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<b>Service Technician Instruction</b>	<b>ST-135</b>	15 November 2017

Engine type                **J612...J620-E/F/J & J624-G/H/K**

Subject                    **Steel pistons, cylinder liners, scraper rings, cylinder head gaskets**  
**Permissible combinations**

The Service Technician Instruction ST-135 describes which steel pistons, cylinder liners, scraper rings and cylinder head gaskets can be combined with each other.

#### AFFECTED ENGINES / SCOPE OF THIS BULLETIN

Type 6 engines fitted with steel pistons, namely:

- J612...J620, Versions E (only those with steel pistons), F and J
- J624, Versions G, H and K

#### DESCRIPTION OF THE CONTENT

In October 2014 a revised power unit has been released for Type 6 steel-piston engines. The new power unit compromises of a new optimized steel piston and ring pack.

The revised power unit has an optimized blow-by and oil consumption at all load ranges. This design **must** be used in combination with the scraper ring released in September 2013. All hardware is 1:1 replaceable. If a single power unit is to be replaced, it is not necessary that all cylinders are upgraded to the new design.

Since September 2013, new Type 6 **steel-piston engines** (J612...J620-F/J and J624-G/H/K) have been fitted **WITH SCRAPER RINGS**.

The previously-used **cylinder liners WITHOUT scraper ring** are **no longer available for steel-piston engines**. This rule also applies to spare parts, i.e. if replacement is necessary on an older steel-piston engine, a cylinder liner **WITHOUT** a scraper ring can now only be replaced by a cylinder liner **WITH** a scraper ring. It is essential to ensure that the appropriate cylinder head gasket is used when making such a replacement!

**This bulletin explains which steel pistons, cylinder liners, scraper rings and cylinder head gaskets can be combined with each other.**

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## Steel piston assemblies in use

On Type 6 engines (J612...J620 and J624), the following steel piston assemblies (consisting of the piston, piston rings, piston pin and circlips) have been approved and fitted in the field:

Steel Piston Comparison – Piston Assemblies						
Version	Old (Steel)		New (Steel)		All	
Epsilon	Piston A Bank	Piston B Bank	Piston A Bank	Piston B Bank	Liner Assembly	Head Gasket
12,5	1212298	1212302	1226261	1226262	9011501	337295
	646682	646681				(557379 + 9007896 have substituted to 337295 in October 2017)
12,0	559737	559738	1226257	1226258	9011667	
11,5	610102	610103	1226249	1226250	9011591	
10,5	651963	651964	1226253	1226254	9011596	

Table 01: Steel piston assemblies in use (consisting of the piston, piston rings, piston pin and circlips)

Steel Piston Comparison – Pistons ONLY				
Version	Old (Steel)		New (Steel)	
Epsilon	Piston A Bank	Piston B Bank	Piston A Bank	Piston B Bank
12,5	1207205	1207206	1224419	1224422
	593320	593321		
12,0	558406	558407	1225841	1225842
11,5	593318	593319	1225839	1225840
10,5	610058	610059	1225837	1225838

Table 02: Steel pistons in use (part number stamped into the piston skirt)

## Service & Repair

For service & repair initially a re-worked version of the old piston is available. These parts must be used up for service and repair jobs ONLY. They should not be used for new assembly units. Once the re-worked parts have been used then service & repair should continue to use the NEW pistons.

Steel Piston Comparison – Pistons ONLY – SERVICE & REPAIR ONLY				
Version	Old (Steel)		New (Steel)	
Epsilon	Piston A Bank	Piston B Bank	Piston A Bank	Piston B Bank
12,5	1207205	1207206	1225029	1225030
	593320	593321		
12,0	558406	558407	1229586	1229588
11,5	593318	593319	1229590	1229591
10,5	610058	610059	1229592	1229593

Table 03: Steel pistons in use for SERVICE & REPAIR ONLY

## Piston rings in use

The same three piston rings are used on all the pistons listed in the Tables 01-03, regardless of the compression ratio (ε), the cylinder bank (A or B) and the engine type (J612...J620, J624). Table 04 also includes the ring pack used for the previous revision steel piston.

