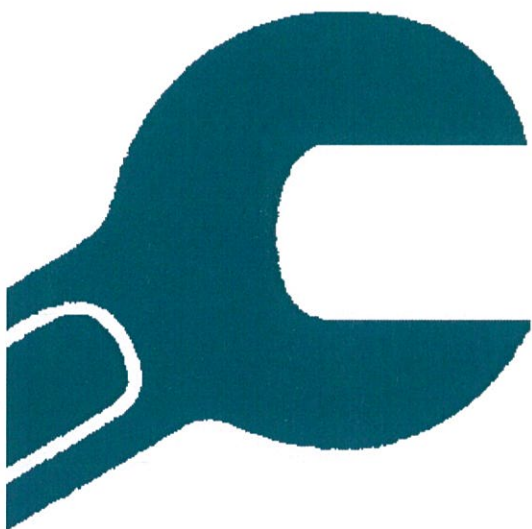


Workshop Manual

Engine unit

A
2 (0)

MD6A, MD7A



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**VOLVO
PENTA**

Workshop Manual

Marine diesel engines MD6A, MD7A

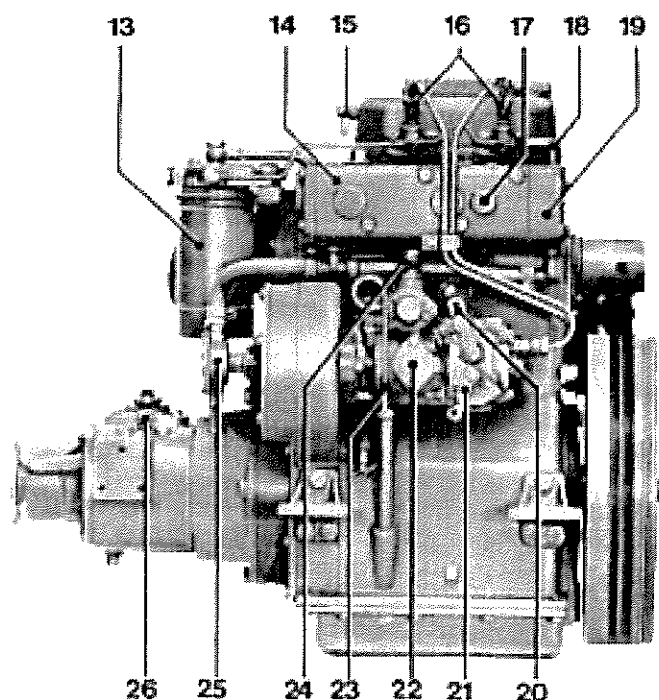
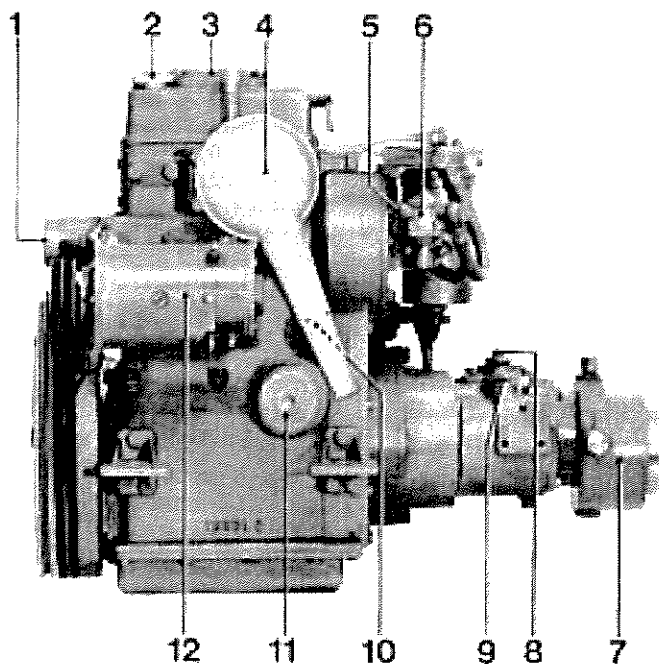
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Presentation

