workshop manual for 4.2482, 4.248, T4.236, 4.236, 4.212 & T4.38 diesel engines

©
Perkins Engines Limited

Peterborough, England
1993

Publication No. 601 TPD 0393 1229

This publication supercedes the previous edition numbered 601 TPD 0682 1062.

This publication is written for world wide use. In territories where legal requirements govern engine smoke emission, noise, safety factors etc., then all instructions, data and dimensions given must be applied in such a way that, after servicing (preventive maintenance) or repairing the engine, it does not contravene the local regulations when in use.

Published by Technical Publications, Perkins Power Sales and Service Limited,
Peterborough England, PE1 5NA.

PREVIEW - YOUFIXTHIS.COM

CONTENTS

	Section
ENGINE PHOTOGRAPHS	A
TECHNICAL DATA	B
OPERATING AND MAINTENANCE	C*
FAULT DIAGNOSIS	D
CYLINDER HEAD MAINTENANCE	E
PISTONS AND CONNECTING RODS	F
CYLINDER BLOCK AND LINERS	G
CRANKSHAFT AND MAIN BEARINGS	H
BALANCER UNIT	J
TIMING CASE AND DRIVE	K
LUBRICATING SYSTEM	L
COOLING SYSTEM	M
AIR FILTERS AND FUEL SYSTEM	N
FLYWHEEL AND FLYWHEEL HOUSING	P
EXHAUSTER	Q
COMPRESSOR	R
ALTERNATOR, DYNAMO AND STARTER MOTOR	S
TURBOCHARGER	T
APPROVED SERVICE TOOLS	Appendix
INDEX	"
MARINE SUPPLEMENT	"

*Operating and maintenance information can be found in the multi-lingual 4.236 Series Users Handbook.

PREVIEW - YOUFIXTHIS.COM

SAFETY PRECAUTIONS



THESE SAFETY PRECAUTIONS ARE IMPORTANT. You must refer also to the local regulations in the country of use. Some items only apply to specific applications.

- Only use these engines in the type of application for which they have been designed.
- Do not change the specification of the engine.
- Do not smoke when you put fuel in the tank.
- Clean away fuel which has been spilt. Material which has been contaminated by fuel must be moved to a safe place.
- Do not put fuel in the tank while the engine runs (unless it is absolutely necessary).
- Do not clean, add lubricating oil, or adjust the engine while it runs (unless you have the correct training; even then extreme caution must be used to prevent injury).
- Do not make adjustments that you do not understand.
- Ensure that the engine does not run in a location where it can cause a concentration of toxic emissions.
- Other persons must be kept at a safe distance while the engine, or equipment, is in operation.
- Do not permit loose clothing or long hair near moving parts.
- Keep away from moving parts during engine operation. **Attention:** Some moving parts cannot be seen clearly while the engine runs.
- Do not operate the engine if a safety guard has been removed.
- Do not remove the filler cap of the cooling system while the engine is hot and while the coolant is under pressure, because dangerous hot coolant can be discharged.
- Do not use salt water or any other coolant which can cause corrosion in the closed coolant circuit.
- Do not allow sparks or fire near the batteries (especially when the batteries are on charge) because the gases from the electrolyte are highly flammable. The battery fluid is dangerous to the skin and especially to the eyes.
- Disconnect the battery terminals before a repair is made to the electrical system.
- Only one person must control the engine.
- Ensure that the engine is operated only from the control panel or from the operator's position.
- If your skin comes into contact with high-pressure fuel, obtain medical assistance immediately.
- Diesel fuel and lubricating oil (especially used lubricating oil) can damage the skin of certain persons. Protect your hands with gloves or a special solution to protect the skin.
- Do not wear clothing which is contaminated by lubricating oil. Do not put material which is contaminated with oil into the pockets.
- Discard used lubricating oil in a safe place to prevent contamination.
- Do not move mobile equipment if the brakes are not in good condition.
- Ensure that the control level of the transmission drive is in the "out-of-drive" position before the engine is started.
- Use extreme care if emergency repairs must be made at sea or in adverse conditions.
- The combustible material of some components of the engine (for example certain seals) can become extremely dangerous if it is burned. Never allow this burnt material to come into contact with the skin or with the eyes.
- Read and use the instructions relevant to asbestos joints given on this page.
- Fit only genuine Perkins parts.

Asbestos Joints



Some joints and gaskets contain compressed asbestos fibres in a rubber compound or in a metal outer cover. The "white" asbestos (Chrysotile) which is used is a safer type of asbestos and the risk of damage to health is extremely small.

The risk of asbestos from joints occurs at their edges or if a joint is damaged when a component is removed or if a joint is removed by abrasion.

To ensure that the risk is kept to a minimum, the procedures given below must be applied when an engine which has asbestos joints is dismantled or assembled.

- Work in an area with good ventilation.
- Do not smoke.
- Use a hand scraper to remove the joints – do not use a rotary wire brush.
- Ensure that the joint to be removed is wet with oil or water to contain loose particles.
- Spray all loose asbestos debris with water and put it in a closed container which can be sealed for safe disposal.

PREVIEW - YOUFIXTHIS.COM

Unified Threads and Engine No. Location

All threads used on the 4.2482, 4.248, T4.236, 4.236 and 4.212 Engines except perhaps on proprietary equipment are Unified Series, and American Pipe Series. Later engines use some metric threads.

Unified threads are not interchangeable with B.S.F. and although B.S.W. have the same number of threads per inch as Unified Coarse Series, interchanging is not recommended. due to a difference in thread form.

