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Unit Standard 21688

Demonstrate knowledge of disassembling and reassembling a four stroke multi-cylinder engine

Level 2 Credit 3 v3

Student Name:	
School:	
Date:	

Marked By: _____ **Mark** _____%

Feedback: **Excellent work** ☐ **Please attempt all questions** ☐

Good work ☐ **Please resubmit** ☐

USEFUL WEBLINKS

Dealing with spills
http://youtu.be/NeH98Rx7dOE

Reduce, Reuse, Recycle
https://youtu.be/EWxjFLDoIDA
https://youtu.be/G1yBQv1hLRY

Power steering pump
https://youtu.be/US9tpbp_N28

Alternator removal
https://youtu.be/SM4LbGDCZn0

Starter motor removal
https://youtu.be/fwdtfOAwGcQ

Exhaust manifold removal
https://youtu.be/VBbE9D04m80

Turbocharger removal
https://youtu.be/8FQr5aeCU90

Intake manifold removal
https://youtu.be/SDYhA0i4P1g

Fuel rail/injector removal
https://youtu.be/tK5EAhpXcOc

Fuel tank removal
https://youtu.be/369co9HM1SU

Fuel pumps
https://youtu.be/IgxPjGC_cBw

Fuel filter
https://youtu.be/sDtQKNTz0QY

Ignition coils
https://youtu.be/3D90Fj1E8jI

Spark plug removal
https://youtu.be/0--K0_NUNKo

Distributor removal
https://youtu.be/u6b-vnsk5xA

Hydraulic pumps
https://youtu.be/bv4RNcbha2Q

REVIEW QUESTIONS ONE

Q1 Give three good housekeeping actions that should always be observed when dismantling an engine:

1.

2.

3.

Q2 The typical sequence for engine dismantling is:

Q3 List three safety points to consider when steam cleaning the engine bay.

Q4 Explain why it is important to drain oil while it is still hot.

Q5 Why is it important that the crankshaft is not moved until the head is removed once the cam belt has been taken off?

Q6 Outline the procedure involved in the removal of a timing belt from an over head cam engine.

Q7 Complete the following sentence.

Timing [ ] are generally [ ] by following the [ ] procedures as those used for the removal of a timing [ ]. However, the timing [ ] which may be [ ] controlled or [ ] loaded, will have [ ] removal procedures which will be outlined by the vehicle [ ].

Q8 Describe a possible cause of the lip that sometimes forms at the top of the cylinder bore?

Q9 When removing a piston assembly what precautions should be taken?

Q10 Describe the procedure that should be followed when removing a crankshaft from an engine block.

REVIEW QUESTIONS TWO

Q11 Explain why it is important to clean engine oil galleries, oilways and water jackets.

Q12 Outline five safety precautions that should be observed when using a parts wash machine.

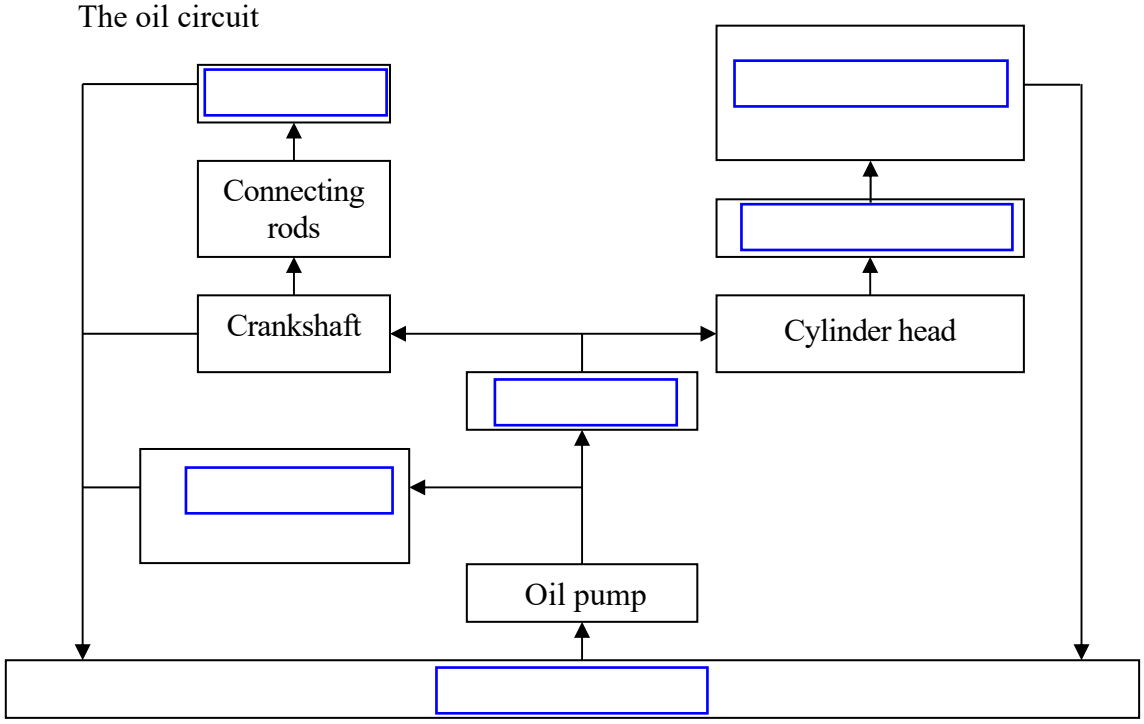
Q13 Explain why a bead blast cleaner is used by automotive technicians.