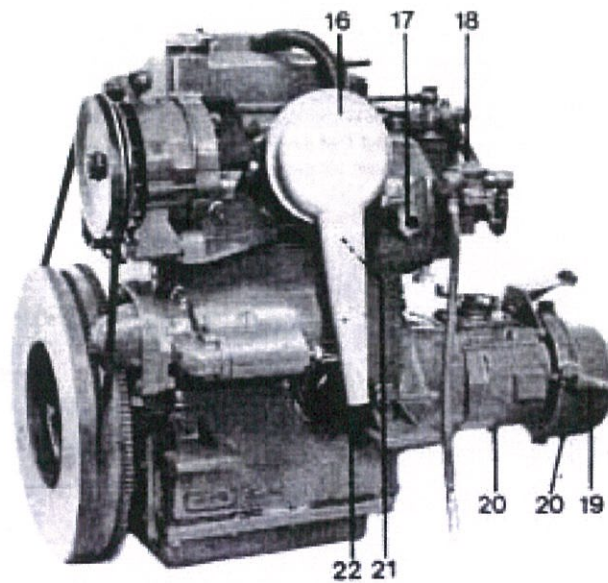
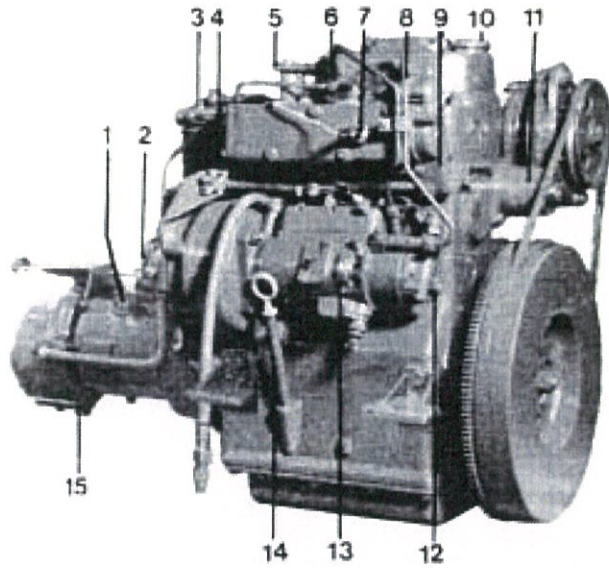
MD6A

1. Recess for starting crank
2. Oil filling, engine
3. Sealed crankcase ventilation
4. Intake silencer
5. Connection, fuel inlet
6. Feed pump
7. Reduction reverse gear MS, red. 1.91:1
8. Control lever, reverse gear
9. Oil filling, reverse gear
10. Oil pressure contact
11. Lubricating oil filter
12. Start-generator
13. Fuel filter
14. Water-cooled exhaust manifold
15. Decompression handle
16. Injectors
17. Temperature sender
18. Cooling water outlet
19. Thermostat housing
20. Throttle lever
21. Stop lever
22. Fuel injection pump
23. Oil dipstick, engine
24. Fuel return line connection
25. Sea-water pump
26. Oil dipstick, reverse gear

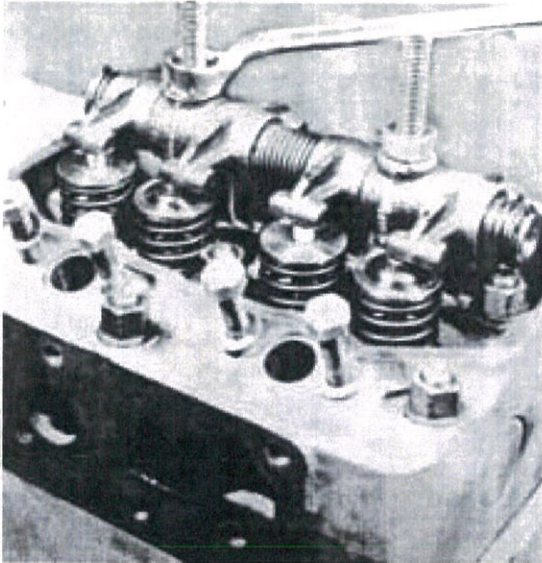


MD7A

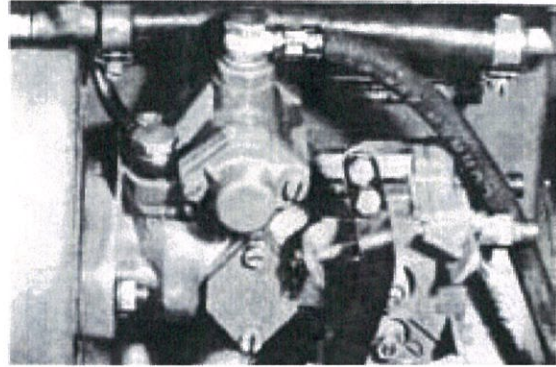
1. Oil dip-stick and oil filling, reverse gear
2. Cover, cooling water pump
3. Bleed-screw, fine filter
4. Fine filter
5. Decompression handle
6. Pressure pipe nut
7. Temperature sender
8. Injector
9. Thermostat housing
10. Oil filling, engine
11. Hand start
12. Cooling water drain, engine
13. Fuel injection pump
14. Oil dip-stick, engine
15. Cooling water drain, reverse gear
16. Air cleaner and intake silencer
17. Sender, rev, counter
18. Fuel pump (with hand pump)
19. Cooling water inlet, reduction gear
20. Oil drain, reverse gear, reduction gear
21. Warner, low oil pressure
22. Oil filter



