

Demonstrate Selecting, Using and Maintaining Various Special Tools Correctly

Skill Number CO-OP15GN104

Full Name: Sulthan Fauhan z. A No ID: _____
 Validation Date: 24/11/2025 School: SMK N 1 SINGGASARI

PERFORMANCE TASK:

Given some special tools, the student is requested to perform the following tasks:

- Selecting, using, maintaining various Special Tools in the installation of Engine or other system components.
- Perform close the job by ensuring all systems or conditions is in the standard condition.

Safety and Contamination Control must be applied to this process. All literatures will be available.

| Prerequisite | Completed | | | Hints |
|--|-----------|----|-----|--|
| | Yes | No | N/A | |
| The student must complete the knowledge assessment. Minimum passing grade 80%. | ✓ | | | Score special tools Course or subject. |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---------------------|
| | Yes | No | N/A | |
| Prepare related literature | ✓ | | | |
| Prepare required equipment | ✓ | | | |
| Prepare related tools | ✓ | | | |
| Prepare Safety & Contamination Control equipment | ✓ | | | |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---|
| | Yes | No | N/A | |
| Perform etiquette/manner when starting the job | ✓ | | | |
| Meet the customer / assessor | ✓ | | | |
| Perform etiquette/manner when opening the interaction. | ✓ | | | • Perform smile & greet • Introduce Student's ic |
| Explain the purpose of Student's activity. | ✓ | | | |
| Ask permission to perform the job. | ✓ | | | |

| Tasks | Completed | | | Observation / Hints |
|---|-----------|----|-----|---|
| | Yes | No | N/A | |
| 1. Inspect the Special Tool before using | ✓ | | | Visual inspection of the Special wear, cracks, damage |
| 2. Calibrate the special tool before using | ✓ | | | • Torque wrench |
| 3. Remove and install or disassemble and assemble conducted according to correct procedures | ✓ | | | Equipment and tooling are identified checked for safe and effective of and must refer to Service manual c |
| 4. Tasks completed without damage to equipment and tools | ✓ | | | Component and tooling are clean stored on the right place |
| 5. Equipment and tooling is cleaned and returned to its correct location | ✓ | | | Cleaned and stored equipment t the right place. |
| 6. Work area left clean and tidy | ✓ | | | Area cleaned from spills and waste |
| Documentation: | | | | |
| Take picture if needed | | | | |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---|
| | Yes | No | N/A | |
| Perform close the job by ensuring all systems or conditions is in the standard condition | ✓ | | | • Find the improper condition. • Communicate the finding to the customer/assessor. |
| Ensure all systems or conditions are in standard condition. | ✓ | | | |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---|
| | Yes | No | N/A | |
| Reporting | | | | |
| All relevant documentation completed correctly and approved by customer (if required). | ✓ | | | <ul style="list-style-type: none"> • Completing the Task List • Completing Measurement Form/Related Check Sheet, if required • Create Service Report (SIMS), if required • Create SPR, if required • Documenting the failed or damaged parts, if required • Provide Technical Analysis Report/Failure Analysis Report, if required. |

| Tasks | Complete | | | Observation / Hints |
|---|----------|----|-----|--|
| | Yes | No | N/A | |
| Safety | | | | |
| Using APD related to the job | ✓ | | | |
| Follows relevant workplace safety guidelines (tag out, safety equipment) | ✓ | | | <ul style="list-style-type: none"> • Comply with safety regulation that applied on the workplace |
| State and follow safety precautions | ✓ | | | <ul style="list-style-type: none"> • Create Job Safety Analysis • Student must follow safety procedure refer to service manual or SIS related to job |
| Service man completes job without accident due to incorrect procedure using hand tools. | ✓ | | | <ul style="list-style-type: none"> • Correct working position. • Correct hand tool related to the job |
| Tasks completed without damage equipment and tools | ✓ | | | |

| Tasks | Complete | | | Observation / Hints |
|--|----------|----|-----|---|
| | Yes | No | N/A | |
| Contamination Control | | | | |
| Environmental Practices & Housekeeping | ✓ | | | <ol style="list-style-type: none"> 1. Waste is minimized, waste including sludge, solids and o wastes are sorted and stored for recycling or disposal 2. Packaging of goods received and reused or disposed of by recycling 3. Materials that can be reused cleaned and stored 4. Waste and scrap are removed following workplace procedure 5. All fluids are disposed of in accordance with enterprise procedures |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---|
| | Yes | No | N/A | |
| Perform etiquette/manner after completing the job | ✓ | | | |
| Perform etiquette/manner when closing the communication. | ✓ | | | <ul style="list-style-type: none"> • Perform smile & greet • Ask permission to leave the interaction. |