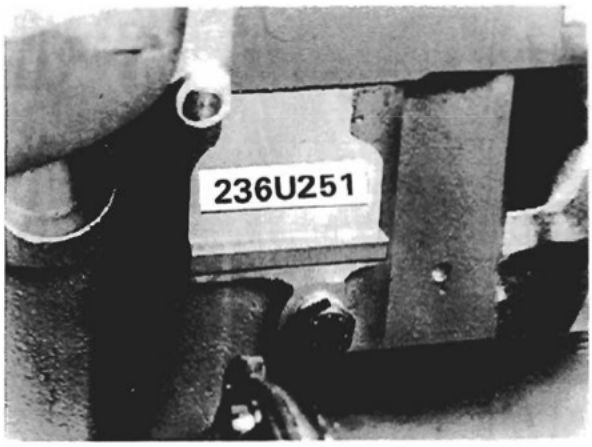
The Engine Number is stamped on the cylinder block as shown in the illustrations. The number position and composition have been changed at various times as detailed below.

Early 4.236 engines (Phase I Type) are stamped on a pad on the right hand side of the cylinder block above the rear end of the tappet cover. The number consists of 7 digits commencing with the figure '4'. Where a letter 'A' follows the engine number, the cylinder block is fitted with ½in diameter cylinder head studs.

Later 4.236 engines (Phase II Type) and earlier 4.248 and 4.212 engines are stamped on a pad on the right hand side of the cylinder block above the dynamo or alternator. The number consists of a combination of figures and letters, e.g. 248U251, 236U251 or 212U251. Other letters may be included in the combination, denoting specific information, e.g. a letter 'C' at the end of the number indicates that the engine is fitted with chrome plated cylinder liners.

Current engines numbers are stamped on a label which is fitted to the left hand side of the cylinder block above the fuel injection pump. Some engines also have the engine number stamped at the top of the rear face of the cylinder block. A typical number for this latest system is LD21498U510256D.

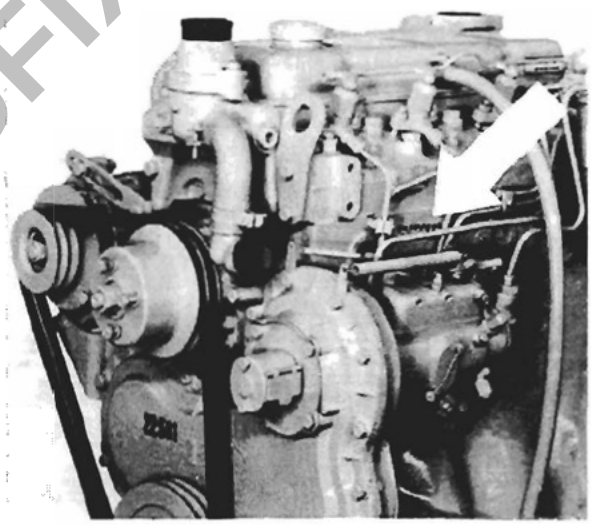
The engine number should be quoted in full and in the correct sequence, together with the type of vehicle or machine in which it is fitted, when requesting information or ordering parts.



Engine Number Location
(Earlier 4.248, Phase II 4.236 and 4.212 engines)



Engine Number Location
(4.236 Phase I Type)



Engine Number Location
(Current Engines)

PREVIEW ONLY FIXTHIS.COM

SECTION B
Technical data

Nominal Bore (4.2482 and 4.248)	3.975 in (100,96 mm)*
Nominal Bore (T4.236, 4.236 and 4.212)	3.875 in (98,43 mm)*
Stroke (4.2482, 4.248, T4.236 and 4.236)	5 in (127 mm)
Stroke (4.212)	4.5 in (114,3 mm)
No. of Cylinders	Four
Cubic Capacity (4.2482 and 4.248)	248 in³ (4,06 litres)
Cubic Capacity (T4.236 and 4.236)	236 in³ (3,86 litres)
Cubic Capacity (4.212)	212 in³ (3,47) litres)
Compression Ratio (4.2482)	18 : 1
Compression Ratio (4.236 and 4.248)	16 : 1
Compression Ratio (T4.236)	15.5 : 1
Compression Ratio (4.212 - HC Piston with 3 rings)	17.5 : 1
Compression Ratio (A4.212 - LC Piston with 4 rings)	15.5 : 1
Direction of Engine Rotation	Clockwise from the Front
Firing Order	1, 3, 4, 2
Cycle	Four-Stroke
Combustion System	Direct Injection
Lubricating Oil Pressure	Minimum 30 lbf/in² (2,1 kgf/cm²) 207 kN/m² at rated engine speed and normal working temperature. For T4.236 engines fitted with piston cooling jets, 37 lbf/in³ (2,6 kgf/cm³) 255 kN/m².

*Nominal —for actual bore size, see pages B.3 and B.4.

On A4.212 engines, the HC piston with 3 rings was fitted to MF engines from Nos. 212UA87001 to 212UA147672.

