

PERKINS 4107 & 4108 MARINE DIESEL ENGINE

This engine was a popular choice and was the 'default' engine fitted to Elysians back in the late 60's and through most of the 70's. However expensive spare parts together with too much horse power (48 bhp) were seen by most Hire Fleet operators as unnecessary. Most Elysians destined for a hard working life of hire use were fitted with the 1.5 BMC diesel which was seen to be more user friendly.

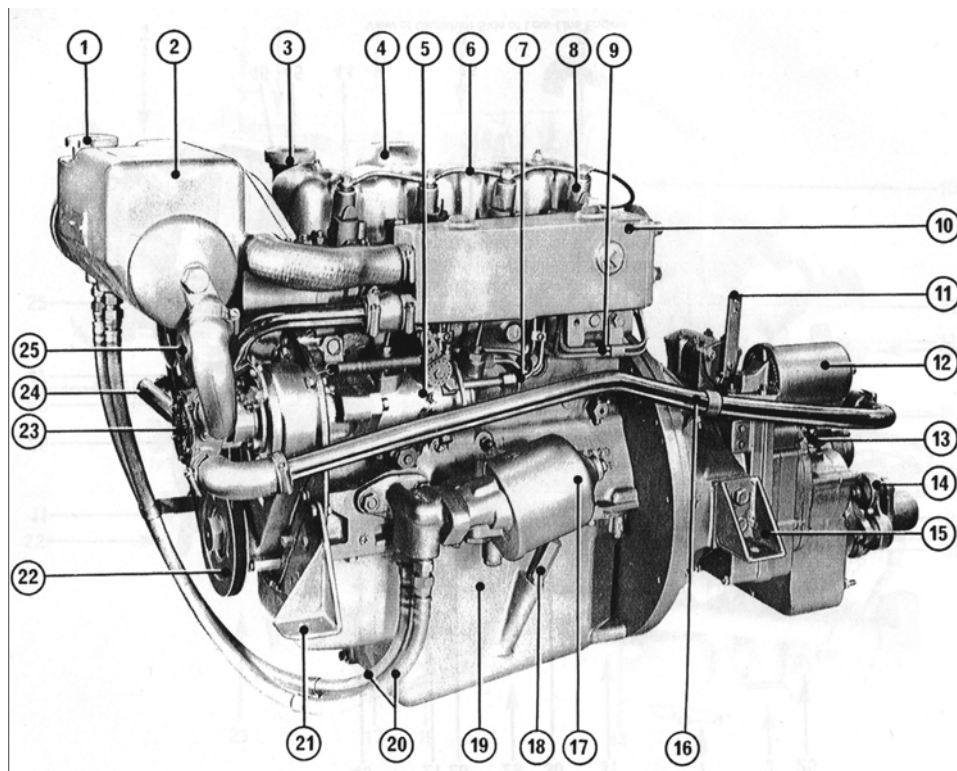
So what does 4107 mean....? Perkins used to name all their engines using the following method.

Number of cylinders and overall cubic capacity. For example

4 = 4 cylinder

107 = 107 cubic inches or 1,760cc (1.8 to keep it simple...!)

Just to confuse you, Perkins up rated the 4107 and called it a 4108 although the cylinder capacity is the same (1,760cc). The main difference between the two engines was the 4107 had wet liners (cylinders) and the 4108 was given dry interference fit cylinders. Other modifications included improving the size and strength of the cylinder head studs/bolts and on later 4108's an all new cooling system replaced the front mounted header tank. Use the guide below and take a good look around this typical Perkins 4107 and early 4108 engine.



- | | |
|--|---|
| 1. Fresh water filler cap | 14. Output flange |
| 2. Header tank | 15. Rear engine support |
| 3. Oil filler cap | 16. Water pipe, gearbox to sea water pump |
| 4. Air filter | 17. Lubricating oil filter |
| 5. Fuel injection pump | 18. Connection to oil sump pump |
| 6. Atomiser leak off pipe | 19. Sump |
| 7. Pressure pipes, injection pump to atomisers | 20. Oil cooler |
| 8. Atomiser | 21. Front engine support |
| 9. Fuel pipes, filter to injection pump | 22. Crankshaft pulley |
| 10. Exhaust manifold | 23. Sea water pump |
| 11. Ahead and astern engagement lever | 24. Water pipe exhaust manifold to cylinder block |
| 12. Gearbox oil filler | 25. Fresh water pump |
| 13. Reduction gearbox oil filler | |

How to keep your PERKINS 4107 & 4108 happy...!