Steel Piston Comparison – Rings ONLY (All Epsilons)				
Description	Position	Old	New	Remark
Top Compression	Top Ring Groove	525639	1229689	Smaller end gap and side face chrome; 1227341 (used for a few engines only) has substituted to 1229689 in January 2015
Second Compression	Second Ring Groove	361319	361319	No change
Oil Ring	Third Ring Groove	363977	363977	1220501 (used for a few engines only) has substituted to 1224455 in January 2015; 1224455 was used from January 2015 to April 2017 and has substituted to 363977 again in order to avoid too low lube oil consumption

Table 04: Piston rings in use



### Permissible combinations of steel pistons, cylinder liners, scraper rings and cylinder head gaskets

Depending on the steel piston assembly used and its associated compression ratio  $\epsilon$ , the following combinations of steel pistons, cylinder liners, scraper rings and cylinder head gaskets are possible:

J612...J620 & J624		Piston Assembly		Cylinder Liner Assembly		Cylinder Head Gasket
STD/U1/U2 <sup>1)</sup>	Compression	A Bank	B Bank	Cylinder Liner	Scraper Ring	
STD <sup>1)</sup>	$\epsilon$ 12.5	1226261	1226262	9011502	9011503	<b>337295</b>  (557379 + 9007896 have substituted to 337295 in October 2017)
	$\epsilon$ 12.0	1226257	1226258	9011668	9011669	
	$\epsilon$ 11.5	1226249	1226250	9011592	9011593	
	$\epsilon$ 10.5	1226253	1226254	9011597	9011598	
U1 <sup>1)</sup>	$\epsilon$ 12.5	1226261	1226262	9012693	9011503	
	$\epsilon$ 12.0	1226257	1226258	9012692	9011669	
	$\epsilon$ 11.5	1226249	1226250	9012702	9011593	
	$\epsilon$ 10.5	1226253	1226254	9012701	9011598	
U2 <sup>1)</sup>	$\epsilon$ 12.5	1226261	1226262	9012697	9011503	
	$\epsilon$ 12.0	1226257	1226258	9012696	9011669	
	$\epsilon$ 11.5	1226249	1226250	9012706	9011593	
	$\epsilon$ 10.5	1226253	1226254	9012705	9011598	

**Table 05:** Permissible combinations of steel pistons, cylinder liners, scraper rings and cylinder head gaskets

### Previous usual combinations of steel pistons, cylinder liners WITH scraper ring and cylinder head gaskets

For the sake of completeness, the following Table also lists previous usual combinations of parts:

J612...J620 & J624		Piston Assembly		Cylinder Liner Assembly		Cylinder Head Gasket
STD/U1/U2 <sup>1)</sup>	Compression	A Bank	B Bank	Cylinder Liner	Scraper Ring	
STD <sup>1)</sup>	12,5	1212298	1212302	9011502	9011503	337295  (557379 + 9007896 have substituted to 337295 in October 2017)
		646682	646681			
	12,0	559737	559738	9011668	9011669	
	11,5	610102	610103	9011592	9011593	
	10,5	651963	651964	9011597	9011598	
U1 <sup>1)</sup>	12,5	1212298	1212302	9012693	9011503	
		646682	646681			
	12,0	559737	559738	9012692	9011669	
	11,5	610102	610103	9012702	9011593	
	10,5	651963	651964	9012701	9011598	
U2 <sup>1)</sup>	12,5	1212298	1212302	9012697	9011503	
		646682	646681			
	12,0	559737	559738	9012696	9011669	
	11,5	610102	610103	9012706	9011593	
	10,5	651963	651964	9012705	9011598	

**Table 06:** Previous usual combinations of steel pistons, cylinder liners WITH scraper ring and cylinder head gaskets

### Previous usual combinations of steel pistons, cylinder liners WITHOUT scraper ring and cylinder head gaskets

For the sake of completeness, the following Table also lists previous usual combinations of parts:

J612...J620 & J624		Piston Assembly		Cylinder Liner Assembly		Cylinder Head Gasket
STD/U1/U2 <sup>1)</sup>	Compression	A Bank	B Bank	Cylinder Liner	Scraper Ring	
STD <sup>1)</sup>	12,5	646682	646681	547658 <sup>2)</sup>	---	<b>385965</b>  (481207 + 557321 + 9003569 have substituted to 385965 in October 2017)
	12,0	559737	559738	547658 <sup>2)</sup>		
	11,5	610102	610103	547658 <sup>2)</sup>		
	10,5	651963	651964	577517 <sup>3)</sup>		
				547658 <sup>2)</sup>		