Details of Maximum Gross Ratings

4.2482 Engines

General	60 kW (80 bhp) at 2,600 rev/min
Maximum Torque	278 Nm (201 lbf ft) at 1,400 rev/min
Heavy Duty	54 kW (72.5 bhp) at 2,600 rev/min
Maximum Torque	238 Nm (176 lbf ft) at 1,400 rev/min

4.248 Engines

General Agricultural and Industrial	62 kW (84 bhp) at 2500 rev/min
Maximum Torque	263 Nm (194 lbf ft) at 1400 rev/min
Heavy Duty Agricultural and Industrial	59 kW (80 bhp) at 2200 rev/min
Maximum Torque	285 Nm (210 lbf ft) at 1400 rev/min

T4.236 Engines

General	76 kw (102 bhp) at 2,600 rev/min
Maximum Torque	340 Nm (250 lbf ft) at 1,600 rev/min
Heavy Duty	67 kW (90 bhp) at 2,500 rev/min
Maximum Torque	330 Nm (243 lbf ft) at 1,400 rev/min

T4.38 Engines

Vehicle	69,5 kW (93 bhp) at 2,600 rev/min
Maximum Torque	296 Nm (218 lbf ft) at 1600 rev/min

4.236 Engines

Vehicle	61 kW (82 bhp) at 2800 rev/min
Maximum Torque	256 Nm (194 lbf ft) at 1450 rev/min
General Agricultural and Industrial	60 kW (81 bhp at 2600 rev/min
Maximum Torque	267 Nm (197 lbf ft) at 1350 rev/min
Heavy Duty Agricultural and Industrial	54 kW (72 bhp) at 2200 rev/min
Maximum Torque	272 Nm (201 lbf ft) at 1400 rev/min

4.212 Engines

Agricultural	46 kW (62 bhp) at 2200 rev/min
Maximum Torque	229 Nm (169 lbf ft) at 1350 rev/min

All the above ratings are maximum and can vary according to application.
For details of individual ratings, apply to your nearest Perkins Distributor.

PREVIEW - YOUFIXTHIS.COM

Service Wear Limits (Continued)

Valve Head Thickness between run-out of valve seat and face of valve	1/32 in (0,79 mm)
Rocker Clearance on Rocker Shaft	0.005 in (0,13 mm)
Camshaft Journals—Ovality and Wear	0.002 in (0,05 mm)
Camshaft End Float	0.020 in (0,51 mm)
Idler Gear End Float	0.010 in (0,25 mm)
Valve Head Depth below Cylinder Head Face exhaust (Earlier)	0.055 in (1,40 mm) maximum
Valve Head Depth below Cylinder Head Face exhaust (Current)	0.073 in (1,85 mm) maximum
Valve Head Depth below Cylinder Head Face inlet	0.061 in (1,55 mm) maximum

MANUFACTURING DATA & DIMENSIONS

The following data of clearances and tolerances are given as a guide for personnel engaged upon major overhauls and the figures are those used in the factory for production purposes.

Cylinder Block

Total Height of Cylinder Block between Top and Bottom Faces	17.367/17.375 in (441,12/441,33 mm)
Parent Bore Dia. for Cylinder Liner (Chrome Thin Wall)	3.9625/3.9635 in (100,65/100,67 mm)
Parent Bore Dia. for Cylinder Liner (Chrome Thick Wall)	4.0625/4.0635 in (103,19/103,22 mm)
Parent Bore Dia. for Flangeless Cylinder Liner (Cast Iron)	4.0615/4.0625 in (103,16/103,19 mm)
Parent Bore Dia. for Flanged Cylinder Liner (Cast Iron) (T4.236, 4.236 and 4.212 earlier)	4.0625/4.0635 in (103,19/103,22 mm)
Parent Bore Dia. for Flanged Cylinder Liner (Cast Iron) (4.2482 and 4.248) and later, all engines*	4.1025/4.1035 in (104,20/104,23 mm)
Depth of Recess for Liner Flange (Cast Iron)	0.150/0.154 in (3,81/3,91 mm)
Depth of Recess for Liner Flange (Chrome Thin Wall) early type	0.046/0.049 in (1,17/1,25 mm)
Depth of Recess for Liner Flange (Chrome Thin Wall) later type	0.049/0.051 in (1,25/1,30 mm)
Depth of Recess for Liner Flange (Chrome) Thick Wall	0.150/0.152 in (3,81/3,86 mm)
Main Bearing Parent Bore Dia.	3.166/3.167 in (80,42/80,44 mm)
Camshaft Bore Dia. No. 1 for Bush (where fitted)	2.1875/2.1887 in (55,56/55,59 mm)
Camshaft Bearing Bush Internal Dia. fitted	2.0000/2.0017 in (50,8/50,84 mm)
Camshaft Bore Dia. No. 1	2.000/2.001 in (50,80/50,83 mm)
Camshaft Bore Dia. No. 2	1.990/1.9918 in (50,55/50,59 mm)
Camshaft Bore Dia. No. 3	1.970/1.9718 in (50,04/50,08 mm)

*All later cylinder blocks bored out to 4.1025/4.1035 in (104,20/104,23 mm) as standard.

Cylinder Liners Cast Iron
(4.2482, 4.248, T4.236, 4.236 and 4.212 engines)