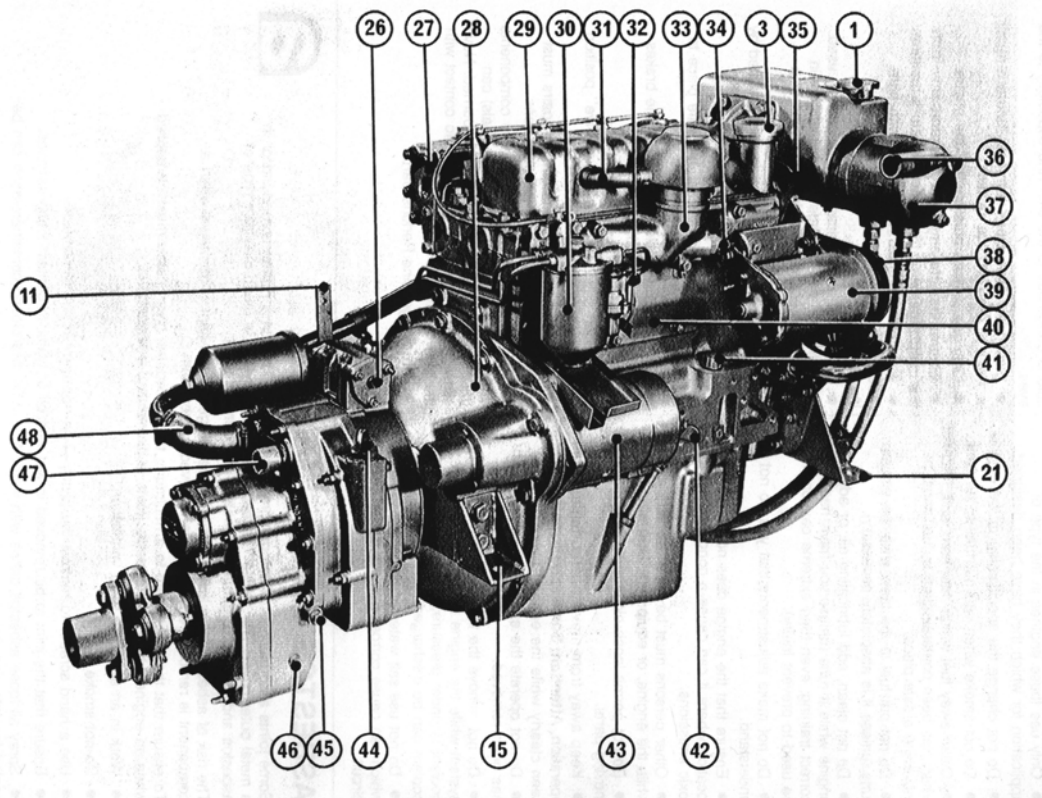
The Perkins engine will run for years (20 or more) on the average private boat before any major rebuilding or reconditioning is required.

However, there are two things which must not be ignored if you want long term reliability from your 4107 or 4108.

1. Lack of oil changes. These engines are prone to 'sludging' leading to eventual main bearing seizure. The problem is not so bad with engines running without an oil cooler. However, some were fitted with oil coolers and at river speeds the oil never reaches adequate temperature and can remain 'thick' which is not a problem providing the oil is clean and changed every 100 hours or 2 months (whichever comes first)

2. Overheating caused by lack of water coolant is a problem to any engine. The Perkins cylinder head will not tolerate being run 'dry' and have been known to crack. So always ensure your oil and water levels are checked daily when cruising.

All said and done, the Perkins 4107 & 4108 is a strong unit which unlike the BMC likes to rev up to 3000 rev/min for commercial use and rated to 4,000 for high speed pleasure craft. Most owners engines never see more than 2000 rev/min which is why these solid performers last for years without any need for major mechanical overhauls.



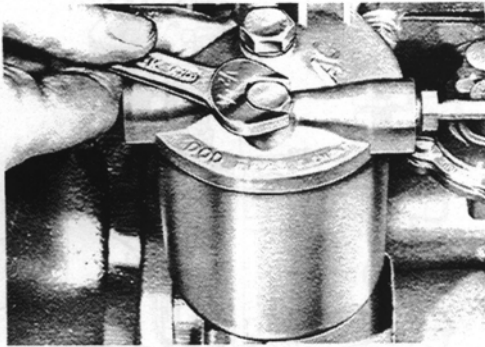
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|---------------------------------------|-------------------------------------|
| 1. Fresh water filler cap | 31. Breather pipe |
| 3. Oil filler cap | 32. Fuel lift pump |
| 11. Ahead and astern engagement lever | 33. Induction manifold |
| 15. Rear engine support | 34. Cold starting aid |
| 21. Front engine support | 35. Front lifting eye |
| 26. Gearbox pressure gauge connection | 36. Sea water outlet connection |
| 27. Rear lifting eye | 37. Engine oil cooler |
| 28. Flywheel housing | 38. Dynamo/alternator belt |
| 29. Cylinder head cover/rocker cover | 39. Dynamo/alternator |
| 30. Fuel filter | 40. Tappet inspection cover |
| | 41. Tachometer drive |
| | 42. Dipstick |
| | 43. Starter motor |
| | 44. Gearbox dipstick |
| | 45. Gearbox water drain plug |
| | 46. Reduction box oil level plug |
| | 47. Gearbox water inlet connection |
| | 48. Gearbox water outlet connection |

