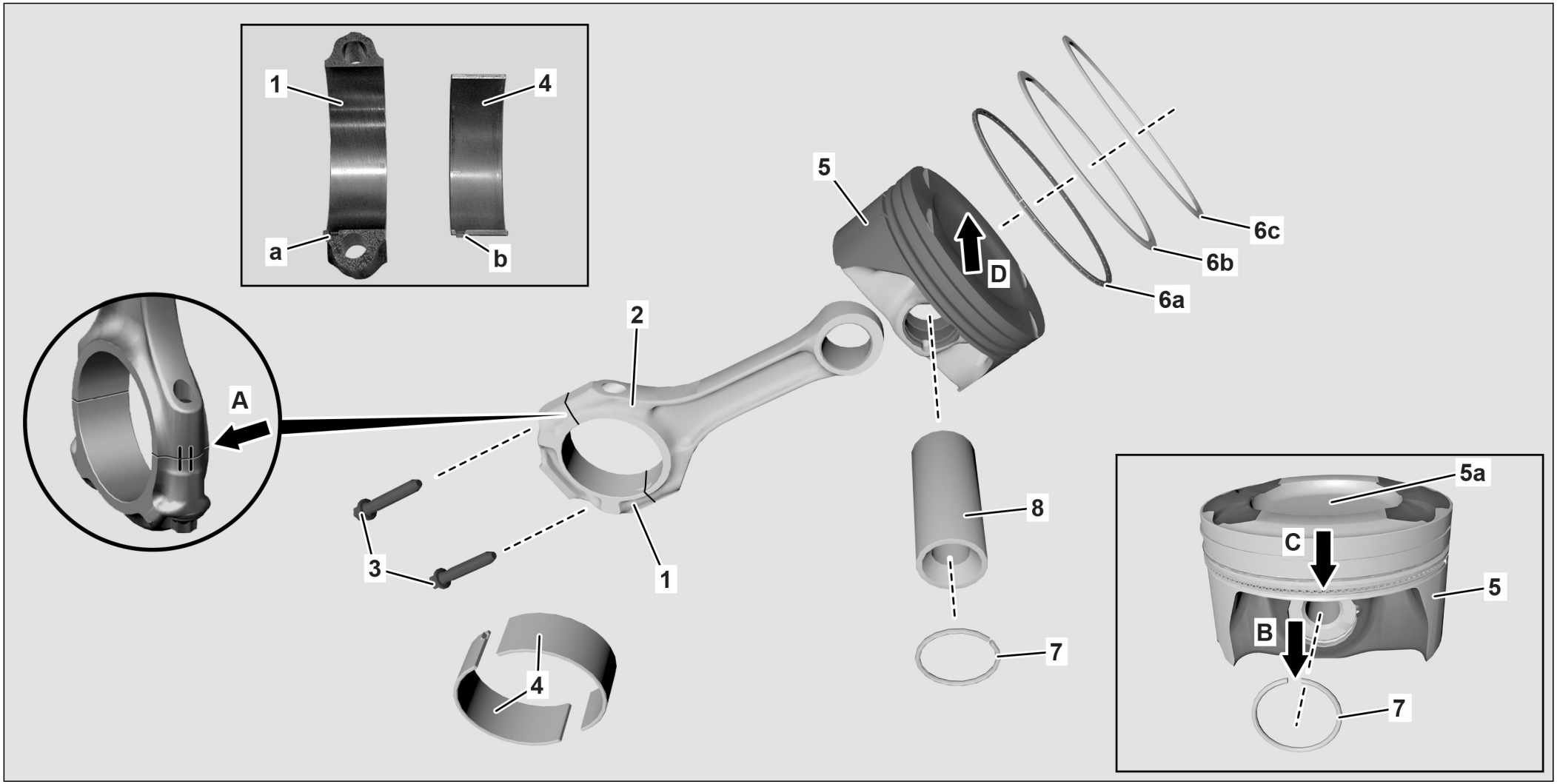
Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note