Types	Dry—Interference Fit (Production) Dry-Transition Fit (Pre-finished Service)
Outside Dia. of Production Liner	
Flangeless — 4.248, 4.236 and 4.212 engines	4.0660/4.0670 in (103,27/103,30 mm)
Flanged — 4.2482 and 4.248 engines	4.1045/4.1055 in (104,25/104,28)
Flanged - T4.236, 4.236 and 4.212 engines (earlier)	4.0645/4.0655 in (103,24/103.26 mm)
Flanged - non-Flame Ring - all engines (later)	4.1045/4.1055 in (104,25/104,28 mm)
Outside Dia of Flanged Pre-Finished Service Liner	
4.2482 and 4.248 engines	4.1025/4.1035 in (104,20/104,23 mm)
4.236 and 4.212 engines	4.0625/4.0635 in (103,19/103,21 mm)
All Engines - non-Flame Ring	4.1025/4.1035 (104,20/104,23 mm)
Interference Fit of Production Liner in Cylinder Block	
Flangeless — 4.248, 4.236 and 4.212 engines	0.003/0.005 in (0,08/0,13 mm)
Flanged - Flame Ring 4.2482 and 4.248 engines	0.001/0.003 in (0,03/0,08 mm)
Flanged - Flame Ring T4.236, 4.236 and 4.212 engines	0.0007/0.002 in (0,02/0,07 mm)
Flanged - non-Flame Ring - All engines	0.001/0.003 in (0,03/0,38 mm)
Transition Fit of Pre-Finished Service Liner	±0.001 in (±0,03 mm)
Finished Bore Dia. of Production Liners	
4.2482 and 4.248 engines	3.9785/3.9795 in (101,05/101,07 mm)
T4.236, 4.236 and 4.212 engines	3.877/3.878 in (98,48/98,50 mm)

PREVIEW - YOUFIXTHIS.COM

Recommended Torque Tensions

The following figures will apply with the components lightly oiled before assembly.

All engines except T4.236 (hot or cold)	
Cylinder Head Nuts/Setscrews (1/2 in)	100 lbf ft (13,8 kgf m) – 136 Nm
Cylinder Head Nuts (7/16 in early 4.236 engines) ...	**60 lbf ft (8,3 kgf m) — 81 Nm**
Cylinder Head Nuts/Setscrews (1/2 in) (T4.236 cold) ...	100 lbf ft (13,8 kgf m) – 136 Nm
Cylinder Head Setscrews (1/2 in) with Integral Head Washer (cold)	88 lbf ft (11,8 kgf m) – 120 Nm
Connecting Rod Nuts* – Cadmium	70 lbf ft (9,7 kgf m) - 95 Nm
Connecting Rod Nuts* – Phosphated	90 lbf ft (12,4 kgf m) – 122 Nm
Connecting Rod Nuts†	
Cadmium Plated (silver finish)	75 lbf ft (10,4 kgf m) — 102 Nm
Phosphated (black finish)	95 lbf ft (13,2 kgf m) — 129 Nm
Main Bearing Setscrews**	150 lbf ft (20,7 kgf m) — 203 Nm
Main Bearing Setscrews††	180 lbf ft (24,9 kgf m) — 244 Nm
Idler Gear Hub Setscrews	30 lbf ft (4,1 kgf m) — 41 Nm
Fuel Injection Pump Gear Retaining Setscrews (3) ...	20 lbf ft (2,8 kgf m) - 27 Nm
D.P.S. Fuel Injection Pump Gear Retaining Nut	60 lbf ft (8,3 kgf m) - 81 Nm
Flywheel Setscrews	80 lbf ft (11 kgf m) — 108 Nm
Flywheel Place Bolts	90 lbf ft (12,4 kgf m) — 122 Nm
Flywheel Housing Setscrews 3/8 UNF (Standard) ...	36 lbf ft (5,0 kgf m) – 49 Nm
Flywheel Housing Setscrews 3/8 UNF (Durlock) ...	67 lbf ft (9,3 kgf m) – 91 Nm
Flywheel Housing Setscrews 3/8 UNF (4.2482 engines) ..	42 lbf ft (5,7 kgf m) – 57 Nm
Camshaft Gear Retaining Setscrews	50 lbf ft (6,9 kgf m) — 68 Nm
Crankshaft Pulley Retaining Setscrew (1) 1.67 in (42,4 mm) A/F	300 lbf ft (42 kgf m) — 406 Nm
Crankshaft Pulley Retaining Setscrew (1) 1.5 in (38,1 mm) A/F	
Cadmium Plated (silver finish)	240 lbf ft (33kgf m) — 325 Nm
Phosphated (black finish)	285 lbf ft (39 kgf m) — 390 Nm
Crankshaft Pulley Retaining Setscews (3)	70 lbf ft (9,7 kgf m) - 95 Nm
Lub. Oil Filter Setscrews/Nuts	30 lbf ft (4,2 kgf m) - 41 Nm
Atomiser Securing Nuts	14 lbf ft (1,9 kgf m) - 18 Nm
Atomiser Clamp Nuts	9 lbf ft (1,2 kgf m) – 12 Nm
Rockershaft Support Brackets (Aluminium)	30 lbf ft (4.1 kgf m) - 41 Nm
Rockershaft Support Brackets (Cast Iron)	54 lbf ft (7,4 kgf m) - 74 Nm
High Pressure Fuel Pipe Nuts	15 lbf ft (2,1 kgf m) — 20 Nm
Dynamo Pulley Retaining Nut	20 lbf ft (2,8 kgf m) — 27 Nm
Alternator Pulley Retaining Nut (7/16 in)	30 lbf ft (4,1 kgf m) — 41 Nm
Alternator Pulley Retaining Nut (7/16 in)	30 lbf ft (4,1 kgf m) — 41 Nm
Alternator Pulley Retaining Nut (1/2 in)	42 lbf ft (5,8 kgf m) — 57 Nm
Alternator Pulley Retaining Nut (M27)	44 lbf ft (6,1 kgf m) – 60 Nm
Balancer Retaining Setscrews	40 lbf ft (5,6 kgf m) – 50 Nm
Thermostart with Adaptor	10 lbf ft (1,4 kgf m) — 13 Nm
Piston Cooling valve assembly (T4.236)	20 lbf ft (2,8 kgf m) – 27 Nm

