

NATIONAL SKILLS COMPETITION
Test Project - Automotive Technology
April 23 to 25, 2008

National Skills Competition Final Test Project – Automotive Technology

April 23 to 25, 2008



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WorldSkills Jamaica Competition April 24 to 25, 2008

General Instructions

1. Each competitor will be required to carry out the test project as specified and will be available on the website three months before the competition.
www.worldskillsjamaica.org
2. Each competitor will be required to carry out the test project as specified on the schedule to be handed out two days before the competition.
3. The time will be specified according to the test project.
4. 20% change will be made to the test project on the day of the competition where a new test project will be issued to the competitor.
5. All materials, ingredients, large equipment and specialized hand tools will be provided.
- 6. Please note that all competitors should provide their own small tools and utensils.**
7. Competitors are expected to identify all equipment/ materials/ingredients needed and submit list to the competitions committee no later than March 7, 2008.
8. Debriefings will also be conducted for all competitors on April 22, 2008.
9. All competitors will get an opportunity to arrange work areas the day before the competition. Where applicable competitors for the second day will arrange their work areas on the evening of day one. Competitors who fall in the second shift will get an opportunity to do their preparation at offsite locations (to be decided) where necessary.
- 10. Competitors and coaches are expected to find their way to the competition village on April 22, 2008 and to depart back home on April 26, 2008**

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- 11. Transportation will be provided at designated times for all competitors and coaches to and from the competition venue.**
- 12. All coaches will play the role of experts (judges) for the competition**
- 13. Accommodation and meals will be provided for all competitors**
- 14. Accommodation will be provided for coaches only.**
- 15. All other persons that support the competitors will need to make their own accommodation arrangements.**
- 16. Lunch and light refreshment only will be provided for coaches, (experts), workshop supervisors, national trade managers and volunteers.**

17. All competitors should be present for the opening ceremony along with their coaches.
18. Rehearsal for the opening ceremony will be held on the evening of April 22, 2008 in the Indoor Sports Centre.
19. Competitors are not allowed out of the competition village unless permission is granted by the dorm master.
20. All competitors are required to register at the competition village to qualify for entry into the competition.
21. Special permission must be granted if competitors need to reside off campus.

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AUTOMOTIVE TECHNOLOGY

Duration: 6 hours

Each person will participate in four tasks making up the project as outlined below

Electrical Systems – Task 1

- Vehicle Electrical (Use of the Multi-meter)
- With the use of diagram find and correct fault in one light system indicated.
- Head light
- Park light
- Brake light
- Indicator light

Steering and Suspension – Task 2

- Changing tyre on car rim then Balance wheel.

Engine Tune-up- Task 3

- Time an engine's camshaft to an engine's crankshaft and start engine

Braking Systems- Task 4

- Assemble and disassemble of Brake shoe assembly

VEHICLE ELECTRICAL (WIRING LIGHTING CIRCUIT) - Task 1

Each person will given the equipment/tools required to complete the activity successfully.

They will be required to

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- Use a wiring diagram to trace electrical circuit
- Use a multimeter to locate the fault
- Correct the fault using available resource.
 - Head light
 - Park light
 - Brake light
 - Indicator light

The task should be completed in **thirty (30)** minutes)

Each person will be judged on the following:

- Correct functioning of all lights on motor car
- Functionality of each circuit; i.e. Park light, headlight, brake light, indicator light.
- Time
- Housekeeping
- Safety
- Technical competence

TYRE CHANGING- Task 2A

Each person will be given all the necessary tools, equipment and materials to complete the task.

They will be required to:

- Remove valve plunger and release air.

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- Break tyre seals around rim using equipment available.
- Place wheel on machine.
- Remove tyre from rim.
- Clean rim and prepare for tyre replacement
- Fit tyre on rim
- Pump up tyre to air pressure specification
- Remove tire from equipment.

WHEEL BALANCING- Task 2B

Each person will be given all the necessary tools, equipment and materials to complete the task.

They will be required to:

- Check for correct tire pressure
- Remove the counter weight using weight pliers
- Prepare tyre to be balanced
- Select the adapter of the machine that corresponds with the wheel
- Mount the wheel onto the machine
- Fix wheel to the machine
- Set controls to manufactures specification
- Start machine and take reading of the counter weight and locate the position where it is going to be fitted
- Select the weight indicated by the machine
- Place weight on wheel at the location indicated
- Check the dynamic balancing by repeating step 7
- After wheel is balanced remove it from the machine

Each person will be judged on the following:

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- Time **(30 minutes)**
- Using of correct counterweight
- Obtaining correct specification
- Taking correct reading of counterweight
- Correct balancing of wheel
- Safety
- Housekeeping

TIME AN ENGINE'S CAMSHAFT TO AN ENGINE'S CRANKSHAFT – Task 3

Each person will be given all the necessary tools, equipment and materials to complete the task.

They will be required to:

- Align Camshaft and Crankshaft
- Remove timing belt
- Fit timing belt/Chain
- Adjust belt tension
- Check belt timing
- Start Engine

Each person will be judged on the following:

- Use of Time **(1 hr)**
- Accuracy of timing
- Safety
- Housekeeping
- Engine been able to start successfully

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ASSEMBLE AND DIS-ASSEMBLE DRUM BRAKE – task 4

Each person will be given all the necessary tools, equipment and materials to complete the task.

They will be required to:

BRAKE SHOE ASSEMBLY

- Disassemble brake shoe
- Inspect and prepare brake shoe and drum for replacements
- Replace Brake shoe

Each person will be judged on the following:

- Time **(30minutes)**
- Preparation of brake shoe and drum
- Team work as required
- Safety
- Housekeeping

Competition Rating

Item Rating	Area	Maximum Points
1.	Electrical Systems	20
2.	Braking Systems	20
3.	Steering and Suspension	20
4.	Petrol Engine Tune-up	20

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TOOL LISTING

- 1 set of flat-bladed screwdrivers (4 pieces min.)
- 1 set of pozi-drive screwdrivers (4 pieces min.)
- 1 set of Allen (hex, inbus) key 1.5 to 10mm
- 1 set of torx drivers internal ranging from size 8 to 40
- 1 set of torx drivers external ranging from 8 to 40
- 1 set open ended spanners 6 to 22mm
- 1 set of ring spanners (box) 6 to 22mm
- 1-water pump (pipe) pliers
- 1 side cutter
- 1 long nosed pliers
- 1-combination pliers
- 1 vice grip
- 1 scribe
- 1 measuring tape 2m
- 1 metal ruler (300mm)
- 1 torch lamp (flashlight)
- 1 vernier caliper gauge, internal, external and depth gauge (accuracy 0.02mm)
- 1 micrometer (palmer) 0 – 25mm (0 – 1 inch)
- 1 multimeter, high impedance, V, A (10A), Ohms
- 1 feeler gauge set (0.05mm/0.02inch increments up to 2.00mm/0.08inch)
- 1 test lamp 12v
- 1 test lamp (LED type)
- 1 socket set 6 to 22mm – drive 3/8 in
- 1 socket set 4 to 13mm – drive 1/2in
- 1 torque – wrench(s) range 20 to 100Nm

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- 1 hammer 300g and torque angle adapter
- 1 soft headed hammer (mallet)
- 1 parallel drift punch set (diameter 2 to 8 mm)
- 1 magnetic pick up tool

EQUIPMENT

- Air Compressor
- Tyre Balancing Machine and tyre changing machine
- G Clamp/piston return tool
- Head light beam adjuster/setter
- Motor Vehicle with functional engine and brakes
- Timing light (stroboscopic)

SAFETY REQUIREMENTS

Each student must provide the following:

- Over coat or Cover all
- Safety boot
- Goggles where necessary

Usage of tools and equipment is very important where safety is concern hence safety must be adhere to

Safety is of utmost importance as a result trainees should adhere to:

- The correct usage of tools.
- The correct usage of equipment.
- The correct usage of materials.
- A clean environment.

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**OBJECTIVE MARKING
FORM 5**

World SKILLS JAMAICA 2008
Skill Area: Automotive Technology

Competitor # _____
Task – Adjusting/Aiming Head light

Criterion #	Aspect of Criterion Description	Mark allotted for objective marking	Total Mark received for objective Marking	Total Mark received for Subjective Marking	Overall Mark Awarded
	Aim Beam setter parallel to headlights (10"INCHES)	10			
	Focus beam setter using the mirror	20			
	Set scale to distance from light	20			
	Adjust headlights to specification	40			
	Secure equipment and clean up tools and work area	10			

Total Mark awarded _____

Signatures

Judge 1

Judge 2

Judge 3

Judge 4

<u>Chief Judge</u>
<i>Date</i>

CIS scoring
All competitors will be scored using the Computer Information System (CIS) – (400 to 600 possible points)

