



world**skills**
New Zealand

2010 NATIONAL COMPETITION

Automotive Technology

**Pre-Competition Information
for Competitors**

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INTRODUCTION

Congratulations on qualifying for a WorldSkills New Zealand national competition. The pathway to success includes a careful study of these instructions. **Please read these instructions fully and retain them for the competition days.**

As a participant in this WorldSkills New Zealand competition you will receive a ranking against your peers, according to the skills you demonstrate on the day. You are judged according to your ability to achieve set goals and are awarded marks according to how well you achieve those goals. Unlike standard competency assessments, if you perform better than the industry standard demands [the minimum mark], then you will be rewarded for that effort.

The project designed for the WorldSkills NZ National Competition involves vehicles and equipment normally less than five years old. The vehicles and equipment selected are commonly used in New Zealand. Specific makes and models of vehicles cannot be specified due to actual vehicles often not being known until only a number of weeks (or days) prior to the competition.

All sections have been designed using standard automotive industry knowledge, skills and competency's.

Please consult the project designer if you require any explanations.

The Marking Summary and Section Overviews are as follows:

Marking Summary

| | | |
|----|-------------------------|-----|
| 1. | Petrol Engine Systems | 15% |
| 2. | Steering and Suspension | 14% |
| 3. | Braking Systems | 15% |
| 4. | Manual Transmissions | 14% |
| 5. | Electrical Systems | 14% |
| 6. | Diesel Engine Systems | 14% |
| 7. | Engine Mechanical | 14% |

All modules allow for a fifteen minute familiarisation period prior to undertaking the task. The time allowed for each task is two hours and thirty minutes. This gives a total of two hours and forty five minutes for each module.

Module 1 – Petrol Engine Systems 2 hours 30 minutes duration

Task

You will be required to check, test, diagnose and repair a vehicles petrol engine management and associated systems. Some faults will have been induced into the system and you will also be asked to test certain specific components and functions.

Requested Vehicle Description

6 Cylinders, Engine Management System and Waste Spark Ignition System.

Specific Equipment

Engine Analyser with 4 or 5 Gas Analyser and Lab Scope.

Module 2 – Steering and Suspension 2 hours 30 minutes duration

Task

You will be required to replace steering components, perform a wheel alignment, test and repair hydraulic steering systems.

Requested Vehicle Description

Vehicle with 4 wheel adjustable steering geometry.

Vehicle with hydraulic power steering assistance.

Specific Equipment

Electronic 4 Head Wheel Aligner

Module 3 – Braking Systems 2 hours 30 minutes duration

Task

You will be required to perform checks and repairs on a hydraulic brake system and an electronically controlled Anti Lock braking system.

Requested Vehicle Description

Vehicle with 4 wheel discs and ABS

Module 4 – Manual Transmission 2 hours 30 minutes duration

Task

You will be required to disassemble, inspect, assess and repair a 5 speed manual transmission.

You will be required to replace a universal joint.

Requested Equipment

5 Speed manual transmission on stand or suitable workbench.

Drive shaft assembly with universal joints joints

Module 5 – Electrical Systems 2 hours 30 minutes duration

Task

You will be required to check, test, diagnose and repair standard electrical systems fitted to a vehicle and connect conventional after market accessories to a vehicle.

Requested Vehicle Description

Vehicle with accessible alternator

Lighting test bench

4 x Auxiliary lamps

Fuses, fuse holders, relays, connectors and relays.

Module 6 – Diesel Engine Systems 2 hours 30 minutes duration

Task

You will be required to check, test, diagnose and repair a vehicles diesel fuel system and starting aid system.

Requested Vehicle Description

4 Cylinder vehicle with common rail injection (2 x Toyota Prado's)

Specific Equipment

Scan tool post tester

Module 7 – Engine Mechanical

2 hours 30 minutes duration

Task

You will be required to perform engine dismantling, component replacement, engine measurement and assembly.

Requested Equipment

Complete 4 cylinder DOHC engine.

Competition Schedule

The maximum working time for this competition is 22 hours. As a competitor you should keep track of time yourself, although timings will be centrally controlled and regular time-checks given. The timetable for the competition days is shown below.

Day of Arrival (Wednesday 22 September)

| | |
|---|--|
| 3:00pm – 5:00pm (1500 – 1700hrs) | Site familiarisation. Draw for work stations and instructions, tool kits, etc |
| 5:00pm (1700hrs) | Opening Ceremony |
| 6:30pm (1800 hrs) | Dinner |

Day 1 (Thursday 23 September)

| | |
|----------------|---|
| 9 am (0900) | Site familiarisation and briefing. |
| 9:30am (0930) | Task and equipment familiarisation |
| 10:00am (1000) | Competition project (Morning tea break of 15 minutes at judge's discretion and control) |
| 1pm (1300) | Lunch |
| 2:00pm (1400) | Competition project (Afternoon tea break of 15 minutes at judge's discretion and control) |
| 5:00pm (1700) | tidy up and secure work area. |