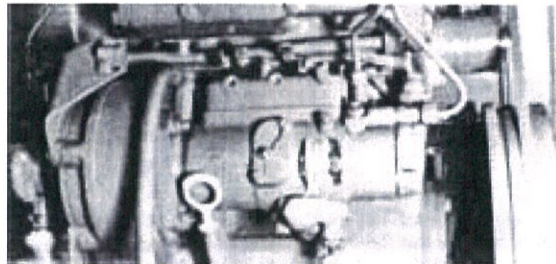
5. Remove the rocker arm cover (2 nuts), the intake manifold (4 bolts), the rocker arm (2 nuts) and the cylinder head (9 bolts). Take care of the washers.



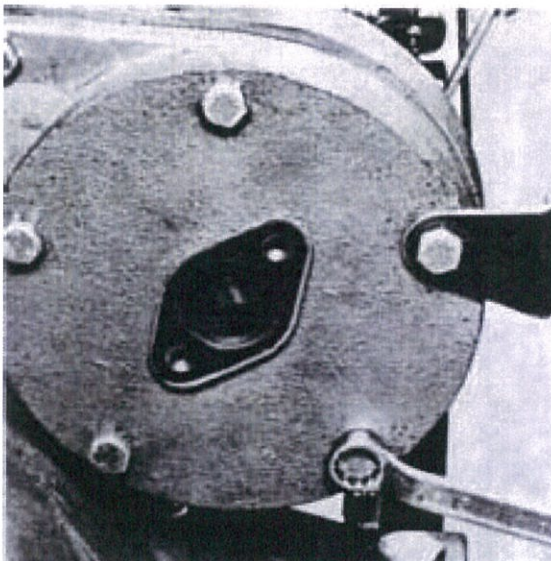
7. a. (BOSCH pump) Disconnect the pipe from the fuel filter and remove the nuts for the fuel injection pump.



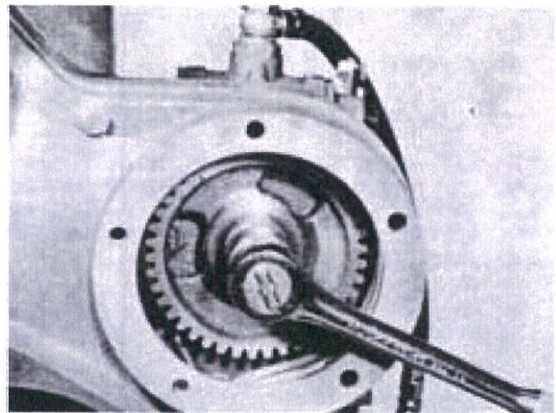
7. b. (CAV pump) Disconnect the pipe from the fuel filter and remove the nuts for the fuel injection pump.



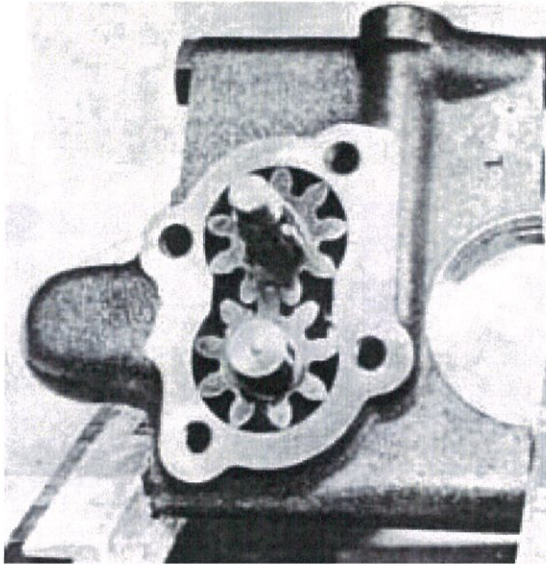
6. Remove the cover on which the water pump is mounted. NOTE! Two of the five bolts are shorter than the other three and are placed towards the centre of the engine. Take care of the control bracket. Discard the old gasket.