941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

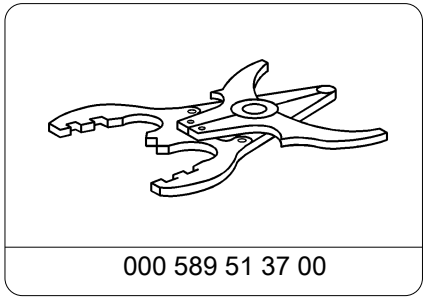
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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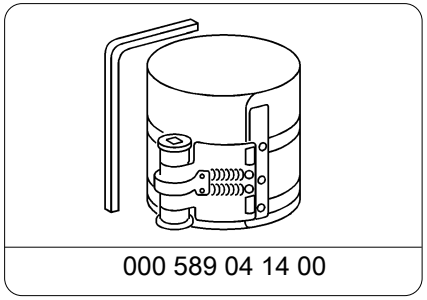
Zange



000 589 04 14 00

Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	12
Function group	03.10 - Connecting rods, pistons
Date	10/10/17
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Update reference documents.

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since the kit containing these parts are now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

Attachments

File	Description
Remove_install piston.pdf	Remove/install piston

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	
AR01.10-P-2500MRA	Remove/Install engine with front axle carrier	

Symptoms

Power generation > Engine noise > Noise

Parts

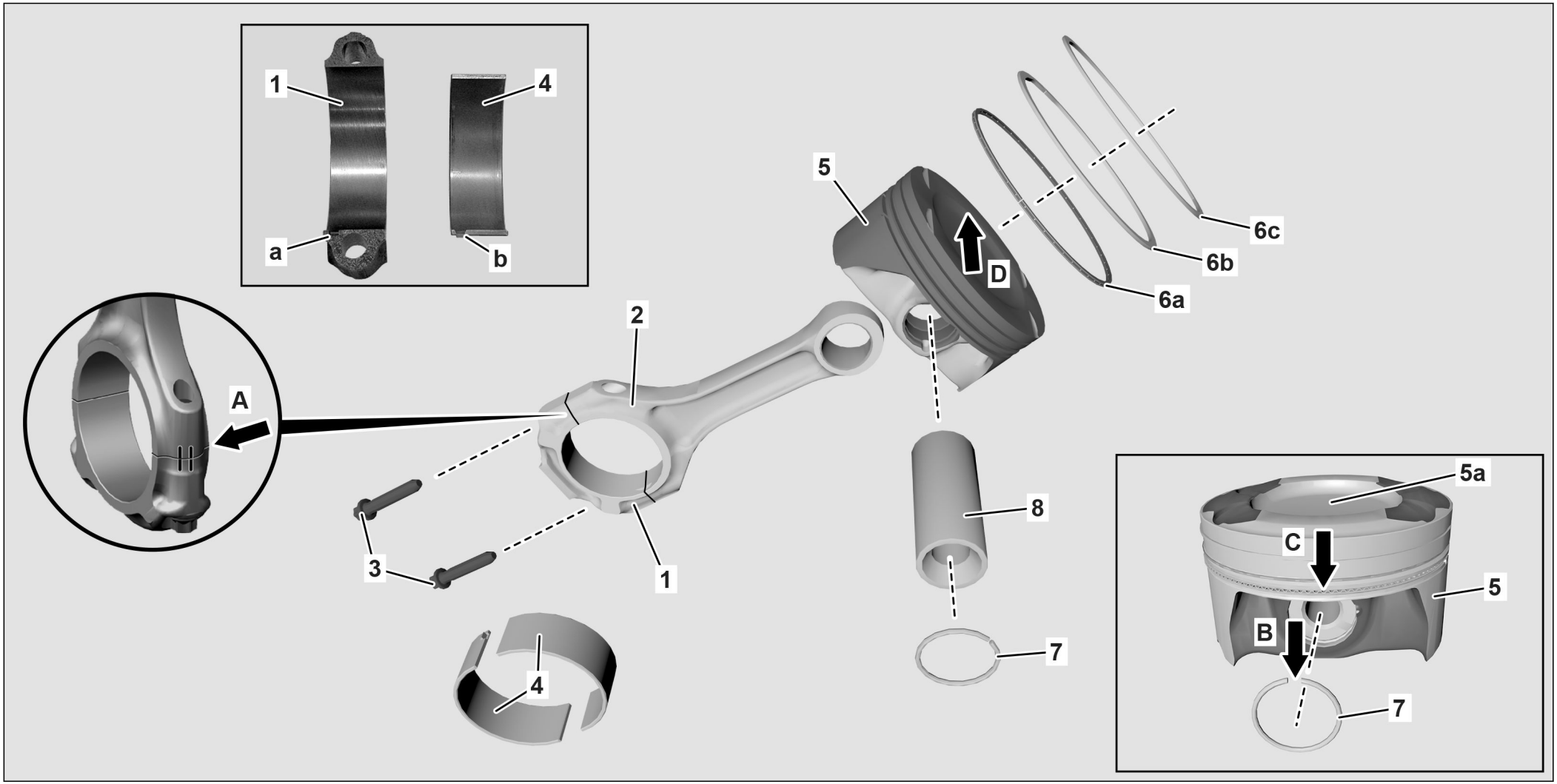
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

