

INSTRUCTIONS

Vacuum Pumps

Please Read These First

These instructions are intended as a guide only and are not a substitute for a workshop manual. The fitter must have a degree of mechanical competence. If you are in any doubt as to your ability to fit the part, do not undertake the job.

For more Technical Tips and to register your warranty online visit

www.smpe.co.uk

Contact technical sales on
01527 839307
www.smpe.co.uk

Instructions

A. Removal of the old pump

1. Clean the vacuum pump environment to prevent dirt from entering the engine while the vacuum pump is being replaced.
2. Disconnect the hose which joins the booster to the vacuum pump, loosening the clamp ring next to the vacuum pump.
3. Remove the bolts/nuts that hold the vacuum pump to the engine and gently remove.

B. Setting Up Precautions

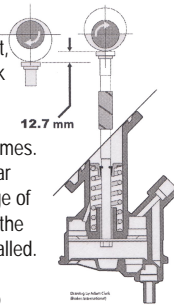
1. Check that the setting surface is clean and free from gaskets and sealants.
2. Check the condition of the vacuum hose and connection to the booster, paying special attention to the ends. If the vacuum circuit has leaks, it will absorb air, the booster performance will be affected and air will get into the crankcase.

For further instructions refer to the appropriate part number.

VPO01 Ford 1.8D

Very Important:

Check that the eccentric cam lobe has not worn. Measure the pushrod throw - see diagram. If wear is present, the camshaft must be replaced. Check that the pushrod has not worn. There must always be constant contact, with the spring kept under pressure at all times. Excessive tapping noise indicates wear and if not remedied will lead to damage of both the pump and engine. Don't start the engine without the vacuum pump installed.



C. Mounting the new vacuum pump

- 1 Remove the two red blanking plugs from the vacuum connections.
- 2 Mount the vacuum pump in position on the engine.
- 3 Be sure that the o-ring is correctly located in the groove.
- 4 Insert the two M8 retaining bolts and tighten.
- 5 Fit the oil discharge hose and tighten the clamp.
- 6 Start the engine and leave it at tick over for suction test.
- 7 Verify suction by covering the vacuum connection with a finger (for accurate measurements use a tester).
- 8 Connect the vacuum hose, ensuring a perfect seal.
- 9 Let engine run for 10 minutes. Check for oil leakage.
- 10 Check brake function by gently stabbing pedal repeatedly.

Note: If the brake pedal is too hard; verify that the booster and vacuum connections are connected and unrestricted. If these items are OK, go back to section B.

VPO02 Rotary Renault

Very Important: Verify the circulation of oil. When starting the engine in slow motion, a continuous oil flow must come out from the tip of the camshaft of approximately 1m. Take the necessary precautions as not to pour out the oil. The normal oil feeding is fundamental for the normal functioning of the pump.

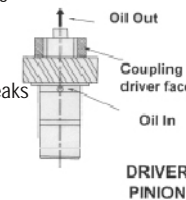
C. Setting the new vacuum pump:

- 1 Remove the packaging. Take the red plastic lids off.
- 2 Put the seal between the vacuum pump and the block. Making sure that the sealing o-ring is in the correct position.
- 3 Place the vacuum pump on the engine and make sure that it fits with the coupling of the camshaft. Align the fixing holes.
- 4 Fit and tighten the mounting screws.
- 5 Check the vacuum pump by starting the engine and when it is ticking over, control it with the tester. In case you don't have a vacuum pump tester, use a vacuum gauge or block the valve tip with a thumb to verify there is suction. If the vacuum pump works well, place the hose (avoiding sudden movements that may loosen or break the connection) and fix the brace. If the vacuum pump doesn't work correctly, go over the steps indicated in B (Setting-up precautions). Check oil leaks keeping the engine running for 10 minutes.
- 6 Try the brake. If the booster system does not work, revise the connections and the booster.

VPO03 Renault Traffic

Very Important: Check the oil inlet: Remove the coupling gear that commands the oil pump (see picture) and clean the oil pipe. The end has a calibrated passage with a 1mm diameter hole. The oil entrance is fundamental to ensure the correct functioning of the vacuum pump. Verify that the joint dragging is not deteriorated. If it is damaged, change it.

During the setting-up, do not damage the vacuum pump o-ring, which prevents oil leaks between the block and the vacuum pump.