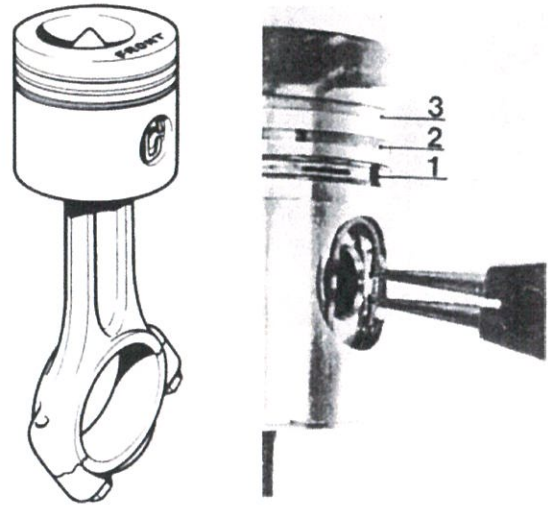
8. Remove the nut which drives the water pump. Use the flywheel as a counterhold. Remove the fuel injection pump and the gear wheel.



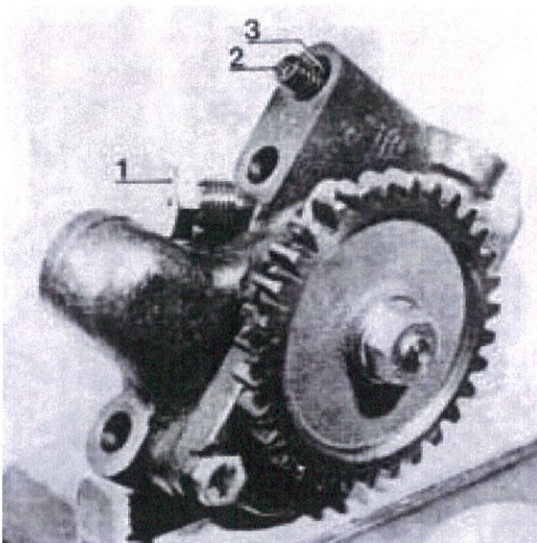
25. Re-fit the gears as shown in the Fig. below. Fit the cover together with a new gasket. Tighten up the 4 bolts and rotate the shaft to make sure that it does not jam. Fit the key in its groove and re-fit the gear wheel. Fit the spring washer and tighten up the gear with the nut.



27. Check for wear on pistons, piston rings and gudgeon pins. Replace if necessary. The piston and connecting rod must be matchfitted as shown in fig. A. Make absolutely certain that the groove ring for the gudgeon pin is fitted in its groove. The piston rings are fitted with a piston ring rod. Begin with the oil ring 1 (fig B) in the lowest groove. Continue with the compression ring 2. Finally fit the compression ring 3. NOTE! The marking TOP must face upwards. The other two rings can be faced as desired.

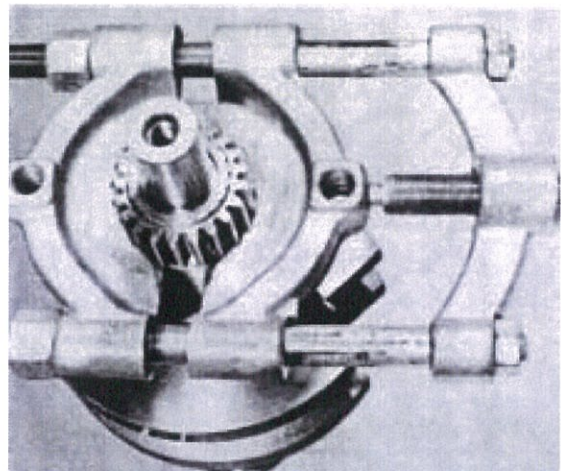


26. Remove the bolt 1 for the relief valve and check that the spring 2 and piston are in good condition. If there is anything suspicious about the opening pressure of the relief valve, check the data for the spring. See under "Technical Data, Lubricating oil pump". Clean and re-fit the piston and spring and tighten up the bolt.