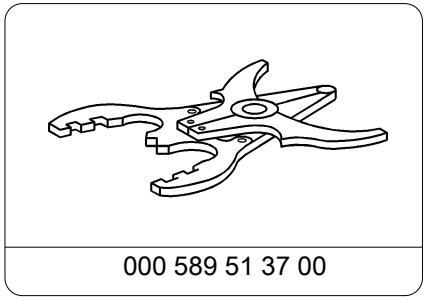
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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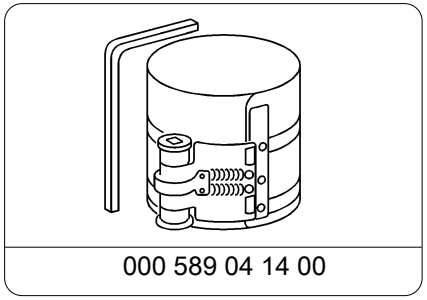

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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	13
Function group	03.10 - Connecting rods, pistons
Date	4/16/18
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Amended attachment references

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since the kit containing these parts are now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

Attachments

File	Description
Remove_install piston.pdf	Remove/install piston

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	
AR01.10-P-2500MRA	Remove/Install engine with front axle carrier	

Symptoms

Power generation > Engine noise > Noise

Parts

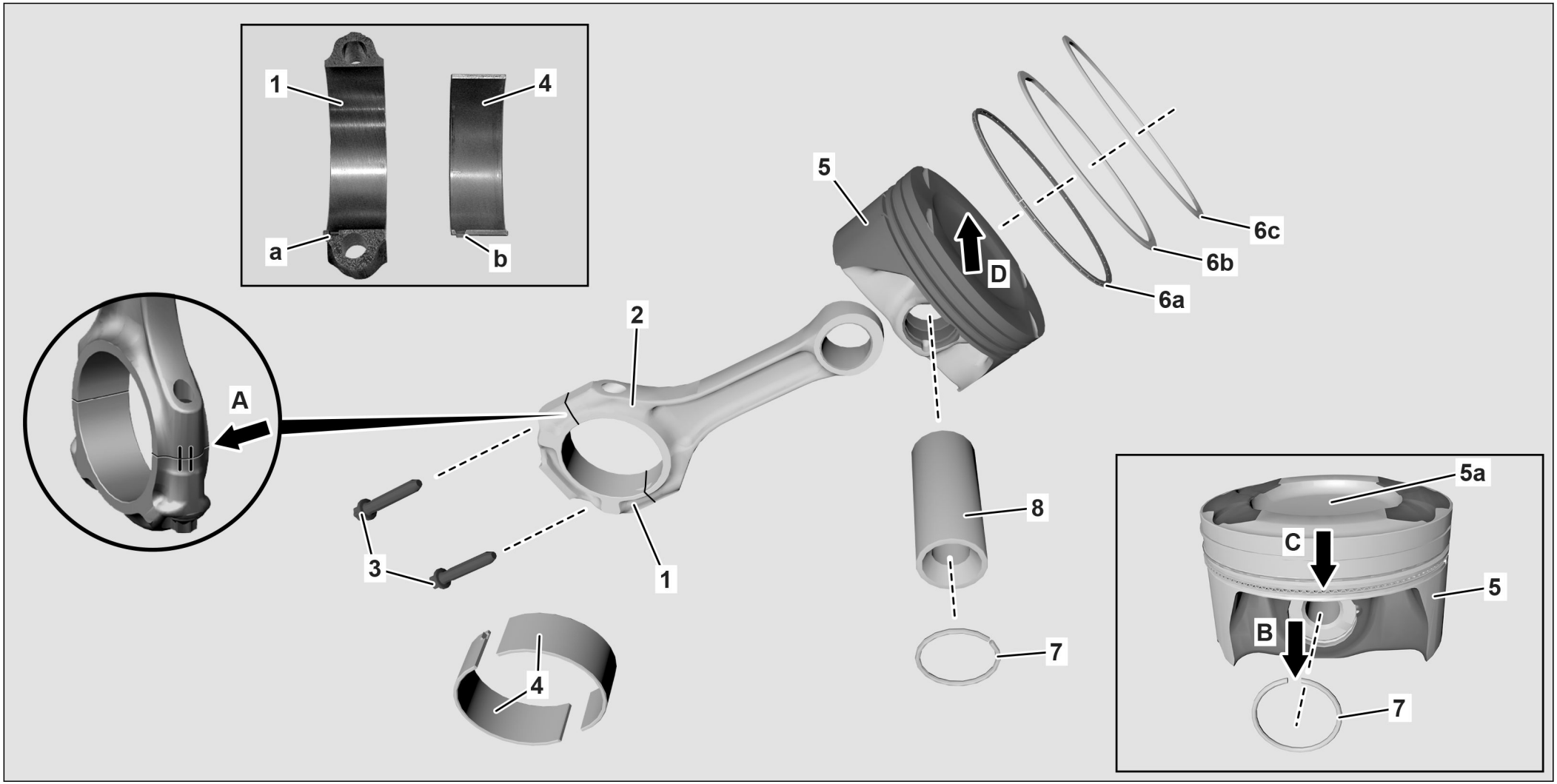
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission		AR01.10-P-2401MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand, use the following tools: Passenger car engine assembly stand gotis:// A_01_15.0		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