Day 2 (Friday 24 September)

| | |
|----------------|---|
| 8:00am (0800) | Competition Project (Morning tea break of 15 minutes at judge's discretion and control) |
| 12:30pm (1230) | Lunch |
| 1:00pm (1300) | Competition project (Afternoon tea break of 15 minutes at judge's discretion and control) |
| 5:00pm (1700) | Tidy up and secure work area. |

Day 3 (Saturday 25 September)

| | |
|----------------------|---|
| 8.30am (0830) | Competition Project (Morning tea break of 15 minutes at judge's discretion and control) |
| 12:00 noon (1230) | Lunch |
| 1:00pm (1300) | Competition project (Afternoon tea break of 15 minutes at judge's discretion and control) |
| 3:00pm (1500) | Tidy up and secure work area. |

Day 4 (Sunday 26 September)

| | |
|-------------|-------------------------------|
| | Clean up at CPIT if necessary |
| 11am (1100) | Awards Ceremony |

Marking Scale Summary

All competitors who compete in this skill category will be judged according to the same criteria. A summary of the different project sections and the number of marks allocated to each section is shown below.

Description of Marking Systems

The following marking systems will be used by the Judges in their assessment of your project.

Objective Marking

Judges will carry out **objective marking** in all areas of the project. **No partial marks will be awarded!**

EQUIPMENT TO BE SUPPLIED BY THE COMPETITOR

Competitors are responsible for their own tools. It should be noted that all power tools and machinery must comply with OSH regulations and have adequate safety guards and be in what is deemed to be safe operating condition. At the discretion of the officials any suspect piece of equipment may be prevented from being used. Competitors should supply the information listed below.

It is necessary for you to have a tool kit that will allow you to carry out the projects designed for this competition.

Description & Quantity

| | |
|--|---|
| Tool box with a lock | 1 |
| Socket set $\frac{1}{2}$ " & $\frac{3}{8}$ " square drive | 1 |
| Metric and AF/SAE; complete with a range of bars, handles, ratchet and universal joint, Metric 4mm–30mm; | 1 |
| AF/SAE $\frac{3}{8}$ " – $1\frac{1}{8}$ "; & spark plug sockets | 1 |
| Set of open end spanners; Metric 6mm – 27mm, AF/SAE $\frac{1}{4}$ " – $1\frac{1}{8}$ " | 1 |
| Set of ring/open end spanners, Metric 6mm – 27mm, AF/SAE $\frac{1}{4}$ " – $1\frac{1}{8}$ " | 1 |
| Common blade screwdrivers; (–) different sizes | 4 |
| Phillips blade screwdrivers; (+) different sizes | 3 |
| Pair pliers; 8" combination | 1 |
| Pair pliers; 7" long nose | 1 |
| Pair pliers; 8" diagonal cut | 1 |
| Pair multigrips; 10" | 1 |
| Ball pein hammer; 0.5kg | 1 |
| Tension wrench; imperial/metric (essential) $\frac{1}{2}$ inch square drive | 1 |
| Tension wrench; imperial/metric (essential) $\frac{3}{8}$ inch square drive | 1 |
| Vernier caliper | 1 |
| Soft faced hammer | 1 |
| Centre punch | 1 |
| Brass drift; 150mm x 10mm | 1 |
| Set of tapered pin punches | 1 |
| Set of parallel pin punches | 1 |
| Steel rule 300mm | 1 |
| File and handle; 300mm flat hand file; second cut or similar | 1 |

| | |
|--|---|
| Brake adjuster; curved, flat | 1 |
| Pair safety glasses | 1 |
| Set of feeler gauges | 2 |
| Spark plug gapping tool | 1 |
| Small electrical test/jumper lead | 2 |
| Circlip pliers – internal and external | 2 |
| Biro or pencil | 1 |
| Digital Multi Meter | 1 |
| Calculator | 1 |
| Noid Light | |

Electrical Equipment test & tag - Organisers and Competitors shall only use electrical equipment that has been tested by a competent person and has a current test tag attached

Demonstrate Good Housekeeping - Organisers and Competitors are required to properly manage their workplace, minimise waste, prevent unavoidable power/gas consumption and use materials and tools effectively.

Safe Work Method Statement - Competitors must complete a Safe Work Method Statement.. Completed Safe Work Method Statements must be submitted to the Chief Judge prior to the start of the competition. No competitor will be allowed to compete in the competition unless a Safe Work Method Statement has been completed. All **competitors and staff** must wear appropriate safety equipment including **safety footwear at all times** while in the competition work area. Any serious breach of safety will result in a fifteen minute penalty being imposed.

Electrical Procedures - Organisers and Competitors involved in any electrical activities associated with the competitions are required to use a safe system of work. This shall include following the WorldSkills Australia Electrical procedure and completing an Electrical Risk Assessment prior to competition

OSH - WorldSkills Canada have already notified all participating countries that there will be a very vigorous OSH regime in place, therefore, as preparation for the WorldSkills International competition, all competitors are required to wear safety footwear and eye protection at all times, as well as gloves if the judge directs. If excess noise becomes a hazard then hearing protection must be worn too. All competitors and staff are encouraged to wear clothing that identifies their employer and helps to publically recognise the support the competition receives from industry.