General Comments

[Faint, illegible text area for general comments]

RESULT: COMPETENT

NOT YET COMPETENT

(Please check (✓))

Student: Sultan Rayhan 24 24/12/2025

Name Date

Signature

Assessor: Delvianus 24/12/2025

Name Date

Signature

Supervisor: Name Date Signature

Name Date

Signature

Data Recorded: Name Date Signature

Name Date

Signature

Demonstrate Selecting, Using and Maintaining Various Special Tools Correctly

Skill Number CO-OP15GN104

CO-OP15GN104 - Candidate Performance Guide

Full Name: Sultun Rayhan Z.A
 Validation Date: 24/12/2025

No ID: _____
 School: SMKN 1 SINGOSAPI

PERFORMANCE TASK:

Given some special tools, the student is requested to perform the following tasks:

- Selecting, using, maintaining various Special Tools in the installation of Engine or other system components.
- Perform close the job by ensuring all systems or conditions is in the standard condition.

Safety and Contamination Control must be applied to this process. All literatures will be available.

| Prerequisite | Completed | | | Hints |
|--|-----------|----|-----|-------|
| | Yes | No | N/A | |
| The student must complete the knowledge assessment Minimum passing grade 80%. | ✓ | | | |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---------------------|
| | Yes | No | N/A | |
| Preparation | | | | |
| Prepare related literature | ✓ | | | |
| Prepare required equipment | ✓ | | | |
| Prepare related tools | ✓ | | | |
| Prepare Safety & Contamination Control equipment | ✓ | | | |

Demonstrate Selecting, Using and Maintaining Various Special Tools Correctly

CO-OP15GN104 - Candidate Performance Guide

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---------------------|
| | Yes | No | N/A | |
| Perform etiquette/manner when starting the job | ✓ | | | |
| Meet the customer / assessor | ✓ | | | |
| Perform etiquette/manner when opening the interaction. | ✓ | | | |
| Explain the purpose of Student's activity. | ✓ | | | |
| Ask permission to perform the job. | ✓ | | | |


| Tasks | Completed | | | Observation / Hints |
|---|-----------|----|-----|---------------------|
| | Yes | No | N/A | |
| 1. Inspect the Special Tool before using | ✓ | | | |
| 2. Calibrate the special tool before using | ✓ | | | |
| 3. Remove and install or disassemble and assemble conducted according to correct procedures | ✓ | | | |
| 4. Tasks completed without damage to equipment and tools | ✓ | | | |
| 5. Equipment and tooling is cleaned and returned to its correct location | ✓ | | | |
| 6. Work area left clean and tidy | ✓ | | | |
| Documentation: | | | | |
| Take picture if needed | | | | |

| Tasks | Completed | | | Observation / Hints |
|--|-----------|----|-----|---------------------|
| | Yes | No | N/A | |
| Perform close the job by ensuring all systems or conditions is in the standard condition | ✓ | | | |
| Ensure all systems or conditions are in standard condition. | ✓ | | | |

ANALISIS LINGKUNGAN KESELAMATAN KERJA / JOB SAFETY ENVIRONMENT ANALYSIS

| | | | | | | | |
|-------------------|-----------------------|---------------------------|---|-----------------|---|------------|---|
| Pekerjaan Task | RI BOLT CYLINDER HEAD | Nomor JSEA JSEA Number | 1 | Halaman Page | 1 | Dari Of | 2 |
|-------------------|-----------------------|---------------------------|---|-----------------|---|------------|---|

| | | | | | |
|--|----------------|--------------------|---------|-------------------------------|--------------|
| Tanggal Pembuatan JSEA Date of JSEA | 24 / 12 / 2025 | Departemen Dept | Service | Tempat Kerja Work Location | Workshop TAB |
|--|----------------|--------------------|---------|-------------------------------|--------------|

| | | | | | | | | | | | |
|-----------------------------|--------|-------------|---|----------------------------|--|-------------|--|--------------------|--|-------------|--|
| Disusun Oleh Compiled By | Sultan | TTD Sign |  | Review Oleh Reviewed By | | TTD Sign | | Atasan Superior | | TTD Sign | |
|-----------------------------|--------|-------------|---|----------------------------|--|-------------|--|--------------------|--|-------------|--|