*For engines preceding the following Engine Nos:

212U901	236UA59562	236UH262
212UA140419	236UA1660A	236US16138
212UA4393A	236UC22005	248U9045
236U96087	236UE5408	248UA78127

**For engines preceding the following Engine Nos:

212U582	236UA50507	236US12129
212UA119095	236UC19949	248U6330
236U82408	236UE4404	248UA58746

†For engines commencing at the following Engine Nos:

212U901	236UA59562	236UH262
212UA140419	236UA1660A	236US16138
212UA4393A	236UC22005	248U9045
236U96087	236UE5408	248UA78127

††For engines commencing at the following Engine Nos:

212U582	236UA50507	236US12129
212UA119095	236UC19949	248U6330
236U82408	236UE4404	248UA58746

Note: The engine numbers shown above include a new engine number series which start LD, LF, LG, LM and LJ.

SERVICE WEAR LIMITS

The following "wear limits" indicate the condition when it is recommended that the respective items should be serviced or replaced.

Cylinder Head Bow		
	Transverse	0.003 in (0,08 mm)
	Longitudinal	0.006 in (0,15 mm)
Maximum Bore Wear (when reboring or new liners are necessary)		0.008 in (0,2 mm)
Crankshaft Main and Big End Journal Wear. Ovality .		0.0015 in (0,04 mm)
Maximum Crankshaft End Float		0.015 in (0,38 mm)
Valve Stem to Bore/Guide Clearance	inlet	0.005 in (0,13 mm)
	exhaust	0.006 in (0,15 mm)

PREVIEW - YOUFIXIT.COM

SECTION D
Fault Diagnosis

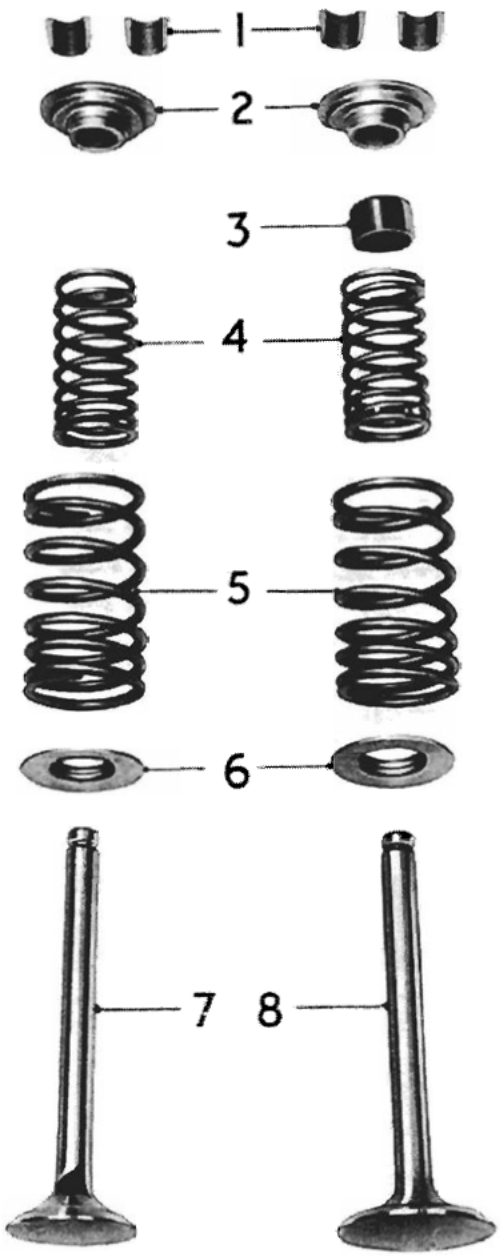
Fault Finding Chart

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, 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, 61, 63.
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, 63.
Black exhaust	11, 13, 14, 16, 18, 19, 20, 22, 24, 25, 27, 28, 29, 31, 32, 33, 61, 63.
Blue/white exhaust	4, 16, 18, 19, 20, 25, 27, 31, 33, 34, 35, 45, 56, 62.
Low oil pressure	4, 36, 37, 38, 39, 40, 42, 43, 44, 58.
Knocking	9, 14 16, 18, 19, 22, 26, 28, 29, 31, 33, 35, 36, 45, 46, 59.
Erratic running	7, 8, 9, 10, 11, 12, 13, 14, 16, 20, 21, 23, 26, 28, 29, 30, 33, 35, 45, 59.
Vibration	13, 14, 20, 23, 25, 26, 29, 30, 33, 45, 47, 48, 49.
High oil pressure	4, 38, 41.
Overheating	11, 13, 14, 16, 18, 19, 24, 25, 45, 50, 51, 52, 53, 54, 57.
Excessive crankcase pressure	25, 31, 33, 34, 45, 55, 60.
Poor compression	11, 19, 25, 28, 29, 31, 32, 33, 34, 46, 59.
Starts and stops	10, 11, 12.

Key to Fault Finding 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 or induction system.
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. Sticking 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 valve stems and guides.
35. Overfull 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. Damaged fan.
48. Faulty engine mounting (Housing).
49. Incorrect aligned flywheel housing, or flywheel.
50. Faulty thermostat.
51. Restriction in water jacket.
52. Loose fan belt.
53. Choked radiator.
54. Faulty water pump.
55. Choked breather pipe.
56. Damaged valve stem oil deflectors (if fitted).
57. Coolant level too low.
58. Blocked sump strainer.
59. Broken valve spring.
60. Fault in exhauster or vacuum pipe leaks.
61. Turbocharger impeller damaged or dirty.
62. Turbocharger lubricating oil seal leaks.
63. Induction system leaks (turbocharged engines).