C- Setting the new vacuum pump:

- 1 Remove the packaging. Take the red plastic lid off.
- 2 Put the hose in the vacuum pump connection (avoiding abrupt movements that may loosen or break the valve) and fasten the clamp ring.
- 3 Place the vacuum pump in the engine. Make sure that the vacuum assemblies with the coupling gear. Align them so that the fixing holes coincide.
- 4 Place and fasten the nuts.
- 5 Check the vacuum pump by starting the engine and when it is ticking over, control it with the tester. In case of not having it, use a vacuum gauge or block the hose end with a thumb to verify there is suction. If the vacuum pump works well, place the hose in the booster and fasten the clamp ring. If the vacuum pump doesn't work

correctly, go over the steps indicated in B (Setting-up precautions). Check oil leaks by keeping the engine running.

VPO04 Alternators

Very Important:

Check oil inlet. The oil entrance is fundamental to ensure the correct functioning of the vacuum pump. Check alternator axis: It is extremely important to be very cautious when setting up the vacuum pump on the alternator axis, since it determines the proper working of the equipment and its durability.

Check the grooves of the alternator axis, because, if the replacement is due to the wearing away of the rotor grooving, it is possible that the alternator axis is also damaged (worn away or broken teeth). In this case, replace the axis as well. If the alternator is disassembled or the position of the axis is altered, check that the axis is perpendicular to the three supports of the vacuum pump legs. This causes friction and affects the performance of the vacuum pump.

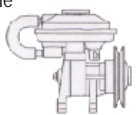
Do not damage the o-ring, which prevents oil leaks between the alternator and the vacuum pump. The alternator has in its axis an oil seal which completes the sealing.

C- Setting the new vacuum pump:

- 1 Remove the packaging. Take the three red plastic lids off.
- 2 Place the vacuum pump on the alternator, turning it around until the holes fit.
- 3 Insert and fasten the three nuts. Check that the alternator spins freely.
- 4 Fix the oil inlet hose through its connection and the oil outlet hose by fastening the clamp ring.
- 5 Check the vacuum pump by starting the engine and when it is ticking over. Then use a vacuum gauge or block off the valve tip with a thumb to verify there is suction. If the vacuum pump doesn't work correctly, go over the steps indicated in B (setting up precautions). Check oil leaks by keeping the engine running for 10 minutes.
- 6 Try the brake. If the booster system does not work, revise connections and booster.

VPO05/6 Alternators

Very Important: Don't add oil to the vacuum pump through the upper lid because the diaphragm will be seriously damaged. Check there is no wear of the engine bracket. If this is so, there is a vacuum pump with play compensation (VP005), although this difficulty can also be solved by using right thickness washers.



If it is installed on another vehicle, check the vacuum deposit to see it does not have any oil. This should be done in case a rotary

PTO

vacuum pump is replaced.

C- Setting the new vacuum pump:

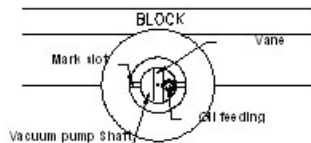
- 1 Remove the packaging. Take the red plastic lid off.
- 2 Put the vacuum pump on the engine bearing plates and insert the bolt.
- 3 Put the belt in the pulley and tighten it through the groove with an appropriate tension.
- 4 Fasten the two bolts.
- 5 Check the vacuum pump by starting the engine and when it is ticking over, control it with the tester. In case of not having it, use a vacuum gauge or block the end of the small cup pipe with a finger to verify there is suction. (The end of the small cup pipe is the place where the hose that joins it to the booster will be connected afterwards). If the vacuum pump works well, place the hose that connects it to the booster (avoiding abrupt movements that may unfasten the pipe and the small cup.) If the vacuum pump doesn't work correctly, go over the steps indicated in B (Setting-up precautions.) Check oil leaks by keeping the engine running for 10 minutes.
- 6 While working, the vacuum pump may produce a noise due to air passage. This is something normal for this type of vacuum pump.
- 7 Try the brake. If it does not work properly, revise connections and booster.

VPO07/8 VW

Very Important: Check oil inlet: When removing the vacuum pump, the oil pump shaft can be seen in the block setting. The shaft has a bearing with a flange. (See picture 1). On the flange, the bearing has a mark (slot) which has to remain parallel to the block. The slot shows the position of the bearing so that its hole fits in with the block oil vent. The oil feeding is fundamental to ensure the correct functioning of the vacuum pump.

Do not damage the oil seal located in the gear while assembling it with the oil pump shaft. The oil seal avoids oil leaks,

ensuring that oil gets to the vacuum pump. Make sure that the o'ring, which prevents oil leaks between the block and the vacuum pump, is correctly placed. Do not start the engine without setting the vacuum pump.



C- Setting the new vacuum pump:

- 1 Remove the packaging. Take the red plastic lid off.
- 2 Put the vacuum pump in the engine, in the position marked according to step A-4, so as to be able to set the flange with the bolt. Rotate the vacuum pump until placing it in the correct position. Fasten the bolt.