Apakah Anda sudah terlatih untuk melakukan pekerjaan ini ? / Are you properly trained to complete these task ? Ya / Yes Tidak / No

Apa yang Anda perlukan untuk memastikan bahwa pekerjaan selesai tanpa adanya kecelakaan kerja ? / What do you need to ensure this job is completed incident free ?

Tools yang digunakan sudah sesuai dengan Manual

Siapa yang bertanggung jawab untuk menghentikan pekerjaan jika terjadi perubahan pekerjaan atau gangguan kondisi lingkungan kerja ? / Who is responsible for Stop Work Authority if change job or workplace distraction could ?

ABCD-1 (Technician Leader) / Mr. X (Customer)

Apakah Anda memerlukan peralatan LOTO ? / Are you need LOTO Equipments ? Ya / Yes Tidak / No

Apakah Anda mengetahui ERP/MERP dari pekerjaan yang sedang dilakukan ? Ya / Yes Tidak / No *Jika tidak, silahkan tambahkan dalam urutan langkah tugas diawal*

| | | | | |
|---|-----------------|-------|-----------------|------|
| Kondisi Lingkungan / Environmental Conditions | Cuaca / Weather | Cerah | Medan / Terrain | rata |
|---|-----------------|-------|-----------------|------|

| | | | |
|---|--|--|--|
| Pengendalian Sumber Bahaya / Hazardous Energy Control | <input type="checkbox"/> Listrik / Electrical | <input checked="" type="checkbox"/> Gravitasi (Benda jatuh, tertimpa) / Gravitation (Falling objects, struck down) | <input type="checkbox"/> Pneumatik / Pneumatic |
| | <input type="checkbox"/> Hidraulik / Hydraulic | <input checked="" type="checkbox"/> Mekanis / Mechanical | <input type="checkbox"/> Panas / Thermal |

| | | | |
|------------------------------------|---|--|---|
| APD yang diperlukan / Required PPE | <input checked="" type="checkbox"/> Helm / Safety Helm | <input type="checkbox"/> Pelindung Muka / Face shield | <input checked="" type="checkbox"/> Kacamata / Safety Glass |
| | <input checked="" type="checkbox"/> Sarung Tangan / Hand Gloves | <input type="checkbox"/> Pelindung Pernafasan / Respiratory Protection | <input type="checkbox"/> Perlindungan Kejutahan / Fall Protection |
| | <input checked="" type="checkbox"/> Sepatu / Safety Shoes | <input type="checkbox"/> Pelindung Telinga / Hearing Protection | <input type="checkbox"/> Lain-Lain / Other |

Hal yang perlu dipertimbangan dalam mengidentifikasi bahaya / These to consider in identify hazards :

1 Bahaya Keselamatan : Kondisi tidak aman yang dapat menyebabkan injury atau kematian seperti terpelesep/terjatuh, tertimpa dll.
Safety Hazard : unsafe conditions that can cause injury or even death, such as spill/falls, pinch point, struck by, etc.

2 Bahaya Fisik : Listrik, Api/ledakan, Kebisingan, Radiasi, Panas, Tekanan, Terjepit, Tersandung/Terjatuh, Tertimpa, Getaran.
Physical Hazards : Electrical, Fire/Explosion, Noise, Radiations, Thermal, Pressure, Pinch Point, Slips/Falls, Struck by, Vibration.

3 Bahaya Kimia : Terhirup, terkena kulit, injeksi, tertelan, terserap.
Chemical Hazards : Inhalation, skin contact, injection, ingestion, absorption.

4 Bahaya Biologi : Patogen yang ditularkan melalui darah, jamur, tanaman/serangga/hewan.
Biological Hazards : bloodbone pathogens, mold, Plant/Insect/Animals

5 Bahaya Ergonomi : Gerakan berulang-ulang, beban yang berlebihan, Postur Janggal, Durasi kerja, Desain area kerja.
Ergonomic Hazards : Repetitions, Forcefull extention, Awkward Posture, Duration , Work area desain.