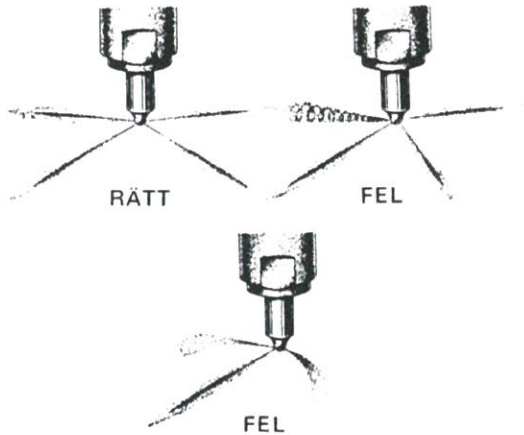
Crankshaft

28. Check the drive gear on the crankshaft for wear or damage. Remove the drive gear with a puller. Remove the key and clean the shaft. Check for wear and grind the shaft if necessary. (See under "Technical Data".) Clean the engine block and all other parts which must be re-fitted.



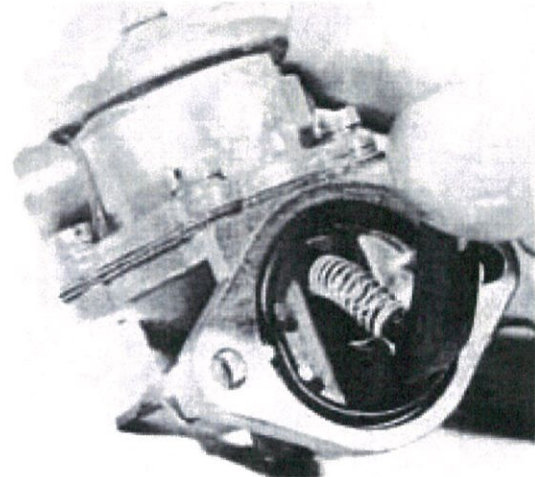
Pressure-testing the injectors

37. Check the spray pattern at an opening pressure of 180 k_p/cm² (2560 lbf/in²). Also check that the fuel jets cease simultaneously at all four holes and there is no dripping afterwards.



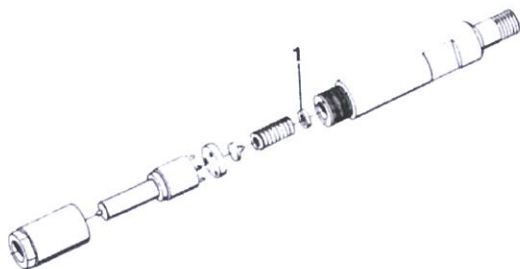
Overhauling the feed pump

39. Exert force on the pump lever (see Fig.). If the pump "squeaks" then it is in good condition. If it does not, the diaphragm must be replaced. This is done as follows:

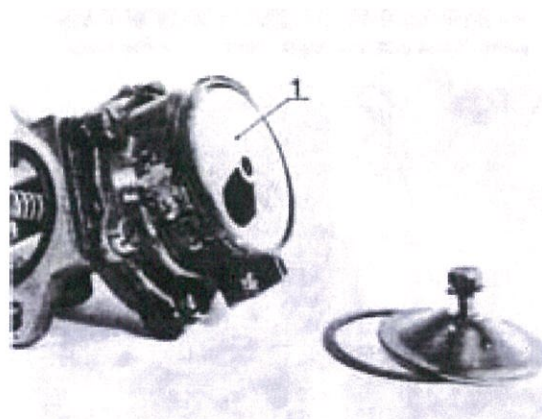


Adjusting the opening pressure

38. Adjust the opening pressure with adjuster washers 1, which are available in different thicknesses ranging from 1 mm (0.04") to 1.95 mm (0.08") at intervals of 0.05 mm (0.002") between each washer. Screw apart the injector and replace the adjuster washer with a thinner or thicker one depending on whether the pressure has to be reduced or increased. Screw the injector together again and check the opening pressure and spray pattern. Continue this procedure until results are satisfactory.