PREVIEW - YOUFIXTHIS.COM



E3

1. Collets
2. Valve Spring Cap
3. Oil Deflector
4. Inner Valve Spring
5. Outer Valve Spring
6. Valve Spring Seat
7. Exhaust Valve
8. Inlet Valve

13. Remove cylinder head nuts/setscrews in reverse order of tightening sequence shown in Fig. E.12.
14. Remove cylinder head.

To Remove the Valves

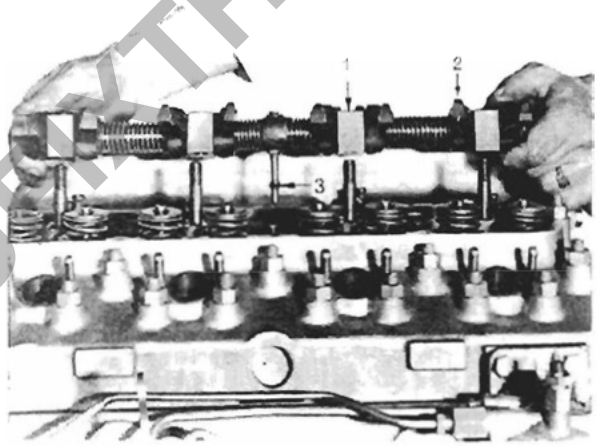
Mark all valves with a corresponding mark on the cylinder head to ensure that valves are refitted to their original positions unless replaced with new ones. Earlier engines had their valves and heads numbered during assembly as illustrated in Fig. E.6.

1. Compress spring caps and springs with a suitable valve spring compressor (Fig. E.5) and remove the two half conical collets from each valve.
2. Remove spring caps, springs and valve stem oil seals. Remove valves (Fig. E3).

NOTE: The quantity of springs, oil seals etc. fitted, and their location is dependent on application.

Cleaning

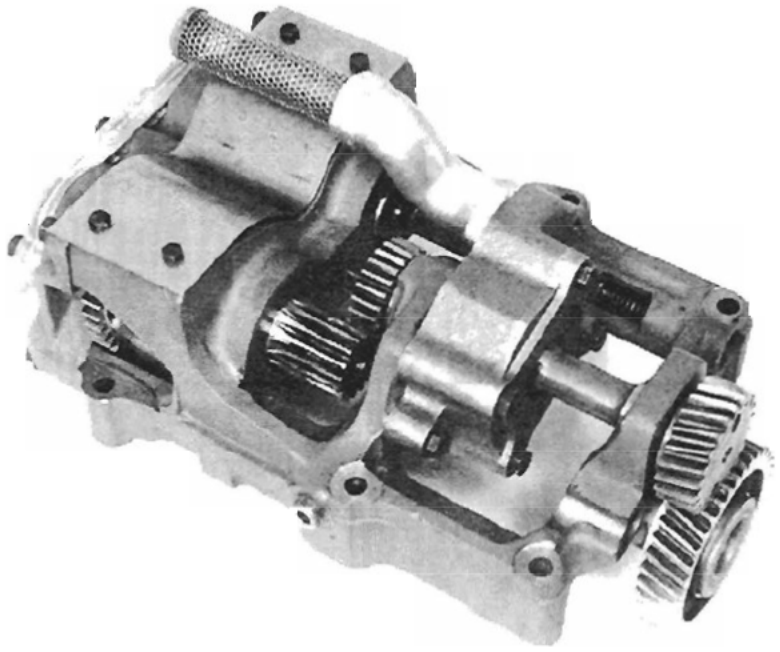
1. Remove all traces of carbon from cylinder head.
2. If the water jacket of the cylinder head shows signs of excessive scale, a proprietary brand of descaling solution should be used.
3. Blank off rocker oil feed oil-way between numbers 2 and 3 cylinders and remove carbon from pistons and cylinder block face.
4. After valve seat machining and valve grinding operations have been carried out, all parts should be thoroughly washed.