**Table 07:** Previous usual combinations of steel pistons, cylinder liners WITHOUT scraper ring and cylinder head gaskets

<sup>1)</sup> CYLINDER LINER SEAT VERSION IN CRANKCASE

As the seat for the cylinder liner, in other words the bore to accommodate the cylinder liner in the crankcase, can be re-machined twice (in accordance with the dimensions as specified by us), cylinder liners are available in the versions STD (standard), U1 (Übermaß 1 = oversized 1) and U2 (Übermaß 2 = oversized 2).

<sup>2)</sup> For Types J612...J620 engines

<sup>3)</sup> For Type J624 engines



### IMPORTANT NOTICE

- An incorrect combination of parts can result in damage to the engine (e.g. due to the piston colliding with the scraper ring).
- Any replacement of parts must be carried out in accordance with our Technical Instructions TA 1400-0170 and TA 1400 -0171, using the tools and equipment listed there (scraper ring removal tool, piston insertion sleeve,...).
- A NEW cylinder liner should only ever be fitted together with NEW piston rings, a NEW cylinder head gasket and NEW seals (O-rings) on the cylinder unit in question. For pistons, a thorough cleaning (especially of the ring grooves) will suffice provided that the piston does not need to be replaced due to damage or any other reason (e.g. maintenance schedule).
- If an oil ring is removed from the piston during any inspection or maintenance activity, then it must be replaced by a NEW oil ring as listed in Table 04.
- All components can be identified from the component marking, or should this not be discernible, from the definitions specified in TA 1400-0171.
- We recommend using the same combination of components on all the cylinders of an engine. Differing combinations are only possible if the following conditions are observed:
  - ✓ All the cylinder units have the same compression ratio  $\epsilon$ .
  - ✓ One of the component combinations listed in Table 05, 06 or 07 is installed in each cylinder unit.
- Any change in a component combination resulting in the installed component combination on one, several or all cylinders differing from the information in the engine parts list must be documented:
  - ✓ Entry in the engine log and correction to the on-site engine parts list  
If any component combination given in the engine parts list is changed on one, several or all cylinders, this must be noted in the engine log stating the data listed below, and the on-site engine parts list corrected accordingly.
  - ✓ Correcting the engine parts list in Oracle  
If the component combination stated in the engine parts list is changed on all cylinders, a correction to the engine parts list in Oracle by Jenbacher headquarters must be initiated in addition to the work steps described above. The following data will be needed for this as well.

### REQUIRED DATA

- Name and J-number of the site
- Engine number
- Number of operating hours and engine starts
- Date and time of the replacement of the parts
- Name and company (Jenbacher, Subsidiaries, Service Providers) of the technician carrying out the work
- Reason for replacing the parts
- Cylinder position(s)
- Information on the installed parts
  - Steel piston part number(s)
  - Piston ring part numbers
  - Cylinder liner part number(s)
  - Scraper ring part number
  - Cylinder head gasket part number(s)
  - Designation and part number(s) of any replaced parts in addition



## RELEVANT DOCUMENTS

When working on GE Jenbacher modules, all applicable local regulations must of course be observed in addition to our documentation. In relation to this Service Technician Instruction we stress the fact that the following documents must also be observed:

- Technical Instruction TA 1100-0111: General conditions – Operation and maintenance
- Technical Instruction TA 1400-0170: Pistons, connecting rods, cylinder liners - Removal on Type J624 engines
- Technical Instruction TA 1400-0171: Removal and fitting instructions for steel pistons, cylinder liners with scraper rings in J612, J616 and J620 engines

## REVISION CODE

INDEX	DATE	DESCRIPTION / REVISION SUMMARY
05	Nov. 15, 2017	Part numbers of the cylinder head gaskets updated
04	Apr. 26, 2017	Engine versions J/K added and part numbers of the oil ring updated
03	Jan. 13, 2017	Part number of the oil ring corrected and layout of the document (GE logo, header,...) updated
02	Jan. 19, 2015	Fundamental revision of the document after launching a new piston
01	Feb. 03, 2014	First version of this document

Table 08: Revision history