

Engine Break-in

Installation Checklist

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Installers Check Sheet

Fuel System

A worn or incorrectly adjusted carburetor may lead to fuel wash of cylinder components, causing:

- premature wear of bores
- damage to pistons, rings and valves
- overheating
- poor performance and economy

The carburetor should be serviced with a service exchange unit.

A worn mechanical fuel pump may also lead to engine damage and should be checked for correct operation and replaced if suspected of being faulty.

Engines fitted with fuel injection should have pumps and injectors cleaned and recalibrated. All fuel filters should be replaced, fuel pipes cleaned out and leaks attended to. Internal leaks from fuel pumps will cause oil dilution and rapid wear of other engine components. If in doubt replace. All manifolds should be examined for cracks and flatness of joint faces. They should be checked for internal debris and blown clean with a air line to prevent ingress of foreign material into the engine. All breathers and breather pipes should be thoroughly cleaned.

Always fit a new air filter.

Ensure that the correct grade and type of fuel is used.

Distribution and Ignition System

A worn or incorrectly timed distributor may cause severe engine damage to:

- timing gears
- oil pump
- distributor drives

In addition, it may also cause detonation or pre-ignition, leading to piston, valve or spark plug damage and bearing failure.

Ensure that the advance and retard mechanism functions correctly.

Check that the distributor vacuum advance unit is working correctly. New ignition points (where fitted) should be adjusted to the correct gap and ignition timing set in accordance with the engines manufacturer's instructions.

Always fit new spark plugs of the correct grade. Following installation, the fuel and ignition settings, include E.C.U's (where fitted) should be checked and adjusted by electronic engine diagnostic equipment.

Radiator and Cooling System

To prevent overheating and possible seizure of your newly remanufactured engine, it is essential that the cooling system is in perfect condition. The radiator must be flushed out to ensure that it offers free flow of coolant.

In case of a high mileage vehicle, it is advisable to replace the radiator. A new thermostat of the correct type for the engine should be fitted and all hose clips should be checked. If in doubt, replace.

The condition of the water pump bearings, impeller and seals should be inspected and the pump replaced as necessary. Where fitted, the viscous fan coupling should be checked for wear and replaced as necessary.

Always fit a new fan belt.

The cooling system should be filled with a good quality anti-freeze and inhibitor.

Front Wheel Drive Gearboxes

In any instance where the gearbox acts as the sump of the engine, it is essential that the gearbox is thoroughly pressure or steam cleaned.

Commissioning the re-manufactured engine

1. Fill the engine with oil and coolant to the correct levels
2. Remove the spark plugs or blanks from the plug holes and rotate the engine with the starter motor. Continue rotating the engine by this method until the oil warning light goes out or until pressure is obtained on the oil gauge (where fitted).
3. Refit the plugs and start the engine. Check for oil and coolant leaks and ensure that the oil pressure is maintained.
4. Run the engine at approx. 1,000 RPM until normal operating temperature is reached. Stop the engine and re-adjust tappet clearances (where applicable). The cylinder head may require re-torquing but refer to the manufacturer's instructions as certain engines must not be re-torqued. the coolant system may require topping up and the elimination of air pockets from the heater may also be necessary.
5. Before road testing, the ignition timing should be checked using a strobe light. The recommended procedure is to remove the vacuum pipe and to check the timing at "idle" revs, using the timing light. With the vacuum pipe disconnected, check the mechanical advance at 3,000 RPM. Replace the vacuum pipe and re-check at 3,000 RPM. The precise settings should be as per manufacturer's specifications. **Serious damage may occur if the ignition system is not correctly set.**
6. Road test the vehicle and finally re-check for oil and coolant leaks and re-check oil and coolant levels.
7. Care in running-in the engine is required with sensible driving. Normal urban speeds may be used but do not labor the engine or use excessive speeds. Use the gearbox sensibly but do

Parts International High Performance & Quality Products B.V. – Bennebroekerdijk 205F – 2142LD –

Cruquius – Phone: +31(0)23 5288778 – Fax: +31(0)23 5290136 – Netherlands –

<http://www.dymotrack.nl> - info@dymotrack.nl -

not over-rev the engine in intermediate gears. Speeds may be progressively increased after 500 miles of driving but sustained high speed running, e.g. long periods of high motorway operation, should be avoided for a further 500 miles.

8. The engine oil and filters must be changed, cylinder head bolt torque settings and tappets re-adjusted after the first 500 miles where applicable (see manufacturer's instructions).

Installers Check Sheet

Check or Replace

1	Cooling system
	(e.g. Radiator, Water pump, Pipes, Hoses and Clips, Heater radiators, Thermostat etc.)
2	Fuel system
	(e.g. Injection equipment, Lift pump, Carburetor, Fuel filters etc.)
3	Turbo Charger
	(where fitted)
4	Oil cooler
	(where fitted)
5	Oil pump
	(if not fitted)
6	Engine breathing system
7	Exhaust system
8	Pulleys and crankshafts damper for wear
Replace	
9	Air filter
10	Oil filter (when not supplied)
11	Fuel filters (when not supplied)
Other suggested checks	
12	Clean all fuel lines
13	All oils to be to Manufacturer's specifications
14	Check battery condition
	(ensure that it is fully charged)
15	Check correct oil and fluid levels when in service
16	Check and re-torque cylinder head to Manufacturer's
	specification and re-adjust tappet settings
17	Any special of additional comments
Running-in guidelines	
18	Do NOT leave the re-manufactured engine idling
19	Do NOT over-rev or overload re-manufactured engines