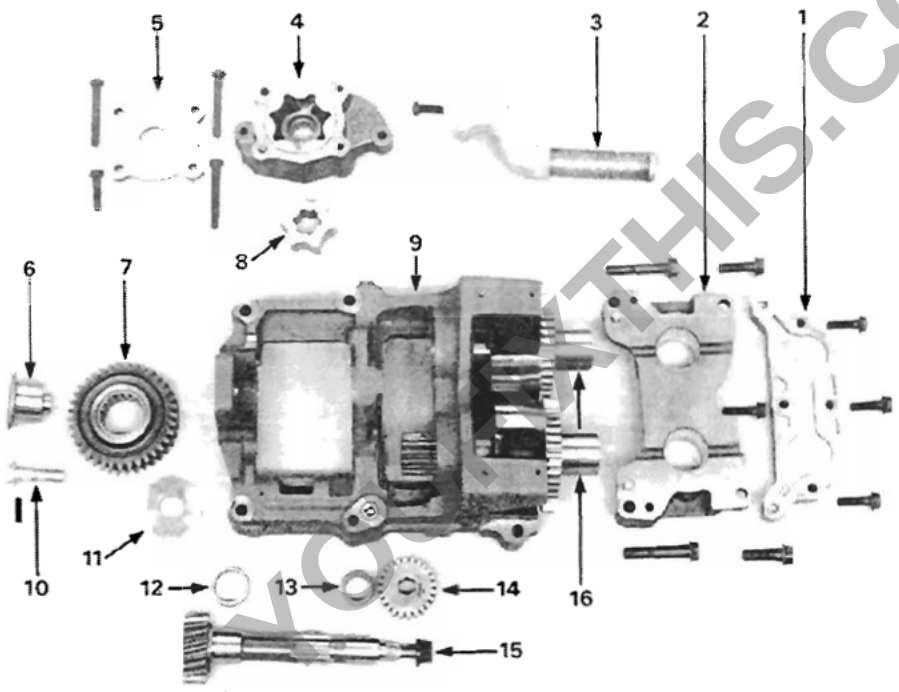
E4

1. Rocker Shaft Bracket
2. Rocker Lever
3. Oil Feed Connection

PREVIEW - YOUFIXTHIS.COM



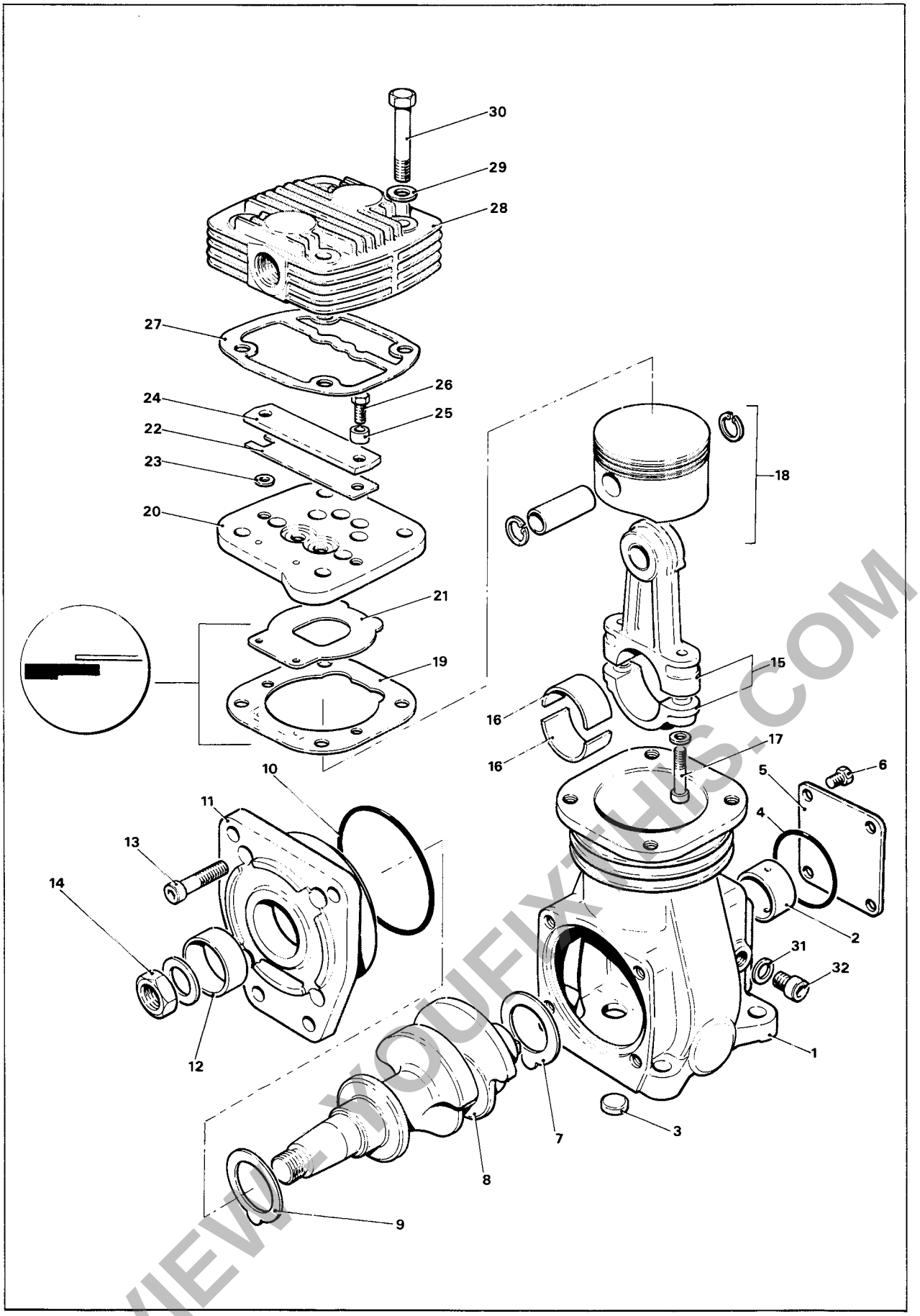
J13 Centre Mounted Balancer Unit Assembly



J14

1. Lubricating oil transfer plate.
2. Balancer frame and plate.
3. Lubricating oil suction pipe.
4. Lubricating oil pump.
5. Lubricating oil pump cover plate.
6. Idler gear hub.
7. Idler gear.
8. Lubricating oil pump impellor.
9. Balancer frame.
10. Idler gear hub setscrew.
11. Idler gear thrust plate.
12. Idler gear bearing.
13. Driveshaft needle roller bearings.
14. Balance weights gear.
15. Drive gear and shaft.
16. Balance weights.