- 3 Check the vacuum pump by starting the engine and when it is ticking over, control it with the tester. In case of not having it, use a vacuum gauge or block the valve tip with a thumb to verify there is suction. If the vacuum pump works well, place the hose (avoiding sudden movements that may loosen and break the valve) and fasten the clamp ring. If the vacuum pump doesn't work correctly, go over the steps indicated in B (Setting-up precautions). Check oil leaks by keeping the engine running for 10 minutes.
- 4 Try the brake. If the booster system does not work, revise connections, Booster and oil feeding.

VPO09 Rotary

Very Important:

Check oil inlet: The oil feeding is fundamental to ensure the correct functioning of the vacuum pump.

Verify the wear of the gear. If it is in optimum conditions, set it up. Make sure that the sealing element between the block and the vacuum pump is correctly placed, to avoid oil leaks.

C- Setting the new vacuum pump:

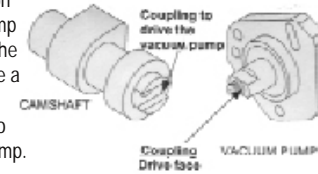
- 1 Remove the packaging. Take the red plastic lids off. Put the nipple of the hose connecting to the booster brake in the vacuum pump.
- 2 Put the sealer when setting the vacuum pump in the engine, aligning it to allow the fastening.
- 3 Place and fasten the elements that fix the vacuum pump flange to the engine.
- 4 Connect the oil inlet by means of the threaded nipple.
- 5 Check the vacuum pump by starting the engine and when it is ticking over, control it with the tester. In case of not having it, use a vacuum gauge or block the valve tip with a thumb to verify there is suction. If the vacuum pump works well, place the hose. If the vacuum pump doesn't work correctly, go over the steps indicated in B (Setting-up Precautions). Check oil leaks by keeping the engine running for 10 minutes.
- 6 Try the brake. If the booster system does not work, revise connections and booster.

VPO10 Diesel

Very Important:

Check the oil inlet: Once the vacuum pump has been dismantled, check if oil flows out of the camshaft; if it is not so, verify the oil circuit. The oil entrance is fundamental to ensure the correct functioning of the vacuum pump.

Control the connection between vacuum pump shaft and camshaft: the camshaft should have a slot with the appropriate surface to drive the vacuum pump.



Do not damage the o'ring of the axis end when assembling it to the camshaft. This movement should be performed with minimal effort; on the contrary, verify edges in the camshaft hole. The o'ring avoids oil leaks, ensuring that oil gets to the vacuum pump.

Make sure that the o'ring, which prevents oil leaks between the block and the vacuum pump is correctly placed.

C- Setting the new vacuum pump:

- 1 Remove the packaging. Take the red plastic lid off.
- 2 Pre-set the vacuum pump to make it sure that there is no interference between joints.
- 3 Place and Fasten the nuts.
- 4 Check the vacuum pump by starting the engine and when it is ticking over, control it with the tester. In case of not having it, use a vacuum gauge or block the valve tip with a thumb to verify there is suction. If the vacuum pump works well, place ...the hose. If the vacuum pump doesn't work correctly, go over the steps indicated in B (Setting-up precautions). Check oil leaks by keeping the engine running for 10 minutes.
- 5 Try the brake. If the booster system does not work, revise connections and booster.

VPO013/14

Very Important

Ensure that the oil supply from the cylinder head is not obstructed. The oil feed to the vacuum pump is fundamental to the life of the replacement unit. Any restrictions will have a detrimental effect.

C- Fitting the new unit:

- 1 Remove all packaging including the red plastic bungs/covers
- 2 Fit the pump to the engine, ensure that the coupling engages correctly into the camshaft. Align the three fixing holes.
- 3 Refit and secure the three mounting bolts
- 4 Refit the hose into the connection, (caution the connection is easily damaged) fasten the clamp.
- 5 Start the engine and check the function of the pump. Ideally with a vacuum pump tester or a vacuum gauge.
- 6 Refit the vacuum hose to the servo unit
- 7 Check for oil leaks by keeping the engine running for at least

10 minutes.

8 Test the brakes, if the servo is inoperative recheck the hose/connections and servo unit

IMPORTANT!

It has been noted that replacement cylinder heads are supplied with the vacuum pump oil feed gallery blocked with a screw plug. It is important to remove this plug prior to fitting the servo pump. Without this oil feed the pump will cease to function..

VERY IMPORTANT

Remove the oil-gallery/blanking plug when fitting a replacement cylinder head