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# Product Technical Information
# Engine Running-in Guide

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## Engine Running-in Guidance – 6 Steps to a successful engine rebuild

It is essential that every rebuilt engine undergoes a running in procedure. Only by optimising the running in procedure can oil control and fuel efficiency be attained. Failure to do so will result in excessive oil consumption because the piston rings have not been correctly "bedded in" or "seated" into the cylinder bore.

Vapormatic recommends the following **6 step process below to ensure a successful rebuild**

**1** **Change the oil filter:** It is also recommended to change all filters including fuel and air filters.

**2** **Fill with a SAE 30 Running-in oil:** By using an SAE 10W-30 engine oil the mineral formulation will assist in avoiding bore glazing and provide protection for the valve train and associated components. This is important to allow the piston rings and bores to bed in and will assist the limited road use during running in. **Do not** re-use the existing engine oil or a use a low grade alternative

**3** **Flush the cooling system:** Prior to engine testing, it is recommended that the cooling system is flushed out and checked for any faults or blockages. This is essential as rebuilt engines will typically have improved compression and, as a result, will run at higher operating temperatures so an efficient cooling system is vital. Additionally check that the fan belt is in good condition.

**4** **Run/test the Engine:** There is no universal set of instructions for running-in an engine however, there are consequences to an unsuccessful running-in. A period of running-in should follow the following procedure:

**With dynamometer**

| *Time* | *Load* | *Engine Speed* | *Comments* |
|---|---|---|---|
| 5 minutes | No load | 800 rpm | Oil pressure, coolant temperature and evidence of any leaks. Immediatley stop the engine and correct the problem, if any of these factors are found to be outside normal conditions. |
| 5 minutes | No load | 1,500 rpm to 2,200 rpm | |
| 10 minutes | ¼ load | 2,000 rpm to rated speed | |
| 10 minutes | ½ load | 2,000 rpm to rated speed | |
| 10 minutes | ½ to ¾ load | 2,000 rpm to rated speed | |
| 10 minutes | ¾ to full load | Rated speed | |
| 2 minutes | No load | 1,500 rpm | |

**Without dynamometer**

| *Time* | *Load* | *Engine Speed* | *Comments* |
|---|---|---|---|
| 5 minutes | No load | 800 rpm | |
| 5 minutes | No load | 1,500 rpm to 2,200 rpm | |
| 30 minutes | ¼ - ½ load | 2,000 rpm to rated speed | Road or field test |
| 3 – 4 hours | ¾ load | 2,000 rpm to rated speed | Field operation, carried out by owner operator |

**5** **Check:** After testing it is important to ensure that the valve clearances and cylinder head torque settings are re-checked to ensure there has been no movement. It is not necessary to re-check the cylinder head bolts on engines that use "stretch bolts" such as JDPS 300 and PowerTech series engines. The engine should then operate for the first 100 hours avoiding overloading, excessive idling and **No load** operations.

**6** **100 hour Service:** After 100 hours an oil change and filter replacement is mandatory. The running-in oil with have done it's work and therefore, should be drained and refilled with a high quality oil, as recommended by the Original Equipment Manufacturer.

**Please note:** Failure to perform this 'running-in process' will jeopardise the product warranty.

All Vapormatic quality replacement parts carry an industry leading **12 month parts and labour warranty**. For further information on specific items please visit:
www.vapormatic.com

Original equipment manufacturers names and part number are quoted for reference purposes only and are not intended to infer that our replacement parts are used as original equipment.