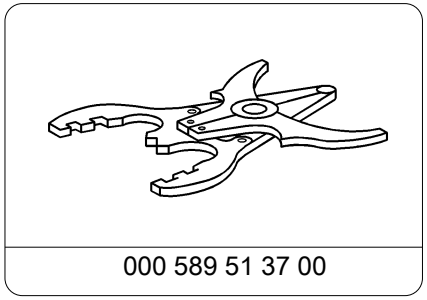
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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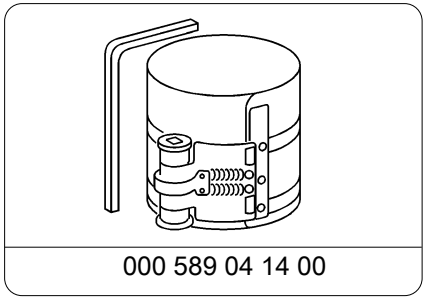
Zange



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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	14
Function group	03.10 - Connecting rods, pistons
Date	8/20/18
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	opcode

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since the kit containing these parts are now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to the attachment for a WIS draft document with instructions for pistons r&r - or go to temporary postings on STI. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

Attachments

File	Description
Remove_install piston.pdf	Remove/install piston

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	
AR01.10-P-2500MRA	Remove/Install engine with front axle carrier	

