

DIRECTORATE GENERAL BORDER ROADS

GENERAL REPAIR INSTRUCTION NO. 148
ON
COMMON DEFECTS AND ITS REMEDY OF
ENGINE (DIESEL) : P3, P4, P6 AND P6/305

1. **Aim**

1.1. P3, P4, P6 and P6 (305) diesel engines are fitted on a number of veh/eqpt/plant used by the Border Roads organisation. This instruction deals with fault diagnosis on P3, P4, P6, and P6 (305) diesel engine. When the eqpt reports on the defect, these instruction will assist the mechanics to repair/rectify in the defects with ease and speed.

2. **Action by**

2.1 Base/Fd Wksp (GREF) - Organise training of technical personnel to follow the correct sequence for envolving techniques to pin point defect by process of elimination. Record correct defects in repair cards and diagnose the exact cause for speedy repairs.

2.2 Project/Units - SO-I/SO-II Projects will organise training of all mechanics held on unit establishment centrally under the arrangements of Projects in the Field Wksp (GREF).

3. **Details**

3.1. Fault diagnosis chart are tabulated in Appendix 'A' to this instruction.

4. Please acknowledge receipt.

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FAULT DIAGNOSIS CHART

Fault	Possible cause
Low cranking speed	1,2,3,4.
Will not start	5,6,7,8,9,10,12,13,14,15,16,17,18,19,20,21,22,31,32,33.
Difficult Starting	5,7,8,9,10,11,12,13,14,15,16,18,19,20,21,22,24,29,31, 32,33.
Lack of power	8,9,10,11,12,13,14,18,19,20,21,22,23,24,25,26,27,31, 32,33.
Misfiring	8,9,10,12,13,14,16,18,19,20,25,26,28,29,30,32.
Excessive fuel consumption	11,13,14,16,18,19,20,22,23,24,25,27,28,29,31,32,33.
Black exhaust	11,13,14,15,16,18,19,20,22,24,27,28,29,31,32,33.
Blue/white exhaust	4,16,18,19,20,25,27,31,33,34,35,45.
Low oil pressure	4,36,37,38,39,40,42,43,44,56.
Knocking	9,14,16,18,19,22,26,28,29,31,33,35,36,45,46,57.
Erratic running	7,8,9,10,11,12,13,14,16,20,21,23,26,28,29,30,33,35, 45,57
Vibration	13,14,20,23,25,26,27,29,30,33,45,47,48.
High oil pressure	4,38,41.
Overheating	11,13,14,16,18,19,24,25,45,49,50,51,52,53,55.
Excessive crankcase pressure	25,31,33,34,45,54.
Poor compression	11,19,25,28,29,31,32,33,34,46,57.
Starts and stops	10,11,12.

KEY TO FAULT DIAGNOSIS CHART

1. Battery capacity low.
2. Bad electrical connections.
3. Faulty starter motor.
4. Incorrect grade of lubricating oil.
5. Low cranking speed.
6. Fuel tank empty.
7. Faulty stop control operation.
8. Blocked fuel feed pipe.
9. Faulty fuel lift pump.
10. Choked fuel filter.
11. Restriction in air cleaner.
12. Air in fuel system.
13. faulty fuel injection pump.
14. Faulty atomisers or incorrect type.
15. Incorrect use of cold start equipment.
16. Faulty cold starting equipment.
17. Broken fuel injection pump drive.
18. Incorrect fuel pump timing.
19. Incorrect valve timing.
20. Poor compression.
21. Blocked fuel tank vent.
22. Incorrect type or grade of fuel.
23. Sticking throttle or restricted movement.
24. Exhaust pipe restriction.
25. Cylinder head gasket leaking.
26. Overheating.
27. Cold running.
28. Incorrect tappet adjustment.
29. Stricking valves.
30. Incorrect high pressure pipes.

31. Worn cylinder bores.
32. Pitted valves and seats.
33. Broken, worn or sticking piston ring (s).
34. Worn valves stems and guides.
35. Overfilled air cleaner or use of incorrect grade of oil.
36. Worn or damaged bearings.
37. Insufficient oil in sump.
38. Inaccurate gauge.
39. Oil pump worn.
40. Pressure relief valve sticking open.
41. Pressure relief valve sticking closed.
42. Broken relief valve spring.
43. Faulty suction pipe.
44. Choked oil filter.
45. Piston seizure/pick up.
46. Incorrect piston height.
47. faulty engine mounting (Housing).
48. Incorrectly aligned flywheel housing or flywheel.
49. Faulty thermostat.
50. Restriction in water jacket.
51. Loose water pump drive belts.
52. engine oil cooler choked (if fitted).
53. Faulty water pump.
54. Choked breather pipe.
55. Coolant level too low..
56. Blocked sump strainer.
57. Broken valve spring.