6 Bahaya Organisasi : stres atau bahaya terkait dengan masalah tempat kerja yang menyebabkan efek jangka panjang atau pendek, beban kerja yang berat dan kekerasan ditempat kerja.
Organizational hazards : stressors or hazards associated with workplace issues that cause long or short term effects heavy workloads, stressful interactions and workplaces violence.

| No | Urutan Dasar Langkah Tugas / Job Steps (* Maksimal 15 Langkah / Maximum 15 Steps) | Bahaya Yang Terkait / Potential Hazard(s) | Tindakan Perbaikan / Recommended Action |
|----|--|---|--|
| 1. | Walk Around Inspection | 1.1 Terpelesep fluida 1.2 Tersandung kabel | 1.1.1 lap menggunakan white towel 1.2.1 tara kabel dengan rapi |
| 2. | Prepare tool | 2.1 Tangan terjepit 2.2 Tertimpa tools 2.3 Tools berkarat 2.4 Tools rusak atau rusak | 2.1.1 Hindari titik jepit 2.1.2 gunakan safety gloves 2.2.1 Letakkan tools dengan benar 2.2.2 Simpan tools dalam tool box / box 2.3.1 bersihkan tools dengan Solar 2.4.1 Ganti tools dengan yang baru |
| 3. | Doing Remove cylinder head | 3.1 Tertimpa komponen 3.2 terjatuh saat membuka bolt | 3.1.1 fokus saat bekerja 3.1.2 Ikuti prosedur pelepasan yang benar 3.1.3 gunakan safety shoes 3.2.1 perhatikan posisi pelepasan bolt 3.2.2 Ikuti prosedur pelepasan |
| 4. | Doing OSS & Measuring | 4.1 Terjepit Dermis caniper 4.2 Measuring berkarat | 4.1.1 Hindari titik jepit 4.1.2 gunakan safety gloves 4.2.1 bersihkan karat menggunakan majun 4.2.2 ganti tools dengan yang baru |

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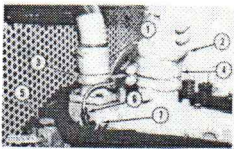
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Remove And Install Cylinder Head

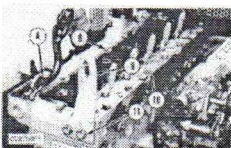
| Tools Needed | | A |
|--------------|--------------|---|
| 6V2156 | Link Bracket | 2 |

Start By:

- remove exhaust manifold
 - remove rocker shaft assembly and push rods
- Drain the coolant from cooling system.



- Loosen clamps (3) and remove hose (1).
- Loosen clamps (4) and disconnect hose (2).
- Remove two bolts (5) that hold the water pump to the cylinder head.
- Unplug connector (6). Disconnect connector (7).



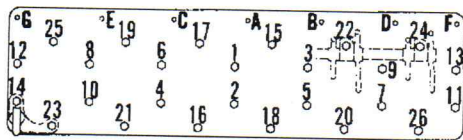
- Remove bolts (11) and plate (9).
- Remove the four bolts, the washers, the cover, and the gasket from the rear opening on the cylinder head. Install tool (A) and fasten a hoist.
- Remove twenty bolts (10) and seven bolts (8). Remove the cylinder head. The weight of the cylinder head assembly is 177 kg (390 lbs.).

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- Put 2P2506 Thread Lubricant on all head bolts and rocker shaft bolts except bolt (25). Install the rocker shaft bolts, bolts (8), and bolts (10) with the washers.
- Tighten the bolts as follows:
 - Tighten bolts 1 through 26 in number sequence to a torque of 155 N·m (115 lb.ft.).
 - Tighten bolts 1 through 26 again in number sequence to a torque of 250 ± 17 N·m (185 ± 13 lb.ft.).
 - Tighten bolts 1 through 26 again in number sequence (hand tighten only) to a torque of 250 ± 17 N·m (185 ± 13 lb.ft.).
 - Tighten bolts A through G in letter sequence (hand tighten only) to a torque of 43 ± 7 N·m (32 ± 5 lb.ft.).
- Make adjustments until the intake valve clearance is .038 mm (.015 in.) and the exhaust valve clearance is 0.64 mm (.025 in.). See the topic, Valve Clearance Setting in Testing And Adjusting. Tighten the locknuts for adjusting screw (13) to a torque of 29 ± 7 N·m (21 ± 5 lb.ft.).
- Put the gasket and cover (12) in position on the cylinder head. Install the four bolts and washers.
- Put plate (9) in position and install bolts (11) and the washers.
- Install the gasket and two bolts (5) that hold the water pump to the cylinder head.
- Connect connector (6) and connector (7).
- Put hose (2) in position and tighten clamps (4).
- Put hose (1) in position and tighten clamps (3).
- Fill the cooling system with coolant to the proper level.

End By:

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NOTICE

Do not set the cylinder head on a flat surface because of possible damage to the fuel injection nozzle tips.

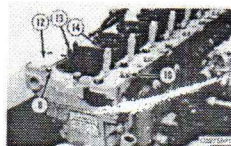
NOTE: The following steps are for the installation of the cylinder head.

NOTE: When the cylinder head is removed, a new spacer plate gasket must be installed. See the topic, Remove And Install Spacer Plate.

9. Make sure the surfaces that make contact between the cylinder head and cylinder block are clean and dry. Install a new gasket on the cylinder block.

10. Install tool (A) on the cylinder head and fasten a hoist. Put the cylinder head in position on the engine.

11. Remove tool (A).



12. Loosen the adjusting screws (13) on the rocker arms for valve clearance. This will prevent a bent valve or push rod during installation of the rocker shaft assembly.

13. Install the push rods.

NOTE: The O-ring seal in the rear support must be installed new each time the bolt is removed from the rear support bracket.

14. Put rocker shaft assembly (14) in position on the cylinder head.

NOTICE

Make sure the dowels on each end of the rocker shaft assembly are in alignment with the holes in the cylinder head.

a. install valve cover

b. install exhaust manifold

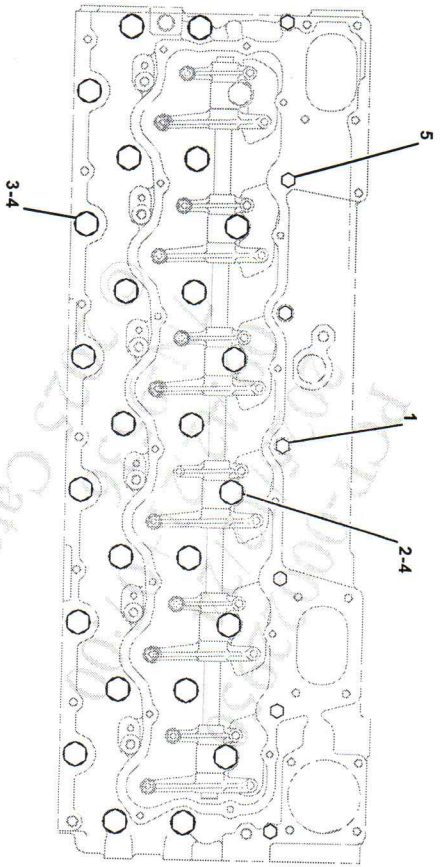
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TOP VIEW OF ENGINE

7N-9536 FASTENER GP-CYLINDER HEAD
 S/N 8523764-UP
 ADDITIONAL CYLINDER HEAD FASTENER BOLT
 AND WASHER CAN BE FOUND IN 7C-7013.

| Image # | Callout # | Part Number | Part Name | Quantity | Image # | Callout # | Part Number | Part Name | Quantity |
|---------|-----------|-----------------|---------------------------|----------|---------|-----------|--------------------|--------------------------------|----------|
| | | 7N-9536 | Fastener GP-Cylinder Head | | | | 1D-4595 | Bolt (5/8-11x6-IN) | 20 |
| | | Part List Items | | | | | 2S-0736 | Washer-Hard (17X27X3.5-MM Thk) | 25 |
| 1 | 1 | 5B-9603 | Bolt (3/8-16X5-IN) | 6 | 4 | | | | |
| 1 | 2 | 1B-7709 | Bolt | 5 | 5 | 5B-9603 | Bolt (3/8-16X5-IN) | 1 | |

B - Use AS Required