Symptoms

Power generation > Engine noise > Noise

Parts

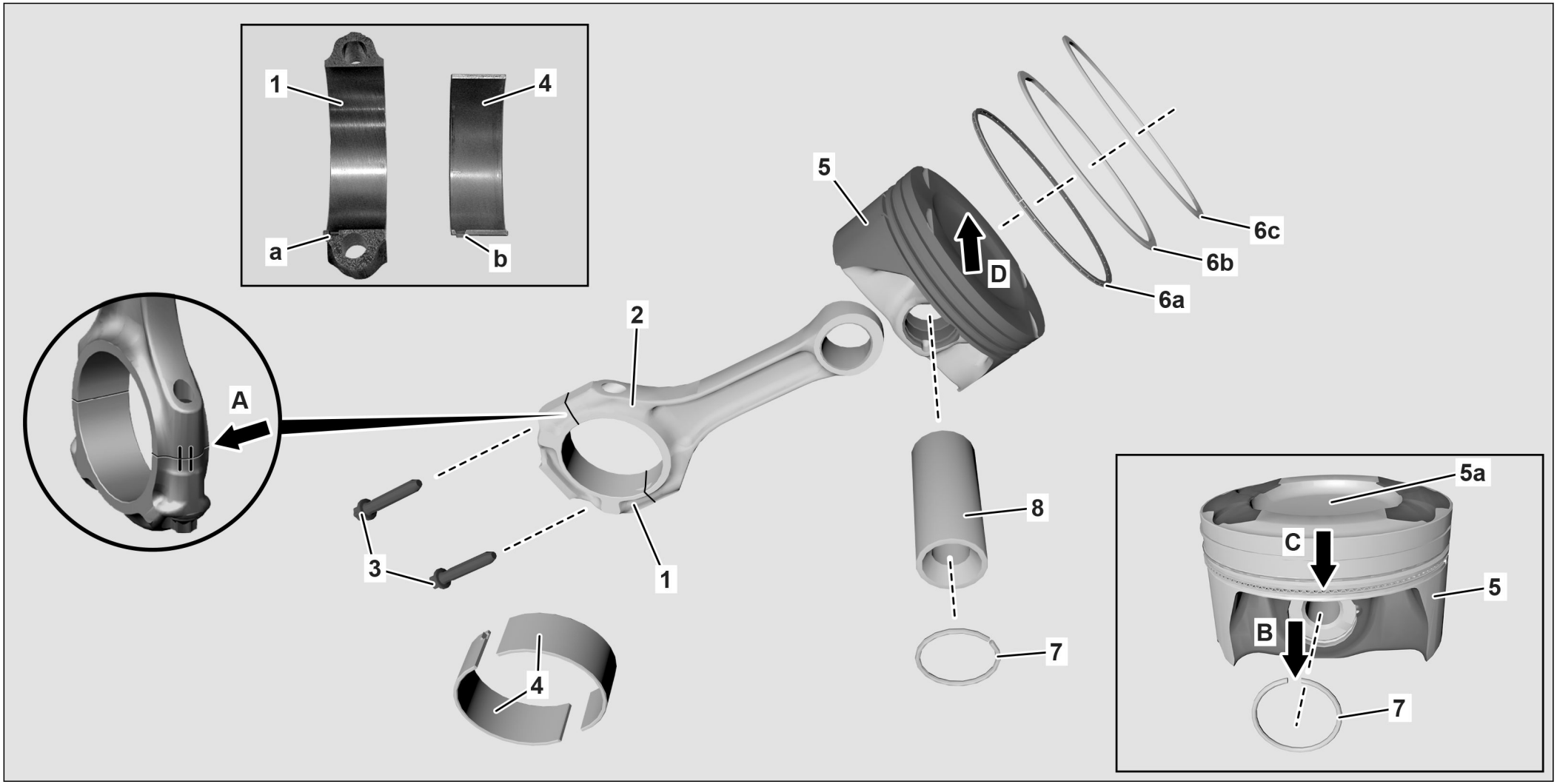
Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	
271256	CHECK/CORRECT TRANSMISSION FLUID		0330417	

AR03.10-A-7021TPX	Kolben aus-, einbauen	

MOTOR 274 im TYP 205



P03.10-2145-09

1 Connecting rod bearing cap
2 Connecting rod
3 Connecting rod bolt
4 Connecting rod bearing shell
5 Piston
5a Piston crown
6a Piston ring (oil scraper ring)
6b Piston ring (taper-faced hook scraper ring)
6c Piston ring (plain compression ring)
7 Retaining ring
8 Piston pin
a Groove
b Anti-twist lock

