



NYPUNYAM
NATIONAL YOUTH PROMOTION

SKILL FIESTA 2016



KASE

KERALA ACADEMY FOR SKILLS EXCELLENCE
Skill Development Mission of Government of Kerala



NYPUNYAM

SKILLS FOR TOMORROW

February 5-7 | **2016**, Thiruvananthapuram, Kerala

AUTOMOBILE TECHNOLOGY

SKILL FIESTA - 2016

Test Project Format – State Level

Trade: Automobile Technology

Duration of the Test: **6 Hours**

Project Brief:

Disassemble the given petrol engine and inspect intake and exhaust camshaft, intake and exhaust valves, cylinder head, cylinder block, piston and crankshaft. Reassemble the engine by selecting the proper components and bearings also adjust valve clearance. Insure the healthy condition of engine by performing compression pressure test, vacuum test, oil pressure test and check if any DTC is there and take necessary steps to fix it.

Final Outcome expected from the candidate:

- Candidate will be able to operate productive equipments.
- Candidate will be able to understand manual and circuit diagrams.
- Candidates have good knowledge of special tool and measuring instruments.
- Candidate will be able to diagnose the technical problem in engines and will be able to rectify the problem in a qualitative manner.



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DESCRIPTION OF PROJECT / TASKS

The project needs an expert overhauling of a K-series petrol engine in healthy and safe manner.

Candidate has to disassemble the engine as per the guidelines given in the service manual. Candidate should inspect the following component on the given parameters.

- Intake and exhaust camshaft on the parameter of cam height, runout & journal clearance.
- Intake and exhaust valves on the parameter of valve stem dia, valve head radial runout & protrusion length.
- Cylinder head on the parameter of flatness from cylinder head gasket side, intake manifold side and exhaust manifold side.
- Cylinder block on the parameter of flatness from cylinder head gasket side.
- Cylinder bore on the parameter of diameter, taperness and ovality.
- Piston on the parameter of diameter and ring groove clearance.
- Crankshaft on the parameter of runout, thrust play, journal dia, main bearing clearance.

Reassemble the engine by selecting proper main journal bearing and big end bearing. Candidate should tight bolts in proper sequence and with proper torque.

After assembling the engine candidate should insure his quality work by performing compression test, oil pressure test and vacuum test on engine. Candidate should also check DTC to insure proper fitment of electrical harness of engine.

TECHNICAL DETAILS :

Sl. No.	Parameter	Standard value
1	Intake cam height	44.52 - 44.68 mm
2	Exhaust cam height	45.38 - 45.54 mm
3	Intake and exhaust camshaft runout	limit - 0.015 mm
4	Intake and exhaust camshaft journal clearance	0.04 - 0.08 mm
5	Intake valve stem dia	5.46 - 5.48 mm
6	Intake valve head radial runout	limit - 0.08 mm
7	Intake valve protrusion length	34.7 - 35.3 mm
8	Exhaust valves stem dia	5.44 - 5.45 mm
9	Exhaust valve head radial runout	limit - 0.08 mm
10	Exhaust valves protrusion length	34.6 - 35.2 mm
11	Cylinder head flatness (head gasket side)	limit - 0.03 mm
12	Cylinder head flatness (Intake and exhaust side)	limit - 0.05 mm
13	Cylinder block flatness (head gasket side)	limit - 0.03 mm
14	Cylinder bore dia	73.00 - 73.01 mm
15	Cylinder bore taperness	limit - 0.01 mm
16	Cylinder bore ovality	limit - 0.01 mm
17	piston diameter	73.00 - 73.01 mm
18	piston 1st ring groove	0.15 - 0.27 mm
19	piston 2nd ring groove	0.28 - 0.41 mm
20	piston oil ring groove	0.20 - 0.50 mm
21	Crankshaft runout	limit - 0.02 mm
22	Crankshaft thrust play	0.11 - 0.31 mm
23	Crankshaft journal dia	45.00 - 45.01 mm
24	Crankshaft main bearing clearance	0.016 - 0.034 mm
25	Connecting rod bearing clearing	0.031 - 0.049 mm
26	Crankshaft pulley bolt torque	150 Nm
27	main bearing cap bolts torque	19 Nm→ 40 Nm→ +60°
28	cylinder head bolts torque	20 Nm→ 40 Nm→ +60°→ +60°
29	camshaft housing bolts torque	5 Nm→ 8 Nm→ 11 Nm
30	timing chain cover bolts torque	25 Nm
31	Intake valve clearance	0.14 - 0.23 mm
32	Exhaust valve clearance	0.30 - 0.40 mm
33	cylinder head cover bolts torque	5 Nm→ 8 Nm→ 11 Nm
34	compression pressure of cylinder	1200 KPa
35	oil pressure of engine	300 - 500 KPa



NYPUNYAM
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SKILL FIESTA 2016



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vacuum in intake manifold

34 KPa

INSTRUCTIONS TO THE COMPETITOR:

- Candidate should perform each and every task with proper PPE.
- Candidate should report on given time at test centre.
- Candidate will not get any addition time for completing the task.
- Candidate can ask for any special tool if required.
- Candidates are not allowed to use any kind of unfair means during the test.
- Candidates must follow the instruction given by examiner.
- No electronic devices like mobile, calculator permitted.
- Make sure all tools available are in proper condition before starting test.
- Candidates must be careful while handling tools and machines.
- Handel the fluids carefully like engine oil, coolant etc.

MARKING SCHEME : OUT OF 100

State Level test				
S. No.	Category	Parameter	Marks	Total
1	Personal, Tools and equipment safety	Use of gloves by candidate	2.5	10
		Use of Shoes by candidate	2.5	
		Use of apron/dress by candidate	2.5	
		Tools Handling	2.5	
2	Initialization	Selection of tools	5	10
		Collections of necessary equipment	5	
3	Solution of technical problem	Opening cylinder head cover bolts in proper sequence	1.5	70
		Use of special tool to lock crankshaft	1.5	
		Opening of timing chain cover bolts in proper sequence	1.5	
		Opening of camshaft housing bolts in proper sequence	1.5	
		Opening of cylinder head bolts in proper sequence	1.5	
		Opening of main bearing cap bolts in proper sequence	1.5	
		Proper inspection of camshaft (cam height, runout, journal clearance)	1.5	
		Proper inspection of valves (valve stem dia, valve head radial runout, protrusion length)	1.5	
		Proper inspection of cylinder head (flatness)	1.5	
		Proper inspection of cylinder block (flatness, cylinder bore dia, taperness, ovality)	1.5	
		Proper inspection of piston (dia of piston, ring groove clearance)	1.5	
		Proper inspection of crankshaft (runout, thrust play ,journal dia, main bearing clearance)	1.5	
		Proper selection of main bearing	3	
		Proper selection of connecting rod bearing	3	
		Tightening main bearing cap bolts in proper sequence and torque	1.5	
		Tightening cylinder head bolts & crankshaft pulley bolt in proper sequence and torque	1.5	
		Tightening camshaft bolts in proper sequence and torque	1.5	
Tightening timing chain cover bolts in proper sequence and torque	1.5			
checking valve clearance	5			
Tightening cylinder head cover bolts in proper sequence and torque	5			



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		Performing and diagnosing result from compression pressure test	8	
		Performing and diagnosing result from oil pressure test	8	
		Performing and diagnosing result from vacuum test	7	
		Performing and diagnosing result from DTC check	7	
4	Housekeeping	Putting tools & equipment back on right place	10	10
			Total	100