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

Skill Number CO-OP15GN108

Full Name: Maryana Acacia C. **SN/SAP ID:** 11

Job Title: DA Differential **Branch/Area:** WORKSHOP TAB

PERFORMANCE TASK:

Given a large machine component, the necessary lifting equipment and lifting chains/slings, 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 TCL005 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%.	✓			Score jacking, blocking, and lifting course or subject.

Tasks	Completed Yes	No	N/A	Observation /
Preparation				
Prepare related literature Work instructions are used to determine job requirements, including method, process and equipment	✓			*Practical Activity 1 W*
Job specifications are read and interpreted. Information is accessed from manufacturer/ component supplier specifications and correctly incorporated.	✓			*Observe if candidate to Manufacturer's sp and/ or service interv*
Information is accessed from manufacturer/ component supplier specifications and correctly incorporated				*Observe if candidate to and observing Mar specifications and/o intervals*
Prepare required equipment	✓			
Prepare related tools Materials, components, equipment and tooling are identified and checked for safe and effective operation	✓			*Refer to MOD reso Material, componen and equipment to work are identified, s prepared in accordan procedures*
Prepare Safety & Contamination Control equipment	✓			

Tasks	Completed Yes	No	N/A	Observation /
Perform etiquette/manner when starting the job				
Meet the customer / assessor	✓			
Perform etiquette/manner when opening the interaction.	✓			• Perform smile & gr • Introduce Student's
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	✓			*Location of site to move component, personnel in the area, support material available at site*
Crane/Lifting 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.*

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Visual Check				
Site location selected	✓			Safe and secure area, will not affect other Personnel
Supports in place	✓			Tail rope, if required
Jacking and Blocking				
Jacking procedures	✓			*Type of load, center of gravity, jacking points, SWL equipment and jacking tool, area ideal for jacking procedure.*
Jack conducted	✓			*Jack in correct position*
Blocking procedure	✓			*Type of blocking that use, SWL, Blocking points.*
Blocking conducted	✓			*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 allows for service work to be conducted	✓			*Job supported to allow 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*

				points checked, po hooks, hook-up secure
Lift conducted	✓			*Checked security of points, load lifted sligh center of gravity, s twisted, kinked, bindin and not jerky, lift straig down - no angle on cra*
Load moved to chosen site	✓			*Minimum distance off t to complete task personnel considered, of the load controlled.*
Load lowered and supported	✓			*Lowered correctly, su place, load secured moving once placed o or bench, lifting tackle and moved out of the w*
Support allows for service work to be conducted	✓			*Job supported to allow be conducted.* *Use of Tools and Equip*

Tasks	Completed			Observation / Hi
	Yes	No	N/A	
Use of Tools and Equipment				
Tests and adjustments carried out according to manufacturer's specifications and procedures	✓			
Service is completed without damage to equipment and tools	✓			*Tooling is check serviceability and re found unserviceable*
Equipment and tooling is cleaned and returned to its correct location	✓			*Unserviceable equipme tooling is tagged ar identified in accorda workshop requirements*
Work area left clean and tidy	✓			

Tasks	Completed			Observation / Hints
	Yes	No	N/A	
Reporting				
All relevant documentation completed correctly, and approved by customer (if required).	✓			• 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	Completed		Observation / Hints
	Yes	No	
Safety			
Using PPE related to the job	✓		
Follows relevant Workplace Safety Guidelines (LOTO, Safety Equipment)	✓		• Comply with safety regulation that applied on the workplace
State and follow Safety Precautions	✓		• Create Job Safety Analysis • Student must follow safety procedure refer to service manual or SIS related to job
Student completes job without accident due to incorrect procedure using hand tools.	✓		• Correct working position • Correct hand tool related to the job
Tasks completed without damage equipment and tools	✓		

Tasks	Completed		Observation / Hints
	Yes	No	
Contamination Control			
Environmental Practices & Housekeeping	✓		1. *Waste is minimized, waste ma including sludge; solids and o wastes are sorted and stored recycling or disposal* 2. *Packaging of goods received and reused or disposed of by* 3. *Materials that can be reused cleaned and stored* 4. *Waste and scrap is removed workplace procedures* 5. *All fluids are disposed of in ac with enterprise policies and p*

Tasks	Completed			Observation / H
	Yes	No	N/A	
Perform etiquette/manner after completing the job				
Perform etiquette/manner when closing the communication.	✓			• Perform smile & gree • Ask permission to lea the interaction.

General Comments

RESULT: COMPETENT ☑ NOT YET COMPETENT ☐ (please check (√))

	Name	Date	Signature
Serviceman:	Meryana	23.02.2026	
Assessor:	Setiawan T.P.	23/02/2026	
Supervisor:			
Data Recorded:			

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

Skill Number CO-OP15GN108

Full Name: Merryana Aderiachirsty SN/SAP ID: 11

Job Title: PA Differential Branch/Area: WORKSHOOP TAB

PERFORMANCE TASK:

Given a large machine component, the necessary lifting equipment and lifting chains/slings, 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.

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

Prerequisite	Yes	No	N/A	Hints
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Tasks	Completed: Yes	No	N/A	Observation / Hints
Preparation				
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: Yes	No	N/A	Observation / Hints
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.	✓			

19/03/2024 Differential and Bevel Gear (Front and Rear) - Disassemble (M0082513-30)

SMCS - 3256, 3258 i10135287

Disassembly Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1U-7502	Repair Stand	1
B	439-3938	Link Bracket As	2
C	456-4371	Lever Hoist	1
D	1P-5546	Crossblock	1
E	6V-3160	Double Acting Cylinder	1
F	1P-0520	Driver Group	1
H	6V-4070	Spanner Wrench	1
J	8B-7551	Bearing Puller	1
K	5F-7343	Bearing Puller Gp	1

Start By:

a. Remove the front or rear differential assembly. Refer to Differential and Bevel Gear (Front and Rear) - Remove and Install .

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Apply location marks on all housings and case assemblies for assembly purposes.

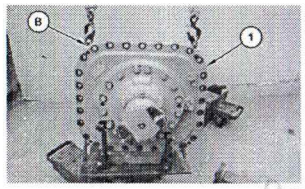

Illustration 1 g03865438

2. Attach Tooling (B) and a suitable lifting device to differential and bevel gear assembly (1). The weight of differential and bevel gear assembly (1) is approximately 322 kg (710 lb).

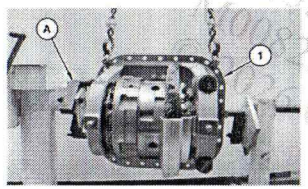

Illustration 2 g03865440

3. Position and place differential and bevel gear assembly (1) onto Tooling (A). Remove Tooling (B) and the suitable lifting device.

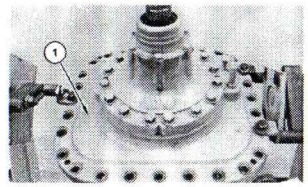

Illustration 3 g03865449

4. Rotate differential and bevel gear assembly (1) by 90 degrees.

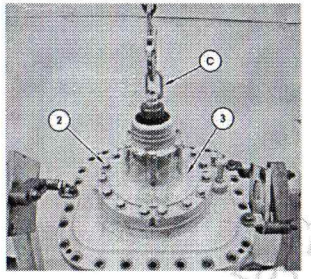

Illustration 4 g03865468

5. Attach Tooling (C) and a suitable lifting device to the yoke. The weight of pinion housing (3) is approximately 75 kg (165 lb). Remove bolts (2).

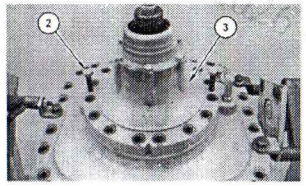

Illustration 5 g03865471

6. Install two bolts (2) in the threaded holes of pinion housing (forcing bolt holes). Tighten two bolts (2) evenly to separate pinion housing (3). Remove pinion housing (3).

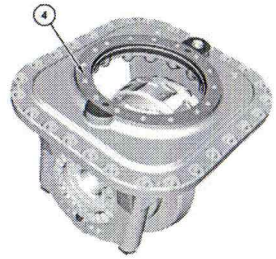

Illustration 6 g03865526

7. Remove shims (4).

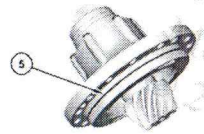

Illustration 7 g03865544

8. Remove O-ring seal (5).

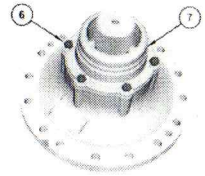

Illustration 8 g03865553

9. Position the pinion housing onto suitable cribbing.

10. Remove bolts (6) and retainer (7).

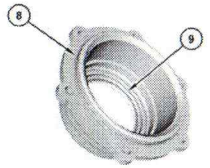

Illustration 9 g03865904

11. Remove O-ring seal (8) and lip seal (9).

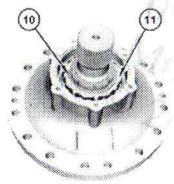

Illustration 10 g03865905

12. Remove retaining ring (10) and locking washer (11).

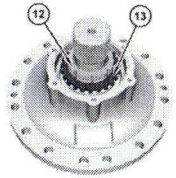

Illustration 11 g03865906

13. Use Tooling (H) (not shown) to remove locknut (12). Remove locknut (12) and notched washer (13).

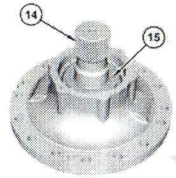

Illustration 12 g03865972

14. Use a suitable press to remove pinion shaft (14) from bearing cone (15).

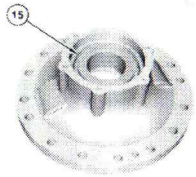

Illustration 13 g03865973

15. Remove bearing cone (15).

Illustration 14 g03865974
Typical Example

16. Use a suitable press and Tooling (J) (not shown) to remove bearing cup (16).

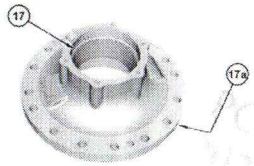

Illustration 15 g03865975

17. Remove bearing cup (17) and bearing cup (17a).

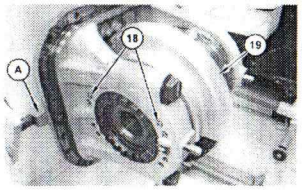

Illustration 16 g03865976

18. Rotate the carrier and differential assembly by 90 degrees on Tooling (A).

19. Remove four bolts (18) and guard (19).

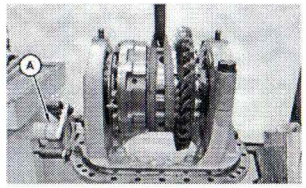

Illustration 17 g03865999

20. Use a suitable lifting device to position the carrier and differential assembly on Tooling (A). The weight of the carrier and differential assembly is approximately 234 kg (516 lb).

21. Rotate the carrier and differential assembly an additional 90 degrees on Tooling (A).

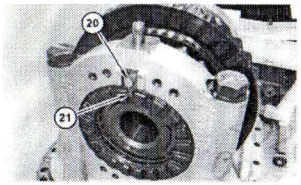

Illustration 18 g03866003

22. Remove bolt (20) and lock (21). Repeat for the opposite side.

SMCS - 3256, 3258 i10016954

Assembly Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1U-7502	Repair Stand	1
B	438-3938	Link Bracket As	2
C	456-4371	Lever Hoist	1
D	1P-5546	Crossblock	1
E	6V-4070	Spanner Wrench	1
L	-	Grease	-
M	9S-8864	Plate	1
	5P-8715	Bending Bolt	1
N	350-7768	Electric Hydraulic Pump Gp ((115 V)	1
	350-7769	Electric Hydraulic Pump Gp (230 V)	1
	478-3993	Torque Wrench	1
P	9U-5017	Torque Wrench	1
R	8T-5096	Tool Group	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

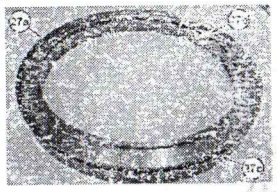

Illustration 1 g03866065

1. Install D-ring seal (27b) and D-ring seal (27c) in clutch piston (27a). Apply a liberal amount of Tooling (L) to D-ring seal (27b) and D-ring seal (27c).

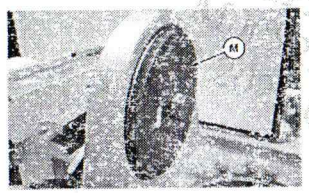

Illustration 2 g03866988

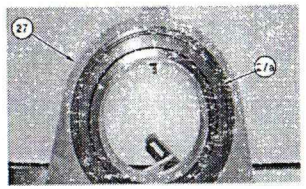

Illustration 3 g03866237

2. Use Tooling (M) to install clutch piston (27a) into carrier assembly (27).

g03866231

Illustration 9 g03866124

8. Install spider gear assembly (41).

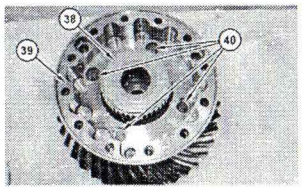

Illustration 10 g03866119

Note: Align the housing to the orientation as marked during the disassembly.

9. Align and install housing (39). Lubricate gear (38) with the lubricant that is being sealed. Install gear (38) and bolts (40). Make sure that gear (38) turns freely.

10. Perform the following procedure to control preload accurately and backlash setting:

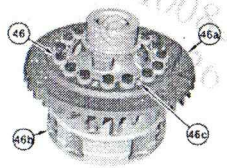

Illustration 11 g03870665

Note: Do not install all bolts (46) until the following procedure is completed.

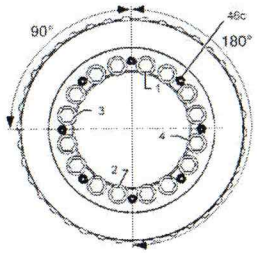

Illustration 12 g03870679

a. Raise bevel gear (46a) to a temperature between 70° C (158° F) and 120° C (248° F). Install bevel gear (46a) to differential case (46b).

b. Install spring pins (46c) to align bevel gear (46a) to differential case (46b).

c. Install four bolts (46) as indicated by callouts (1) through (4) in Illustration 12 . To seat bevel gear (46a) to differential case (46b), tighten four bolts (46) in the pattern that is indicated by callouts (1) through (4). Tighten four bolts (46) to a minimum torque of 70 N·m (52 lb ft).

d. Install remaining bolts (46) loosely (a minimum of one to two revolutions).

e. Confirm bevel gear (46a) is seated in differential case (46b).

f. Allow bevel gear (46a) to cool to a temperature of 30° C (86° F) or less

g. Loosen four initially tightened bolts (46) as indicated in Illustration 12 .

h. Tighten bolts (46) to a final torque of 95 ± 10 N·m (70 ± 7 lb ft). Turn bolts (46) an additional 180 degrees ± 10 degrees.

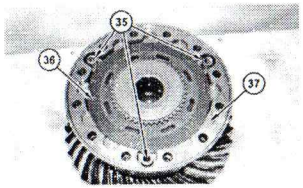

Illustration 13 g03666114

⚠ WARNING

Improper assembly of parts that are spring loaded can cause bodily injury.

To prevent possible injury, follow the established assembly procedure and wear protective equipment.

11. Thoroughly coat eight separator plates (37) and eight friction discs (36) with the lubricant that is being sealed.
12. First install bottom separator plate (37), then install one friction disc (36). Continue in this way until you install the last friction disc (36) at the top.
13. Install springs (35).

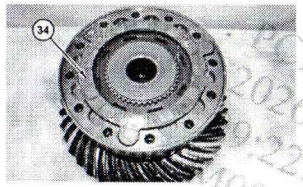

Illustration 14 g03866103

14. Install thrust plate (34).

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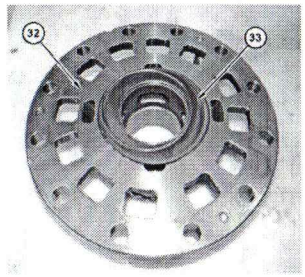

Illustration 15 g06637152

15. Lubricate thrust washer (33) with the lubricant that is being sealed. Install thrust washer (33) on back side of top clutch housing (32).

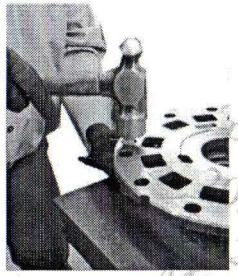

Illustration 16 g06783402

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Illustration 4 g03866231

3. Install roll pins (47) into bevel gear (48).

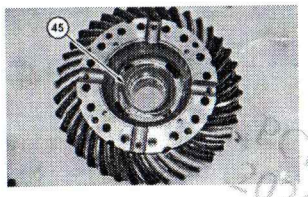


Illustration 5 g03866175

4. Install thrust washer (45).

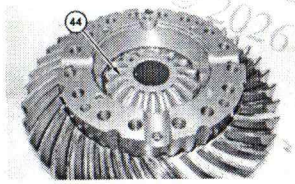


Illustration 6 g03866169

5. Lubricate gear (44) with the lubricant that is being sealed. Install gear (44). Make sure that gear (44) turns freely.

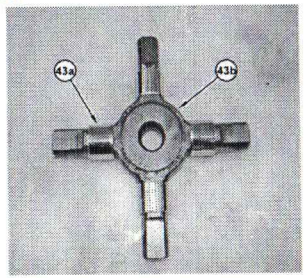


Illustration 7 g03870010

6. Lubricate spider (43b) with the lubricant that is being sealed. Lubricate bearing sleeves (43a) with the lubricant that is being sealed. Install bearing sleeves (43a) on spider (43b).

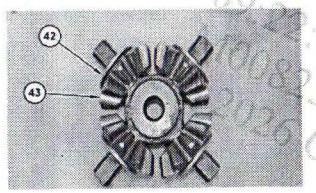
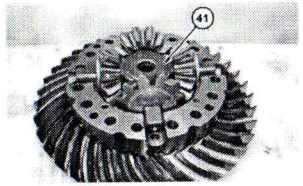


Illustration 8 g03866131

7. Lubricate gears (43) and thrust washers (42) with the lubricant that is being sealed. Install gears (43) and thrust washers (42). Make sure gears (43) turn freely.



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

ANALISIS LINGKUNGAN KESELAMATAN KERJA / *JOB SAFETY ENVIRONMENT ANALYSIS*

Pekerjaan / *Task*	lifting differential	Nomor JSEA / *JSEA Number*	3	Halaman / *Page*	1	Dari / *Of*	2

Tanggal Pembuatan JSEA / *Date of JSEA*	12 - 01 - 2026	Departemen / *Dept*		Tempat Kerja / *Work Location*	WORKSHOP TAB

Disusun Oleh / *Compiled By*	Meryana	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*	Mendung	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 Kejatuhan / *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 terjepit, terpeleset/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* (* Maksimum 15 Langkah / *Maximum 15 Steps*)	Bahaya Yang Terkait / *Potential Hazard(s)*	Tindakan Perbaikan / *Recommended Action*
1.	Walk around inspection	1.1. kursi berceceran	1.1.1 menyingkirkan / menata kursi dengan r
		1.2. area kerja kotor	1.2.1 menyapu area kerja yang kotor
2.	prepare tools	2.1. tertimpa pallet	2.1.1 berhati-hati saat membawa pallet
		2.2.	
3.	Doing lifting differential	3.1. terjepit komponen	3.1.1 hindari titik jepit
			3.1.2 berhati-hati saat periksa beban.
		3.2 menabrak tiang crane	3.2.1 fokus saat bekerja
		3.3. terbentur crane	3.3.1 gunakan APD lengkap
			3.3.2 jangan dibawah crane saat mengarahkan crane.
		3.4. tangan terjepit saat memasang sling	3.4.1 perhatikan saat memasang sling
		3.5. sling tergelincir	3.5.1 pastikan sling terpasang dengan benar
			3.5.2 gunakan pengikatan yang benar.
		3.6. tertimpa komponen	3.6.1 berhati hati saat mengarahkan crane
			3.6.2 pastikan beban yang diangkat seimbang
			3.6.3 jangan dibawah crane saat pengangkatan
		3.7. tangan terjepit shackle	3.6.4 berhati-hati saat melepas shackle
			3.6.2. gunakan APD lengkap
			3.6.3 fokus saat bekerja

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Nomor Formulir / *Form Number*	SHE.SHE.FRM.005.R03

ANALISIS LINGKUNGAN KESELAMATAN KERJA / JOB SAFETY ENVIRONMENT ANALYSIS

Pekerjaan / *Task*	lifting differential	Nomor JSEA / *JSEA Number*		Halaman / *Page*		Dari / *Of*	

No	Urutan Dasar Langkah Tugas / *Job Steps*	Bahaya Yang Terkait / *Potential Hazard(s)*	Tindakan Perbaikan / *Recommended Action*
9.	housekeeping	9.1 lifting tools berceceran	9.1.1 rapikan kembali tools yang tercecer 9.1.2 membersihkan tools dengan white towel.

Bukti sosialisasi / *Evidence of socialization* :

No	Nama / *Name*	TTD / *Sign*
1	Meryana	
2	hamzah	
3	galen	
4		
5		

No	Nama / Name	TTD / Sign

No	Nama / Name	TTD / Sign

Bagian Dari / *Part Of*	SHE.SHE.SOP.003.R04