Piston with driving direction arrow

P03.10-2147-11

	Ausbauen		
1	Remove engine with transmission	non-4Matic vehicles (without option code M0005) 4Matic vehicles (with option code M0005)	AR01.10-P-2401MRA AR01.10-P-2500MRA
2	Detach transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
3	Mount engine on assembly stand		
4	Remove the cylinder head		AR01.30-P-5800MRB
5	Remove oil pan		AR01.45-P-7500MRA
6	Remove oil pump		AR18.10-P-6020MRA
7	Remove Lanchester balancer		AR03.20-P-1100MRA
8	Remove connecting rod bolts (3)		
9	Remove connecting rod bearing cap (1)		
10	Remove connecting rod bearing shells (4)		
11	Remove piston (5) with connecting rod (2) upwards out of the crankcase		
	Reinigen		
12	Clean all power unit components	The power unit components must be absolutely free of soiling/debris. Otherwise a engine damage can be the result. Montagereiniger	BR00.45-Z-1028-04A
	Prüfen		
13	Check all power unit components for damage and wear and replace if necessary		

14 i	Check cylinder barrel, please see "General information on inspecting cylinder walls" Allgemeine Hinweise zur Prüfung von Zylinderlaufflächen		AH01.00-P-0300-01A
	Einbauen		
15	Lubricate piston pin (8) and connecting rod small end		
16	Align piston (5) and connecting rod (2) to each other	i Note markings to restore the correct installation position.	
17	Press piston pin (8) by hand into piston (5)		
18	Insert retaining ring (7) of piston pin (8) into groove on piston (5)	i The opening of the retaining ring (7) must point vertically in the direction of the piston crown (5a) (arrows B and C) after assembly.	
19	Mount piston rings (6a, 6b, 6c)	Zange	AR03.10-P-7311FH 000 589 51 37 00
20	Lubricate cylinder bore, piston (5), connecting rod bearing shell (4) and connecting rod journal		
21	Tension piston rings (6a, 6b, 6c) onto the piston (5) using the tensioning strap	i The pistons (5) must be installed with piston ring end gaps installed offset by 120° degrees. Spannband	000 589 04 14 00

22	Install piston (5) in driving direction	Note: driving direction arrow or marking on piston (5). Rotate crankshaft so that connecting rod (2) is not touching connecting rod journal when inserting the piston (5) into cylinder bore.	
23	Install connecting rod bearing shells (4) and put on connecting rod bearing cap (1)	Ensure that the anti-twist lock (b) for the connecting rod bearing shell (4) lies on the respective inner edge of the groove (a). Otherwise the connecting rod bearing shells (4) doesn´t fit in center and a engine damage could be the result.	
24	Install connecting rod bolts (3) in position and tighten to the specified torque	Apply motor oil on thread and bolt head of connecting rod bolts (3). If no angle wrench is available, tighten connecting rod bolt (3) further with a socket wrench concurrently by the prescribed angle. To exclude angle error, no bending beam torque wrench should be used when tightening. Nm Pleuelschraube	BA03.10-P-1001-01E
25	Turn crankshaft by hand and check for unobstructed movement of crank assembly		

26	Install Lanchester balancer	Nm Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	BA03.20-P-1001-03B
27	Install oil pump	Nm Schraube Ölpumpe an Kurbelgehäuse Nm Schraube Ölsaugrohr an Rohrflansch/ Halter Nm Schraube Ölabweisblech an Kurbelgehäuse	AR18.10-P-6020MRA BA18.10-P-1001-01S BA18.10-P-1003-01S BA18.10-P-1005-01S
28	Install oil pan	Nm Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	AR01.45-P-7500MRA BA01.45-P-1001-01T
29	Install cylinder head		AR01.30-P-5800MRB
30	Detach engine from assembly stand		
31	Mount transmission with torque converter	TRANSMISSION 722.96 TRANSMISSION 722.9 (except 722.96)	AR27.10-P-0500LWY AR27.10-P-0500LWA
32	Install engine with transmission		AR01.10-P-2401MRA

Nm **Ölwanne**

Nummer	Benennung			MOTOR274
BA01.45-P-1001-01T	Schraube Ölwanne an Kurbelgehäuse/ Steuergehäusedeckel	M6	Nm	11