PREVIEW - YOUR TEXT THIS.COM



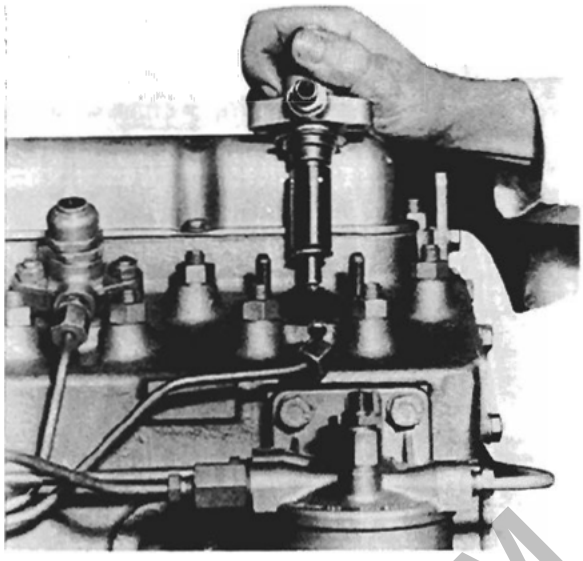
R4

PREVIEW - YOUFIXTHIS.COM

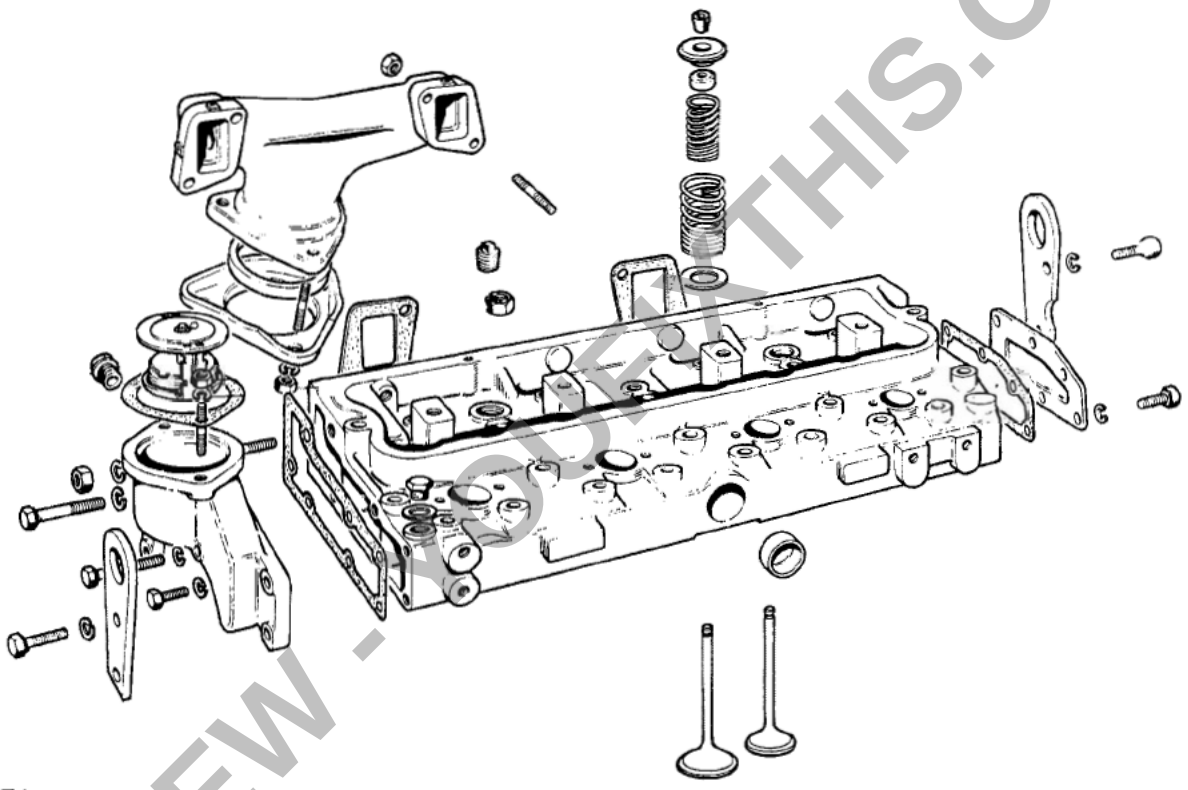
SECTION E
Cylinder Head Maintenance

To Remove the Cylinder Head

1. Drain the cooling system.
2. Disconnect battery terminals.
3. Detach the exhaust pipe. Remove turbocharger (T4.236 only).
4. Remove the atomiser leak-off pipe assembly.
5. Remove the fuel pipes from the fuel injection pump outlet and inlet to filter and boost control leak off pipe where fitted.
6. Disconnect fuel pipe from fuel lift pump outlet to fuel filter. Remove fuel filter.
7. Remove breather assembly.
8. Remove high pressure fuel pipes and atomisers (Fig. E.2).
9. Disconnect fuel pipe and/or electrical lead at the thermostat, and/or induction/port heaters, where fitted.
10. Remove air filter and/or connecting hose. Remove induction and exhaust manifolds.
11. Detach rocker cover.
12. Remove rocker assembly from cylinder head (Fig. E.4). Remove push rods.



E2



E1

PREVIEW - YOUR THIS.COM

PREVIEW ONLY

You're viewing 12 of 168 pages

The full manual includes:

- All 168 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Perkins 4.2482, 4.248, T4.236, 4.236, 4.212, T4.38, 4.236M, 4HD76, Range 4 M90, A4.248, A4.236, AT4.236 Workshop Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual