

**Demonstrate Carrying Out Jacking, Blocking and Lifting of Heavy Equipment and Components Safely**

2508

Skill Number CO-OP15GN108

Full Name: Vashthi Maulidira S  
 SNSAP ID: \_\_\_\_\_  
 Job Title: Operationg 3508 Branch/Area: \_\_\_\_\_

**PERFORMANCE TASK:**

Given a large machine component, the necessary lifting equipment and lifting chainslings, the student is to lift and move the component from one location to another. The component is to be correctly supported once placed on the ground or workbench. The component is to be supported in a manner that will enable service work to be carried out.

The student must be able to:

- Selecting tools used and identify SWL correctly
- Jack and block Heavy Equipment correctly and safely
- Lift and support engine or machine component correctly
- Follow service procedure on Service Manual correctly
- Follow standard safety & contamination control procedure related to the job
- Perform communication & etiquette manner

Students are to be given a copy of TCU005 Practical Activity 2 – Student Performance sheet and fill out appropriate areas. It is recommended that Facilitators put questions to students regarding the findings of their inspections and subsequent report. The student will also be required to complete relevant workplace documentation and is to observe the correct safety procedures at all times

Safety and Contamination Control must be applied to this process at all times.

Prerequisite	Yes	No	N/A	Hints
The Student must complete the knowledge assessment. Minimum passing grade 80%.	<input checked="" type="checkbox"/>			Score jacking, blocking and lifting course or subject.

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
<b>Preparation</b>				
Prepare related literature	<input checked="" type="checkbox"/>			Practical Activity 1 Worksheet
Work instructions are used to determine job requirements, including method, process and equipment	<input checked="" type="checkbox"/>			Observe if candidate is referring to Manufacturer's specifications and/or service intervals.
Job specifications are read and interpreted. Information is accessed from manufacturer/component supplier specifications and correctly incorporated.	<input checked="" type="checkbox"/>			Observe if candidate is referring to and observing Manufacturer's specifications and/or service intervals
Information is accessed from manufacturer/component supplier specifications and correctly incorporated	<input checked="" type="checkbox"/>			
Prepare required equipment	<input checked="" type="checkbox"/>			
Prepare related tools	<input checked="" type="checkbox"/>			Refer to MOD resources list. Material, components, tooling and equipment to complete work are identified, selected and prepared in accordance with site procedures
Materials, components, equipment and tooling are identified and checked for safe and effective operation	<input checked="" type="checkbox"/>			
Prepare Safety & Contamination Control equipment	<input checked="" type="checkbox"/>			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
<b>Perform etiquette/manner when starting the job</b>				
Meet the customer / assessor	<input checked="" type="checkbox"/>			
Perform etiquette/manner when opening the interaction.	<input checked="" type="checkbox"/>			• Perform smile & greetings. • Introduce Student's identity
Explain the purpose of Student's activity.	<input checked="" type="checkbox"/>			
Ask permission to perform the job.	<input checked="" type="checkbox"/>			



Visual Check	Tasks			Observation / Hints
	Yes	No	N/A	
Participation procedures	✓			Location of site to move component, personnel in the area, support material available at site
Cranelifting apparatus inspection	✓			Inspection of crane or lifting apparatus
Lifting equipment	✓			Inspection of chains/slings or other lifting apparatus.
Support materials	✓			Serviceable and will complete the task safely.

Visual Check	Tasks			Observation / Hints
	Yes	No	N/A	
Site location selected	✓			Safe and secure area, will not affect other Personnel
Supports in place	✓			Tail tape, if required
Jacking and Blocking	✓			Type of load, center of gravity, jacking points, SWL equipment and jacking tool, area ideal for jacking procedure.
Jacking procedure	✓			Jack in correct position
Jack conducted	✓			Type of blocking that use, SWL, Blocking points.
Blocking procedure	✓			Lowered correctly, supports in place, load secured and not moving once placed on ground or bench, jacking tool removed and moved out of the way
Blocking conducted	✓			Job supported to allow work to be conducted.
Blocking allows for service work to be conducted	✓			
Lifting				
Hook up procedures	✓			Check as per 10 steps of safe lifting in Student/Facilitator Guide, type of load, center of gravity, hook up points, hook up



Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Use of Tools and Equipment	✓			points checked, position of hooks, hook-up secure.
Tests and adjustments carried out according to manufacturer's specifications and procedures	✓			Checked security of hook up points, load lifted slightly, check center of gravity, slings not twisted, kinked, binding, easy lift and not jerky, lift straight up and down - no angle on crane
Service is completed without damage to equipment and tools	✓			Minimum distance off the ground to complete task, other personnel considered, swaying or the load controlled.
Equipment and tooling is cleaned and returned to its correct location	✓			Lowered correctly, supports in place, load secured and not moving once placed on ground or bench, lifting tackle removed and moved out of the way
Work area left clean and tidy	✓			Job supported to allow work to be conducted. Use of Tools and Equipment

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Use of Tools and Equipment	✓			points checked, position of hooks, hook-up secure.
Tests and adjustments carried out according to manufacturer's specifications and procedures	✓			Checked security of hook up points, load lifted slightly, check center of gravity, slings not twisted, kinked, binding, easy lift and not jerky, lift straight up and down - no angle on crane
Service is completed without damage to equipment and tools	✓			Minimum distance off the ground to complete task, other personnel considered, swaying or the load controlled.
Equipment and tooling is cleaned and returned to its correct location	✓			Lowered correctly, supports in place, load secured and not moving once placed on ground or bench, lifting tackle removed and moved out of the way
Work area left clean and tidy	✓			Job supported to allow work to be conducted. Use of Tools and Equipment





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

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

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

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"> <li>• Perform smile &amp; greetings.</li> <li>• Ask permission to leave or end the interaction.</li> </ul>







**Demonstrate Carrying Out Jacking, Blocking and Lifting of Heavy Equipment and Components Safely**

Skill Number CO-OP15GN108

Full Name: Vashti M-S

Job Title: Repositioning SPD

SNS/AP ID: \_\_\_\_\_

Branch/Area: \_\_\_\_\_

**PERFORMANCE TASK:**

Given a large machine component, the necessary lifting equipment and lifting chainslings, the student is to lift and move the component from one location to another. The component is to be correctly supported once placed on the ground or workbench. The component is to be supported in a manner that will enable service work to be carried out.

The student must be able to:

- Selecting tools used and identify SWL correctly
- Jack and block Heavy Equipment correctly and safely
- Lift and support engine or machine component correctly
- Follow service procedure on Service Manual correctly
- Follow standard safety & contamination control procedure related to the job
- Perform communication & etiquette manner

Students are to be given a copy of TCU005 Practical Activity 2 – Student Performance sheet and fill out appropriate areas. It is recommended that Facilitators put questions to students regarding the findings of their inspections and subsequent report. The student will also be required to complete relevant workplace documentation and is to observe the correct safety procedures at all times  
Safety and Contamination Control must be applied to this process at all times.

Prerequisite	Yes	No	N/A	Hints
The Student must complete the knowledge assessment. Minimum passing grade 80%.	80%			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
<b>Preparation</b>				
Prepare related literature	✓			
Work instructions are used to determine job requirements, including method, process and equipment	✓			
Job specifications are read and interpreted. Information is accessed from manufacturer/ component supplier specifications and correctly incorporated.	✓			
Information is accessed from manufacturer/ component supplier specifications and correctly incorporated	✓			
Prepare required equipment	✓			
Prepare related tools	✓			
Materials, components, equipment and tooling are identified and checked for safe and effective operation	✓			
Prepare Safety & Contamination Control equipment	✓			

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



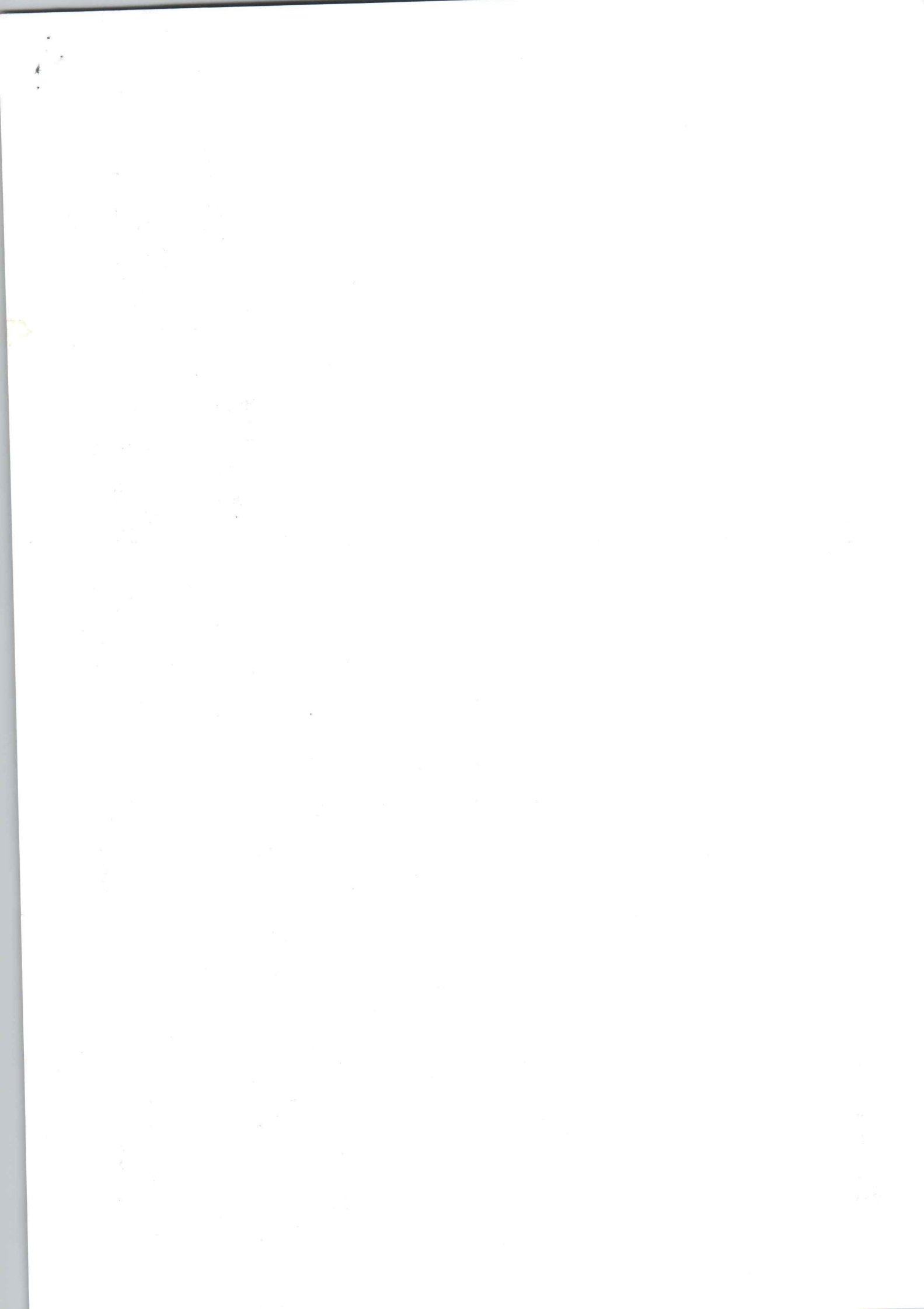
Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Visual Check				
Pre-inspection procedures	✓			
Crane/Lifting apparatus inspection	✓			
Lifting equipment	✓			
Support materials	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Visual Check				
Site location selected	✓			
Supports in place	✓			
<b>Jacking and Blocking</b>				
Jacking procedures	✓			
Jack conducted	✓			
Blocking procedure	✓			
Blocking conducted	✓			
Blocking allows for service work to be conducted	✓			
<b>Lifting</b>				
Hook up procedures	✓			
Lift conducted	✓			
Load moved to chosen site	✓			
Load lowered and supported	✓			
Support allows for service work to be conducted	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
<b>Use of Tools and Equipment</b>				
Tests and adjustments carried out according to manufacturer's specifications and procedures	✓			
Service is completed without damage to equipment and tools	✓			
Equipment and tooling is cleaned and returned to its correct location	✓			
Work area left clean and tidy	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
<b>Reporting</b>				
All relevant documentation completed correctly, and approved by customer (if required).	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
<b>Safety</b>				
Using PPE related to the job	✓			
Follows relevant Workplace Safety Guidelines (LOTO, Safety Equipment)	✓			
State and follow Safety Precautions	✓			
Student completes job without accident due to incorrect procedure using hand tools.	✓			
Tasks completed without damage equipment and tools	✓			



**CO-OP**

CO-OP15GN108 - Candidate Performance Guide

Tasks	Completed		Observation / Hrs
	Yes	No	
Contamination Control	✓		
Environmental Practices & Housekeeping			

Tasks	Completed			Observation / Hrs
	Yes	No	N/A	
Perform etiquette/manner after completing the job	✓			
Perform etiquette/manner when closing the communication.				

**CO-OP**

CO-OP15GN108 - Candidate Performance Guide

General Comments

RESULT:

COMPETENT

NOT YET COMPETENT

(please check (N))

Serviceperson:

Joshua Manikara

Date 13/12/25

Signature 

Assessor:

Sebastian

Date 12/12/25

Signature 

Supervisor:

Name

Date

Signature

Date Recorded:

Name

Date

Signature



12/02/2025

Crankshaft - Install (SENRR6564-32)

SMCS - 1202

1:0449622

## Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	4C-9832	Engine Roller Stand	1
B	439-3941	Link Bracket As	2
C	-	Bel-Ray Molyube 301082 <sup>(1)</sup>	-
D	8T-5096	Dial Indicator Gp	1

(1) Refer to the following link to order molyube specified above - [www.Delray.com](http://www.Delray.com).

### NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

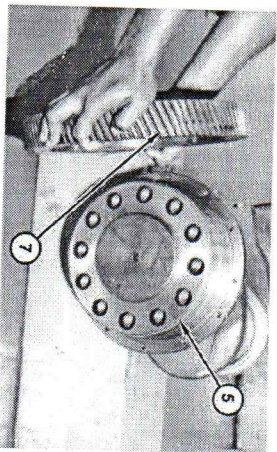


Illustration 1

901049072

1. If crankshaft gear (7) was removed, install the gear on crankshaft (5).

2. Check the clearance of the main bearings. Refer to Disassembly and Assembly Clearance - Check".

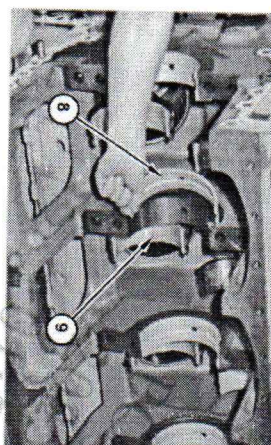


Illustration 2

901049073

**Note:** The upper halves of the main bearings have an oil hole in the center.

3. Install the upper halves of the main bearings (8) in the cylinder block. Coat the bearings with clean engine oil.
4. Install the upper halves of connecting rod bearings (9) in the connecting rod assembly. Coat the bearings with clean engine oil.

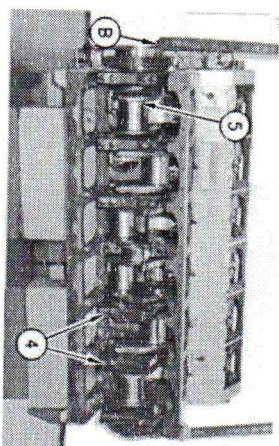


Illustration 3

9009330694

**Note:** Ensure that the word "FRONT" that is on the end of the crankshaft is toward the engine.

5. Attach Tooling (B) and a suitable lifting device to crankshaft (5). For 3508 Engines crankshaft weighs approximately 398 kg (877 lb). For 3512 Engines, the crankshaft weighs approximately 590 kg (1300 lb). For 3516 Engines, the crankshaft weighs approximately 800 kg (1764 lb). Position the crankshaft in the cylinder block.
6. Ensure that the lower halves of the main bearings are in position in the main bearings. Coat the bearings with clean engine oil.

PCP-00022950  
2025/12/13  
01:53:53+07:00  
i01155703  
© 2025 Caterpillar Inc.

**Note:** Main bearing caps (4) must be installed with the word "FRONT" and the part number toward the front of the engine. Each main bearing cap has a number on the bottom surface and each main bearing must be installed in the corresponding position in the cylinder block.

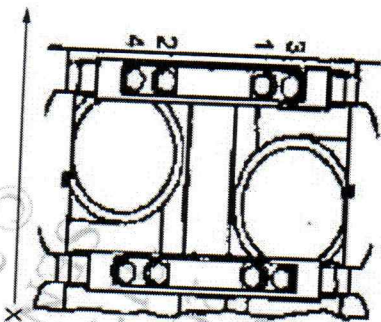


Illustration 4

g03887353

7. Coat the threads of the bolts for the main bearing caps with clean SAE 30 engine oil. Except for the center main bearing cap, place the main bearing caps into position. Install the bolts and washers.

Tighten the bolts according to the sequence that is shown in Illustration Arrow (X) points to the front of the engine. Tighten the bolts to a torque of  $190 \pm 14$  N·m ( $140 \pm 10$  lb ft). Then tighten the bolts for an extra  $180 \pm 5$  degrees ( $1/2$  turn).

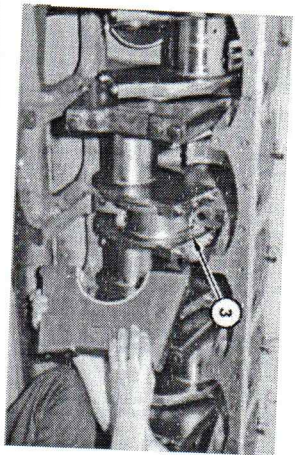


Illustration 5

g01049103

8. Place clean engine oil on thrust plates (3). Install thrust plates (3).

9. Install the center main bearing. Use the tightening procedure that is in Step 7.
10. Use Tooling (D) to measure the end play of the crankshaft. The end play must be 0.17 to 0.63 mm (0.007 to 0.025 inch).

11. Make sure that the upper halves of the bearings are in position on the connecting rod. Make sure that the lower halves of the bearings are in position on the connecting rod.

12. Check the clearance of the connecting rod bearings. Refer to Disassembly and Reassembly for "Bearing Clearance - Check".

13. Position one connecting rod onto a journal of the crankshaft.

**Note:** The number that is on the side of the connecting rod caps must be installed on the side of the connecting rod.

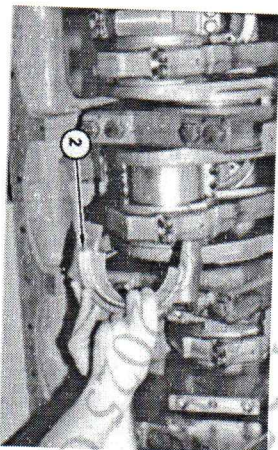


Illustration 6

g01049104

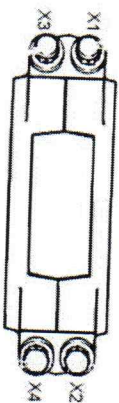


Illustration 7

g06120079

14. Place Tooling (C) on the bolt threads, shanks, and seats.

15. Place connecting rod cap (2) into position. Install the bolts. Use the following procedure to tighten the bolts:



- a. Tighten Bolts (X1) and (X3) to a torque of  $90 \pm 5 \text{ N}\cdot\text{m}$  ( $65 \pm 4 \text{ lb}\cdot\text{ft}$ ).
- b. Tighten Bolts (X2) and (X4) to a torque of  $90 \pm 5 \text{ N}\cdot\text{m}$  ( $65 \pm 4 \text{ lb}\cdot\text{ft}$ ).
- c. Tighten Bolts (X2) and (X4) again to a torque of  $90 \pm 5 \text{ N}\cdot\text{m}$  ( $65 \pm 4 \text{ lb}\cdot\text{ft}$ ).
- d. Tighten each bolt for an extra  $90 \pm 5$  degrees ( $1/4$  turn). An impact wrench may be used.

16. After measuring the clearance of the connecting rod bearing, coat the bearings with clean engine oil. Use the same procedure to install the remaining connecting rod caps.

#### NOTICE

Each counterweight is numbered and must be installed in the same position as the corresponding number on the crankshaft mounting pad in order to prevent damage to the crankshaft.

#### NOTICE

If counterweights pads are machined and new counterweights are installed the crankshaft must be balanced before returning to the engine. Refer to the crankshaft balance in "Reuse and Salvage for Crankshafts" [SEBF8042](#).

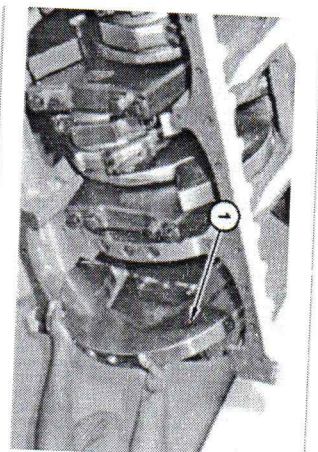


Illustration 8

g01049106

17. If the counterweights have been removed, install counterweights (1). Use the tightening procedure for the specific engine model:

18. The following procedure is for the installation of the counterweights in 3

**Note:** Do not reuse counterweight bolts.

- a. Ensure that the dowels are in the correct position and install the counterweight crankshaft.
- b. Apply Tooling (C) to the bolt threads, shanks, and seats.
- c. Tighten the outer bolts first then the inner bolt to a torque of  $200 \pm 5 \text{ N}\cdot\text{m}$  ( $147 \pm 4 \text{ lb}\cdot\text{ft}$ ).
- d. Loosen the bolts.
- e. Tighten the bolts in the same sequence to a torque of  $70 \pm 5 \text{ N}\cdot\text{m}$  ( $50 \pm 4 \text{ lb}\cdot\text{ft}$ ).
- f. Tighten the bolts in the same sequence for an extra  $120 \pm 5$  degrees ( $1/3$  turn).

19. The following procedure is for the installation of the counterweights in 35 Engines.

**Note:** Do not reuse counterweight bolts.

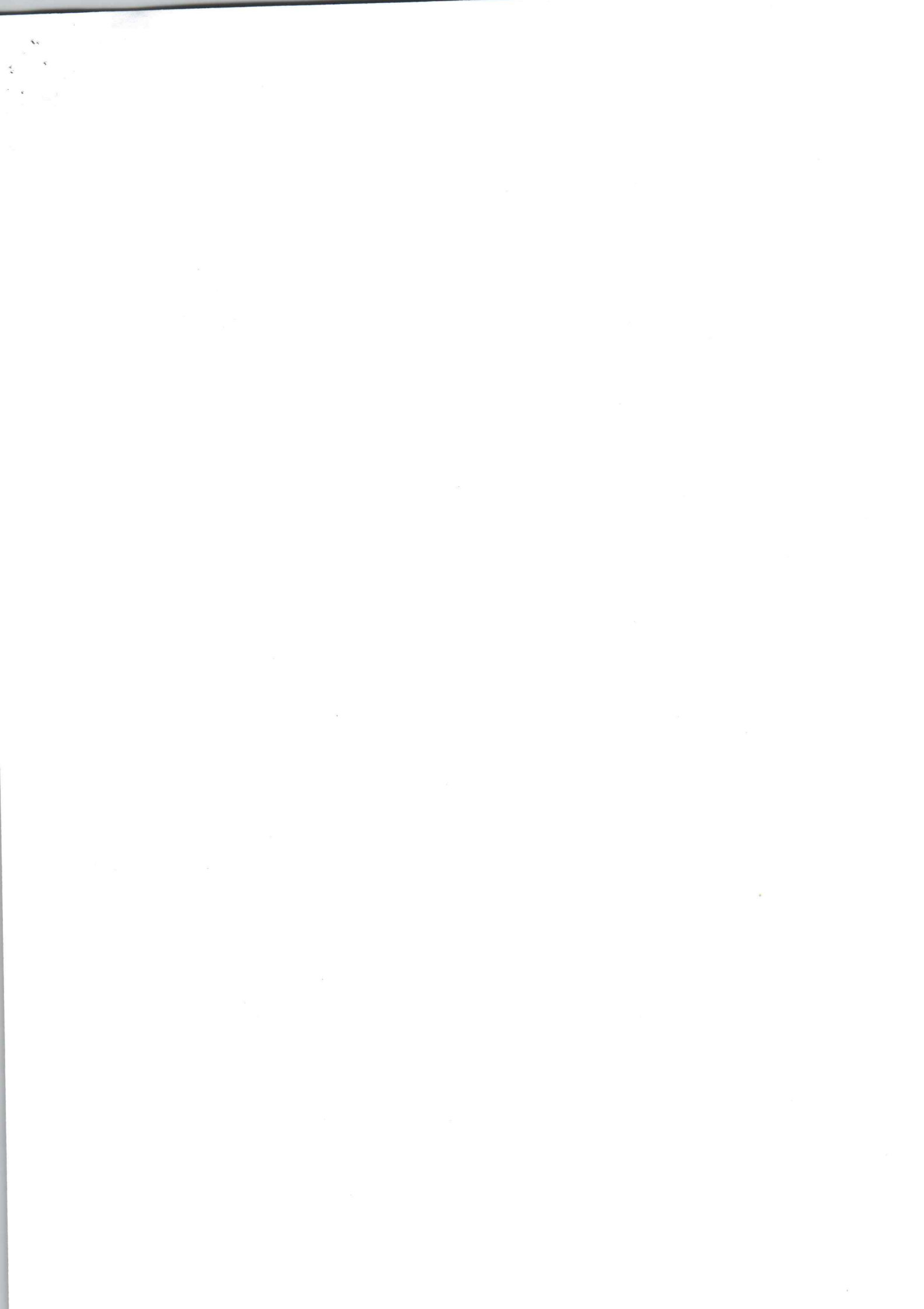
- a. Ensure that the dowels are in the correct position and install the counterweight crankshaft.
- b. Apply Tooling (C) to the bolt threads, shanks, and seats.
- c. Tighten the outer bolts first then the inner bolt to a torque of  $70 \pm 5 \text{ N}\cdot\text{m}$  ( $50 \pm 4 \text{ lb}\cdot\text{ft}$ ).
- d. Tighten the bolts in the same sequence for an extra  $120 \pm 5$  degrees ( $1/3$  turn).

20. Use Tooling (A) to turn the engine to a vertical position.

**Note:** For more information on the crankshaft, refer to Specifications.

**End By:**

- a. Install the piston cooling jets.
- b. Install the flywheel housing.
- c. Install the balancer gear on the rear gear group.
- d. Install the front housing.
- e. Install the rocker shaft assemblies and the pushrods.



**ANALISIS LINGKUNGAN KESELAMATAN KERJA / JOB SAFETY ENVIRONMENT ANALYSIS**

Nomor Formulir / Form Number SHE.SHE.FRM.005.R04

Pekerjaan / Task: **Lifting crankshaft 3508**

Tanggal Pembuatan JSEA / Date of JSEA: **13 Desember 2025**

Disusun Oleh / Compiled By: **Nashti**

TTD Sign: *[Signature]*

Review Oleh / Reviewed By: **SHE**

Tempat Kerja / Work Location: **Workshop TAB**

Atasan / Superior: \_\_\_\_\_

TTD Sign: \_\_\_\_\_

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

Tools yang digunakan sudah sesuai dengan Manual?  Ya / Yes  Tidak / No

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?  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

- Listrik / Electrical
- Hidraulik / Hydraulic
- Gravitasi (Benda jatuh, tertimpa) / Gravitation (Falling objects, struck down)
- Mekanis / Mechanical
- Pneumatik / Pneumatic
- Panas / Thermal

APD yang diperlukan / Required PPE

- Helm / Safety Helm
- Sarung Tangan / Hand Gloves
- Sepatu / Safety Shoes
- Pelindung Muka / Face shield
- Pelindung Pernafasan / Respiratory Protection
- Pelindung Telinga / Hearing Protection
- Kacamata / Safety Glass
- Perlindungan Kejutahan / Fall Protection
- 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, 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: bloodborne 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 (* Maksimum 15 Langkah / Maximum 15 Steps)	Bahaya Yang Terkait / Potential Hazard(s)	Tindakan Perbaikan / Recommended Action
<b>A ERP/MERP</b>			
1.	Saat pekerjaan terjadi gempa	tertimpa reruntuhan	1.1 Segera evakuasi menuju master point baru ditetapkan/ tempat terbuka 1.2 Melaporkan kejadian kepada atasan
2.	Saat pekerjaan ada teknisi yang pingsan	Cidera kepala, tangan tergores	2.1 Lakukan protokol P3K 2.2 Segera evakuasi korban menuju fasilitas kesehatan terdekat 2.3 Melaporkan kejadian kepada atasan
<b>B Langkah Pekerjaan</b>			
1.	Walk around inspection	Tersandung komponen	1.1 pastikan jalur lifting tidak ada komponen lain 1.2 Letakkan komponen ditempatnya 1.3 Gunakan APD (safety shoes)
		Terpelesep lantai	1.4 Bersihkan lantai dengan sapu / pel 1.5 Tetap berhati-hati
2.	Prepare tools	Pemegangan tools yang salah	2.1 Tidak bergurau saat mengambil tools 2.2 Gunakan safety gloves. 2.3 Periksa tools 2.4 Perhatikan lingkungan sekitar
		Tertimpa tools	2.5 Gunakan safety helmet.
		Tersjepit komponen	3-1 Hindari titik jepit 3.2 perhatikan kontak fisik saat pengangkatan 3.3 Lakukan lifting dengan posisi yang benar dan nyaman
	Doing lifting and moving crankshaft 3508	Bahaya ergonomi saat lifting	