Q14 Name the three types of files that are commonly used in automotive workshops.

Q15 Outline a typical procedure involved in cleaning a cylinder head.

Q16 Complete the block diagram flow chart to show the oil flow from the sump to the engine components in a pressure oil circuit.

The oil circuit



Q17 Describe the purpose of the following oil system components.

Oil sump

Oil filter

Oil pump

Relief valve

Oil galleries

Q18 Describe how a rotary oil pump pressurises the oil.

Q19 Give two examples of where each of the following gasket material would be used.

Cork

Paper

Steel

Fibre

Q20 Name the three most common types of head gaskets?

Q21 Name the three requirements of head gaskets

Q22 Outline the procedure involved in preparing a sealing surface for the fitment of a gasket.

Q23 What is the difference between an Anaerobic Sealant and RTV?

REVIEW QUESTIONS THREE

Q24 Explain how cylinder head warpage can be measured.

Q25 Complete the following sentence.

Using a _____ gauge and an outside _____, measure each _____ guide in the cylinder _____ and compare the _____ with manufacturer's specifications. _____ valve guides will need to be replaced.

Q26 Why must the valves be stored in a numbered rack when they are removed from the cylinder head?

Q27 Explain why wear is greatest just below the ring ridge on a cylinder block.

Q28 Outline the procedure involved in measuring out of roundness using a bore gauge.

Q29 Sketch the outline of a cylinder block to show how the bore should be checked for distortion.

Taper **Out of roundness**

Q30 Explain where the micrometer should be positioned when measuring a piston.

Q31 What calculation should be carried out to determine piston to cylinder clearance?

Q32 Complete the following sentence.

Generally, if [ ] pin movement can be felt while [ ] the [ ] and the [ ] rod, the [ ] and/or the gudgeon [ ] may need to be replaced.

Q33 Outline the procedure involved in measuring a crankshaft journal for taper and out of roundness.

REVIEW QUESTIONS FOUR

Q34 What three actions must be carried out when fitting main bearing shells to the engine block?

Q35 (a) Describe how to check the piston ring end gap?

(b) What would the acceptable minimum gap for the rings on a piston of 88.9mm be?

Q36 Outline the procedure involved in installing compression rings.

Q37 Complete the following sentence.

Valve _____ refers to when and how _____ the valves _____. The _____ and _____ point for a valve is given as _____ before or after _____ dead centre _____ or before _____ dead centre _____.

Q38 Sketch a cylinder head that fits onto an engine block with 10 studs, to show the sequence that the cylinder head studs should be tightened?

Q39 Describe the procedure required to fit a timing belt onto an O.H.C. engine?

Q40 List four components that should be tightened with a torque wrench when assembling an engine.

Q41 Complete the following chart on the sequence of adjusting the valve clearance.

Cylinder Rocking	Valves adjusted on cylinder
No 1	
	No 3
No 3	
	No 1

Q42 Explain how the camshaft should be positioned into the cylinder head.

Q43 Explain why it is important to check and adjust if necessary valve clearances.

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