



TA 1400-0100

Technical Instruction

Running-in procedure for INNIO Jenbacher engines



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1 Scope

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

- Type 2
- Type 3
- Type 4
- Type 6
- Type 9

with a coupled generator (50 Hz and 60 Hz rated frequency).

2 Purpose

This Technical Instruction (TA) describes the running-in procedure for Jenbacher Engines.

3 Additional information

Perform the running-in procedure at the appropriate rated engine speed (apart from Type 9 engines).

The purpose of carrying out the running-in programme according to the instructions is:

- to be able to observe the engine operating behaviour closely after repair or maintenance to ensure that the work has been carried out correctly and to minimise any risk to subsequent normal operation.
- to achieve the required running-in wear of new engine components (cylinder linings, pistons, piston rings, plain bearings, etc.) in a controlled manner.

All new and repaired modules leaving the production plant (location Jenbach) are subjected to a mandatory running-in procedure on the factory test stand and to a functional test so that no running-in need be carried out on site.

New engines which are completed with the module frame at the installation site must be run in and tested on site, including J420B611 and J420C611 long blocks.

Modules which are repaired on site must be run in and tested on site. This includes all standard or emergency short blocks. These are not tested on the factory test stand.

Also perform the running-in procedure when replacing parts such as cylinder liners, pistons, piston rings, conrods and plain bearings. This applies as from the replacement of the above components.

If the engine unexpectedly shuts down during the running-in programme, the running-in programme must be continued from where it was interrupted by the shut-down.

NOTE



Leanox setting

While the engine is running, store both points required to set the Leanox controller when half load and full load are reached.

4 Procedure

Before carrying out the engine running-in programme, follow the **Inspection instruction - Daily inspection procedure**.



Initial commissioning of new engines

Having finished the engine running-in programme according to procedure (as described in section 5), carry out **Maintenance following initial commissioning**.

5 Engine running-in programme

NOTE



Potential engine damage when running in

Unusual sounds, vibrations and temperature phenomena

- Make sure that, if required, engine operation can be stopped immediately by pressing the EMERGENCY STOP button.
- Ensure that the EMERGENCY STOP button is freely accessible at all times.

NOTE



Deactivation of the quick start function before running-in

If the engine is fitted with the quick start function, deactivate it before starting the engine for the first time and during running-in. The quick start function should not be activated until running-in has been successfully completed in order to ensure the best possible performance of the mechanical systems.

Type 2, 3, 4 and 6 engines:

The purpose of the running-in stages (five minutes each) is to check the mixture setting using the exhaust gas emission measurement. NOx emissions must not exceed 750 mg NOx/Nm³ at 5% O₂ in the exhaust gas.

Type 9 engines:

The first running-in stage, with the engine delivering power, is to check the mixture setting using the exhaust gas emission measurement. NOx emissions must not exceed 750 mg NOx/Nm³ at 5% O₂ in the exhaust gas.

5.1 Running-in programme for Type 2, 3 and 4 Jenbacher gas engines

The following steps must be observed before starting the engine:

1. Switch on the prelubrication pump for 5-10 minutes to flush the oil through the engine channels and bearings.
2. Turn the crankshaft manually through at least 2 complete rotations during the flushing process while the prelubrication pump is in operation.

Work through the running-in stages one after the other in order.

Once the rated power has been reached, maintain it for 30 minutes and then finish the running-in procedure.

Do not overload!

Running-in stage	Stage running time	ELECTRICAL POWER					
		J 208	J 212	J 216/ J 312	J 316/ J 412	J 320/ J 416	J 420
	Min.	kW	kW	kW	kW	kW	kW
1	5	0	0	0	0	0	0
2	5	35	50	65	90	120	150
3	5	85	130	160	220	290	360
4	10	130	205	250	350	470	580
5	10	200	305	380	520	700	870
6	10	265	410	510	700	930	1160
7	30	Rated power	Rated power	Rated power	Rated power	Rated power	Rated power

5.2 Running-in programme for Type 6 Jenbacher gas engines

The following steps must be observed before starting the engine:

1. Switch on both prelubrication pumps for 5-10 minutes to flush the oil through the engine channels and bearings.
2. Turn the crankshaft manually through at least 2 complete rotations during the flushing process while the prelubrication pump is in operation.
3. Work through the running-in stages one after the other in order. Once the rated power has been reached, maintain it for 60 minutes and then finish the running-in procedure.

Do not overload!

Running-in stage	Stage running time	ELECTRICAL POWER					
		J 612	J 616	J 620	J 624		
	Min.	kW	kW	kW	kW		
0	2-5 ¹⁾	Idling mode	Idling mode	Idling mode	Idling mode		
1	5	500	700	800	1100		
2	10	900	1200	1500	2000		
3	10	1500	2000	2500	3300		
4	10	1700	2300	2800	3700		
5	10	1800	2400	3100	4000		
6	10	1900	2600	3200	4200		
7	60	Rated power	Rated power	Rated power	Rated power		

¹⁾ Idling: Never less than 2 minutes, not less than 5 minutes *if possible*

5.3 Running-in programme for Type 9 Jenbacher gas engines

Work through the running-in stages one after the other in order.