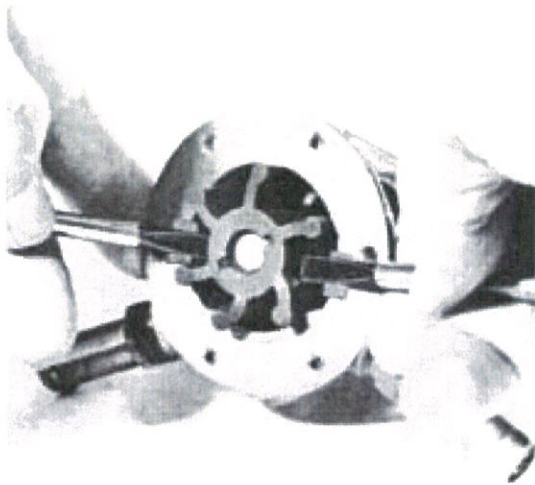


40. Release the cover centre screw, lift out the strainer 1 and clean it.

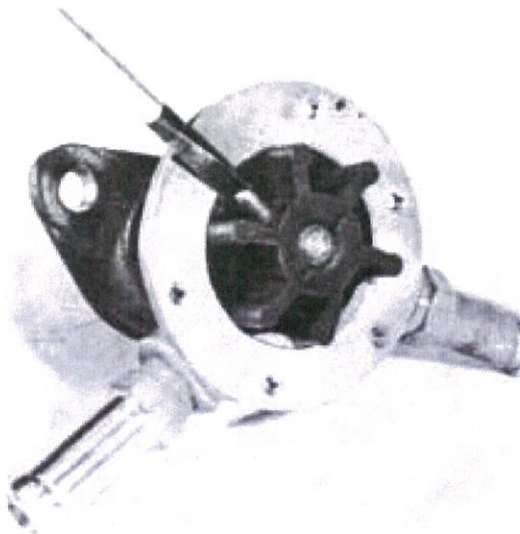


Overhauling the sea-water pump

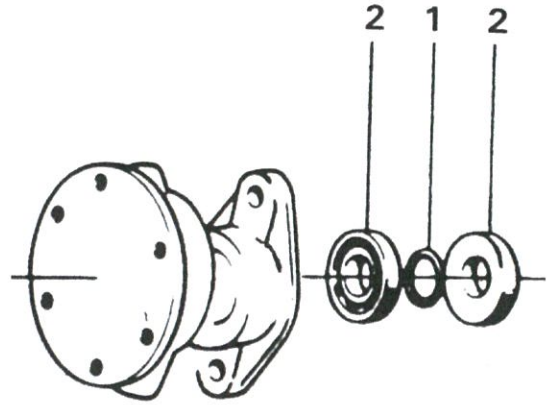
45. Remove the cover (6 bolts). Replace the impeller with the help of two screwdrivers or similar tools. **IMPORTANT!** Protect the edges on the pump body. See Fig. below. Lever out the impeller with the screwdrivers so far that the bolt becomes visible.



46. Unscrew the bolt and pull the impeller off the shaft. If the sealing rings also have to be replaced, the shaft can be pulled out entirely together with the impeller, after which the bolt can be released.



47. Remove the sealing rings 2 and the 0-ring 1 (earlier engines), and clean the pump body and shaft. (**IMPORTANT!** The pump must be removed from the engine.) Check to make sure there is no burr on the shaft. **NOTE!** A new 0-ring must not be fitted.



48. Fit new sealing rings. **IMPORTANT!** Turn the sealing rings so that they are in their proper position and make sure that they do not block the drain hole in the pump body. Grease the shaft and carefully fit it into the body. Screw it through the sealing rings but make sure the rings are not damaged when doing so. Place the shaft so far into the housing that the bolt hole is outside: Fit the impeller and screw in the bolt. Then carefully push in the impeller until it bottoms. Place a new gasket on the cover and tighten up with the 6 bolts.

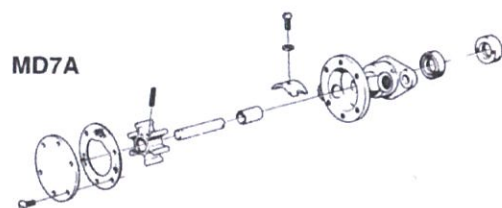
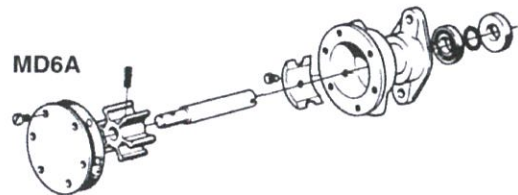


Fig. 83. Wiring diagram for late prod. Type MD6A

1. Key switch
2. Instrument panel switch
3. Temperature gauge
4. Warning light for "low oil pressure"
5. Rev counter
6. Warning light, charging start-generator
7. Switch, optional equipment
8. Terminal board
9. Warning light, charging alternator (Optional Equipment)
10. Battery
11. Main switch
12. Start-generator
13. Alternator (Optional Equipment)
14. Charging regulator
15. Fuse
16. Temperature sender
17. Rev counter
18. Oil pressure sender
19. Other electrical equipment