Nm Pleuel

Nummer	Benennung			MOTOR274
BA03.10-P-1001-01E	Pleuelschraube	1. Stufe	Nm	5
		2. Stufe	Nm	15
		3. Stufe	∠°	90

Nm Lanchester-Ausgleich

Nummer	Benennung			MOTOR 274
BA03.20-P-1001-03B	Schraube Lanchester-Ausgleichsgehäuse an Zylinderkurbelgehäuse	1. Stufe	Nm	5
		2. Stufe	Nm	27
		3. Stufe	∠°	90
		4. Stufe	∠°	90

Nm Ölpumpe

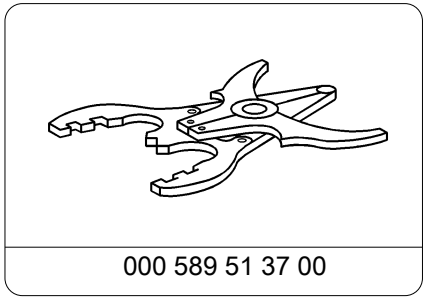
Nummer	Benennung		MOTOR 274
BA18.10-P-1001-01S	Schraube Ölpumpe an Kurbelgehäuse	Nm	14

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1003-01S	Schraube Ölsaugrohr an Rohrflansch/Halter	Nm	9

Nm Ölpumpe

Nummer	Benennung		MOTOR 274
BA18.10-P-1005-01S	Schraube Ölabweisblech an Kurbelgehäuse	Nm	9



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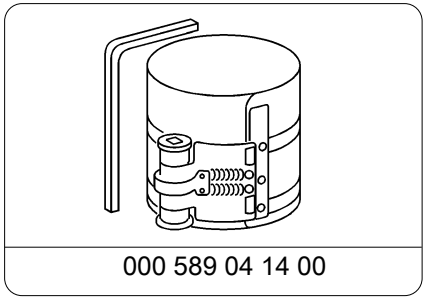
Zange



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Spannband

Reparaturmittel

Nummer	Bezeichnung	Bestellnummer
BR00.45-Z-1028-04A	Montagereiniger	Adolf Würth GmbH & Co. KG Reinhold-Würth-Str. 12-17 74653 Künzelsau-Gaisbach Deutschland Tel. +49 7940 15-0 Fax +49 7940 15-1000 www.wuerth.de

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	15
Function group	03.10 - Connecting rods, pistons
Date	10/15/18
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Removed reference to WIS draft document and added final published reference. Draft WIS document had incorrect torquing procedures for new connecting rod bolts.

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since the kit containing these parts are now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to WIS documentation for piston R&R. As of writing, the appropriate document is AR03.10-P-7021MR. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	
AR01.10-P-2500MRA	Remove/Install engine with front axle carrier	
AR03.10-P-7021MR	Remove/Install Piston	Please be sure to check torquing procedure differences for new versus used bolts on connecting rod.

Symptoms

Power generation > Engine noise > Noise

Parts

Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note
941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
037311	PISTON RINGS		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	
271256	CHECK/CORRECT TRANSMISSION FLUID		0330417	

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	16
Function group	03.10 - Connecting rods, pistons
Date	1/30/19
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	Opcode Remove 037311, add 038221

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since the kit containing these parts are now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to WIS documentation for piston R&R. As of writing, the appropriate document is AR03.10-P-7021MR. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	
AR01.10-P-2500MRA	Remove/Install engine with front axle carrier	
AR03.10-P-7021MR	Remove/Install Piston	Please be sure to check torquing procedure differences for new versus used bolts on connecting rod.

Symptoms

Power generation > Engine noise > Noise

Parts

Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note

941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
038221	FLEX PLATE		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611069	FRONT BELLY PANS		0330417	
611116	LEFT REAR UNDERPANEL		0330417	
611117	RIGHT REAR UNDERPANEL		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	
271256	CHECK/CORRECT TRANSMISSION FLUID		0330417	

Clattering/rattling engine noise on deceleration

Topic number	LI03.10-P-060916
Version	17
Function group	03.10 - Connecting rods, pistons
Date	1/30/19
Validity	Engine 274.920 (LS) Modified wrist pins are installed as of engines: 274 920 E0 043259 (as of about April 20, 2015) and 274 920 30 406602 (as of about March 27, 2015)
Reason for change	61-1028 for underpanels

Complaint

Clattering/rattling or knocking noise from the crank assembly of the engine when cold at oil temperatures up to approx. 50°C mostly heard on engine deceleration.