Do not overload!

Before starting the engine, the following steps must be observed (applies when starting the engine for the first time and after replacing main or big-end bearings):

1. Switch on the prelubrication pump and set the prelubrication pressure to 1.2 bar. Oil temperature > 30°C.
2. Flush the engine channels and bearings for 30 minutes.
3. Interrupt the flushing process for five minutes.
4. Switch on the prelubrication pump again and then use the turning device to rotate the crankshaft through 60°.
5. Flush the engine channels and bearings for 15 minutes.
6. Repeat steps 3 through 5 a total of five times (one complete rotation of the crankshaft).

Running-in programme for new engines, or after replacing the main or big-end bearings

Running-in stage	Speed	P _{el}	Stage running time	Total running time
[-]	[rpm]	[% of the rated power]	[min]	[h]
1	500	0	5	0.08
2	Rated speed	15	5	0.17
3	Rated speed	20	5	0.25
4	Rated speed	25	5	0.33
5	Rated speed	30	10	0.50
6	Rated speed	35	10	0.67
7	Rated speed	40	15	0.92
8	Rated speed	45	15	1.17

Running-in stage [-]	Speed [rpm]	P _{el} [% of the rated power]	Stage running time [min]	Total running time [h]
9	Rated speed	50	15	1.42
10	Rated speed	55	15	1.67
11	Rated speed	60	20	2.00
12	Rated speed	65	20	2.33
13	Rated speed	70	20	2.67
14	Rated speed	75	20	3.00
15	Rated speed	80	30	3.50
16	Rated speed	85	30	4.00
17	Rated speed	90	30	4.50
18	Rated speed	95	30	5.00
19	Rated speed	100	60	6.00
20	Rated speed	0	5	6.08

**Running-in programme after repairs or maintenance (piston rings, pistons and cylinder liners)
apart from replacing the main or big-end bearings**

Running-in stage [-]	Speed [rpm]	P _{el} [% of the rated power]	Stage running time [min]	Total running time [h]
1	500	0	5	0.08
2	Rated speed	15	5	1.17
3	Rated speed	20	5	0.25
4	Rated speed	25	5	0.33
5	Rated speed	30	5	0.42
6	Rated speed	35	5	0.50
7	Rated speed	40	5	0.58
8	Rated speed	45	5	0.67
9	Rated speed	50	10	0.83
10	Rated speed	55	10	1.00
11	Rated speed	60	10	1.17
12	Rated speed	65	10	1.33
13	Rated speed	70	10	1.50
14	Rated speed	75	15	1.75
15	Rated speed	80	15	2.00
16	Rated speed	85	15	2.25
17	Rated speed	90	15	2.50
18	Rated speed	95	15	2.75
19	Rated speed	100	60	3.75

6 Additional guidance for first start-up

Any kind of work on an engine or generator could potentially result in risk.

! WARNING



Risk of injury during running-in procedure

- Except to conduct absolutely necessary work, nobody may be in the engine room when the engine is started for the **first** time after performing relevant service jobs.
- Access to the engine room is only permitted after full load has been reached and the engine has been running stably under full load for 15 minutes.

Such 'relevant' service jobs could involve either the commissioning of new and overhauled units or the repair/replacement of rotating/oscillating parts.

7 Revision code

Revision history

Index	Date	Description / Revision summary	Expert Auditor
14	31.07.2019	Kapitel Motoreinlaufprogramm für J624 mit bleifreien Lager entfernt / Chapter Running-in programme J624 with lead-free bearings removed Vereinheitlichung und Anpassung der Einfahrstufen für alle Baureihe 6 Motoren / Harmonization and adaptation of the running-in stages for all type 6 engines Hinweis für Deaktivierung der Schnellstart-Funktion ergänzt / Note for deactivating the fas start function added	Frigge P. <i>Waldron P.</i>
13	30.04.2019	GE durch INNIO ersetzt / GE replaced by INNIO	Opoku <i>Pichler R.</i>
12	29.09.2017	Anpassungen Kapitel 5.2 und 5.3 / Adaption chapter 5.2 and 5.3	Neiteler R. <i>Waldron P.</i>
11	27.04.2017	Änderung Kapitel 5.2 / Change chapter 5.2	Neiteler R. / Lang J. <i>Waldron P.</i>
10	30.11.2016	Korrekturen Kapitel 3 und 5.3 / Corrections chapter 3 and 3.5	Rangger A. <i>Waldron P.</i>
9	30.09.2016	Anpassungen Kapitel 3 und 5 / Adaption chapter 3 and 5	Waldron P. <i>Waldron P.</i>