Note- This diagram shows TMP gearbox with reduction case. Other gearbox's such as Borgwarner were also fitted

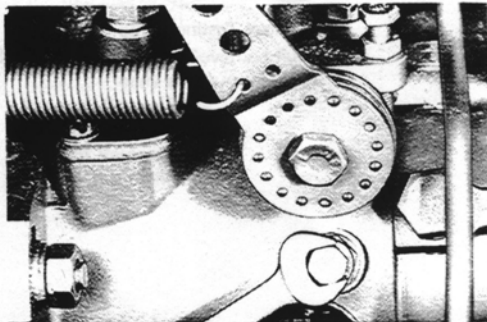
Bleeding your 4107 & 4108 fuel system

This step by step guide should help you bleed and vent any air from your Perkins fuel system. If you have changed a fuel filter or had any fuel problems which may of caused air to enter the system, then the following instructions should get you on your way....
Note. If you are unsure about any of the instructions below, always consult your local marine engineer.

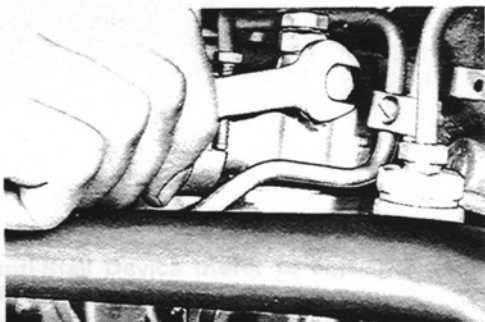
AIR FILTER AND FUEL SYSTEM—N.8



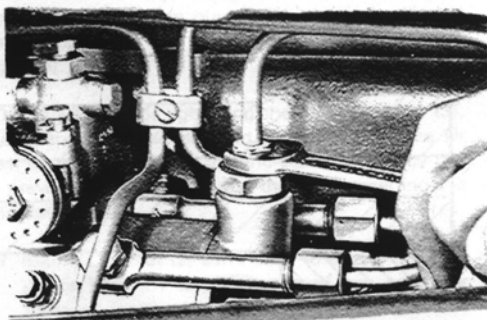
N11 Slackening Vent Screw on Filter Head Casting.



N12 Slackening Vent Screw on Hydraulic Head Locking Screw.



N13 Slackening Vent Screw on Governor Housing.



N14 Slackening Pipe Union Nut at Fuel Injection Pump Inlet.

Priming the Fuel System

The air must be vented from the fuel system whenever any part of the system between the fuel tank and injection pump has been disconnected for any reason, or when the system has been emptied of fuel.

No attempt must be made to start the engine until the injection pump has been filled and primed as serious damage can be caused to the pump due to lack of lubrication.

The method of priming detailed below, ensures that only fuel which has passed through the paper filter element can reach the interior of the pump.

1. Loosen the vent screw (Fig. N11) on top of the filter. Where a vent screw is not fitted, loosen the return to tank banjo bolt on top of the filter.
2. Operate the priming lever on the fuel lift pump (see Fig. N4) and when fuel, free of air, flows from the vent or banjo connection, tighten the vent screw or banjo bolt. If the drive cam of the fuel lift pump is at maximum lift it will not be possible to operate to operate the lift pump and the crankshaft must be turned through one revolution.
3. Ensure that the stop control is in the 'run' position. If an electric solenoid stop control is used, turn the key of the start switch to the 'R' position. Set the throttle to fully open.
4. Loosen the vent screw on top of the control gear housing, on hydraulically governed fuel pumps (see Fig. N13) or on the rear of the governor housing on mechanically governed fuel pumps. Loosen the vent screw in the locking bolt of the hydraulic head, (Fig. N12), for both types of fuel pump. Operate the priming lever on the fuel lift pump until fuel, free of air, flows from the vents. Tighten the vent screw in the locking bolt of the hydraulic head and then the vent screw on the governor housing or control gear housing.
5. Where a Therostat cold starting aid is fitted and the fuel pipe has been drained, loosen the pipe connection at the starting aid. Operate the priming lever of the lift pump until fuel, free of air, flows from the connection and tighten the connection.
6. Loosen the high pressure pipe connections at two of the atomisers. Ensure that the manual stop control, if fitted, is in the run position. Operate the starter motor until fuel, free of air, comes from the pipe connections, tighten the high pressure pipe connections. The engine is now ready to start.

If after priming the fuel system, the engine starts, runs satisfactorily for a few minutes and then loses power, misfires or stops and when checked the system is found to be full of air, then a leak on the suction side is indicated.