500 – Medallion of excellence

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Top three scores will receive gold, then silver, then bronze

OBJECTIVE MARKING
FORM 5
World SKILLS JAMAICA 2008

Skill Area: Automotive Technology

Competitor ID _____
Task 2A- Change Tyre

Criterion #	Aspect of Criterion Description	Mark allotted for objective marking	Total Mark received for objective Marking	Total Mark received for Subjective Marking	Overall Mark Awarded
	Deflate Tyre				
	Remove valve plunger using core tool	5			
	Remove weights using weight pliers	10			
	Break tyre bead from rim flange	10			
	Mount and secure tyre machine	10			
	Remove tyre from rim and inspect	5			
	Lubricate bead using rubber lubricant	20			
	Refit tyre and remove from machine	20			
	Inflate the tyre	10			
	Replace plunger	5			
	Clean up tools and area	5			

Total Mark awarded _____ Signatures

Judge 1	Judge 2	Judge 3	Judge 4

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Chief Judge
Date

OBJECTIVE MARKING
FORM 5
World SKILLS JAMAICA 2008

Skill Area: Automotive Technology

Competitor ID _____

Task 3- Set Engine Timing

Criterion #	Aspect of Criterion Description	Mark allotted for objective marking	Total Mark received for objective Marking	Total Mark received for Subjective Marking	Overall Mark Awarded
	Remove timing belt and inspect	30			
	Align camshaft and crankshaft	20			
	Fit timing belt/chain	10			
	Adjust belt tension	25			
	Check belt timing	5			
	Clean up tools and work area	10			

Total Mark awarded _____ **Signatures**

Judge 1	Judge 2	Judge 3	Judge 4

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CHIEF JUDGE
Date

OBJECTIVE MARKING

FORM 5
World SKILLS JAMAICA 2008

Skill Area: Automotive Technology

Competitor ID _____

Task 4 – Change Disc Pads

Criterion #	Aspect of Criterion Description	Mark allotted for objective marking	Total Mark received for objective Marking	Total Mark received for Subjective Marking	Overall Mark Awarded
	Remove wheel	10			
	Remove disc pads	20			
	Inspect and prepare disc and rotor for replacements	35			
	Replace disc pads	25			
	Replace wheel	10			
	Clean up tools and work area	10			

Total Mark awarded _____ **Signatures**

Judge 1	Judge 2	Judge 3	Judge 4

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CHIEF JUDGE
Date

OBJECTIVE MARKING

FORM 5
World SKILLS JAMAICA 2008

Skill Area: Automotive Technology

Competitor # _____

Task – Vehicle Electrical
Use of multi-meter

Criterion #	Aspect of Criterion Description	Mark allotted for objective marking	Total Mark received for objective Marking	Total Mark received for Subjective Marking	Overall Mark Awarded
	Using multi-meter, select 20V scale above 12VDC	10			
	Measure voltage in the turn signal circuit	20			
	Select electrical resistance scale	10			
	Measure the resistance in the turn-signal circuit	20			
	Select electrical current scale	10			
	Measure current flow in the turn-signal circuit	20			
	Clean up equipment and work area	10			

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Total Mark awarded _____ Signatures

Judge 1	Judge 2	Judge 3	Judge 4
Chief Judge			
<i>Date</i>			

SUBJECTIVE MARKING
FORM 5A
World SKILLS JAMAICA 2008

Skill Area: Automotive Technology

Competitor # _____

Criterion #	Aspect of Criterion - Description	Judge score (Out of 10)					Mark Awarded
		1	2	3	4	5	
1	Preparation						
2	Selection of Tools						
3	Use of Tools						
4	Job Knowledge						
5	Material Usage						
6	House Keeping						
7	Safety						
8	Presentation						
9	Creativity/ Innovation						
10	Originality						

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Formula for Subjective marking total score:

Exclude the highest and the lowest score and find the average of the remaining three.

Total Mark awarded _____ Signatures

Judge 1	Judge 2	Judge 3	Judge 4

CHIEF JUDGE
<i>Date</i>

Score for subjective marking should be entered on form 5 for total score.

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Competitor # _____

Criterion #	Aspect of Criterion Description	Mark allotted for objective marking	Total Mark received for objective Marking	Total Mark received for Subjective Marking	Overall Mark Awarded

Total Mark awarded _____ Signatures

Judge 1	Judge 2	Judge 3	Judge 4
Chief Judge			
<i>Date</i>			

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