The noise diminishes with the increased engine temperature and is unnoticeable with engine at operating temperature.

Attachments	
File	Description
M274 LS engine noise.MP3	noise example

Cause

The knocking noise might be attributed to the unfavorable tolerance of the piston wrist pin resulting in enlarge end float of the connecting rod in the piston.

Remedy

Note:

The following tests must be performed with the engine cold (engine oil temperature must be lower than 50°C):

- Compare engine sound with another vehicle and to attached sound file (the normal sound related to the injectors shutting off during engine deceleration or other general sounds of operation of an direct injected engine might be mistaken for an abnormal engine noise).

- Perform other checks; switch on and off electrical consumers (A/C, lights, radio, etc.) and assess engine sound

- Observe any changes in noise levels with oil pressure switch disconnected and drive belt removed

- Increase the idle speed (constant rpm) and engine load and assess whether the noise changes

- Assess engine noise at engine oil temperature >80°C

If it is determined that the complaint relates to that described under "Cause", the repair would require replacement of all connecting rods, pistons and rod bearings (some needed replacement parts are listed in parts table).

Note:

It is no longer required ordering individual pistons, connecting rods and bearings since the kit containing these parts are now available (refer to parts information table).

The Lanchester balancer bolts must be replaced during repair.

Refer to the EPC for other parts needed in repairs outside of the piston kit.

Note:

Refer to WIS documentation for piston R&R. As of writing, the appropriate document is AR03.10-P-7021MR. Follow other WIS documents during repair (such as instructions for adjusting backlash play at Lanchester balancer).

Note:

Please ensure parts availability before scheduling an appointment for repairs. Follow parts return policy on replacement parts as the pistons and rods will be inspected at the QEC

WIS-References

Document number	Title	Note
AR01.10-P-2401MRA	Remove/install engine with transmission	
AR01.30-P-5800MRB	Remove/install cylinder head	
AR03.20-P-1100MRA	Remove/install Lanchester balancer	
AR01.10-P-2500MRA	Remove/Install engine with front axle carrier	
AR03.10-P-7021MR	Remove/Install Piston	Please be sure to check torquing procedure differences for new versus used bolts on connecting rod.

Symptoms

Power generation > Engine noise > Noise

Parts

Part number	ES1	ES2	Designation	Quantity	Note	EPC
A0029902403			Lanchester balancer bolt	2		X
A0039900403			Lanchester balancer bolt	2		X
A2740160020			Cylinder head gasket	1		X
A0000160569			Cylinder head bolts	10		X
A2740370300			Piston repair kit	1		X

Operation numbers/damage codes

Op. no.	Operation text	Time	Damage code	Note

941013	LOCATE NOISE		0330417	
547989	D/C GROUND LINE		0330417	
831762	4MATIC ONLY - A/C DRAIN FILL		0330417	4matic only. 205.048 A/C compressor stays connected, moved to side
012800	ENGINE REMOVE/INSTALL		0330417	
014270	ENGINE STAND		0330417	
015765	CYLINDER HEAR R&R		0330417	
037061	PISTONS R&R		0330417	
038221	FLEX PLATE		0330417	
836623	4MATIC ONLY A/C DRYER		0330417	4matic only. 205.048 A/C refridgerant lines not opened
540650	12V		0330417	
541011	QUICK TEST		0330417	
406500	4MATIC ONLY ALIGNMENT		0330417	May claim necessary adjustments. See ASRA
272110	DEFLANGE TRANS		0330417	
611028	ALL UNDERPANELS		0330417	
013032	4MATIC ONLY. ENGINE ON/OFF SUBFRAME		0330417	
271256	CHECK/CORRECT TRANSMISSION FLUID		0330417	