Drop Table - Safe Operation

Document no.
SMS-06-SW-1246

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Work description
This SWI describes the safe operation of a drop table at a Maintenance Centre.

Scope
This SWI applies to the use of the drop table at the Hornsby Maintenance Centre (HMC).
This SWI does not relate to the work being carried out (i.e. a bogie or alternator change). Refer to the relevant system SWIs for additional information.
This document does not replace technical "how to" documents such as engineering, operational and manufacturers' instructions etc.

References
- OHS Act 2000
- NSW OHS Regulation 2001
- NSW Rail Safety Act 2008
- ASCC National Code of Practice Manual Handling
- HM-0024-QAP (Alternator Trolley)
- SMS-06-GD-0225 Plant
- SMS-06-GD-0403 Plant Risk Assessment
- SMS-06-GD-0001 Guide to Manual Handling
- SMS-06-PR-0104 Workplace Risk Management
- SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out
- SMS-06-GD-0323 Personal Protective Equipment
- SMS-16-SR-0057 Inspection and testing
- SMS-06-SW-0269 Electric Shock Protocol
- SMS-06-SW-0812 Working in the Pit
- SMS-06-SW-1151 Overhead Travelling Crane - Safe Operation
- SMS-06-SW-0838 Pantograph Raising and Lowering
- SMS-06-SW-1248 Bogie System (02) Safe Working
- SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres

Responsible supervisor	PPE and precautions	Competencies or qualifications	Licences or permits required
Line Manager	• High visibility clothing or vest • Appropriate safety footwear • Appropriate protective gloves • Bump hat • Appropriate protective eyewear • Appropriate hearing protection	• Rail Industry Safety Induction (RISI) • Competent in the use of this SWI • Dogman certification as required • Manual handling training • Competent in the fitting of lifting equipment to engineered lifting points	• Certificate of competency to operate an overhead travelling crane

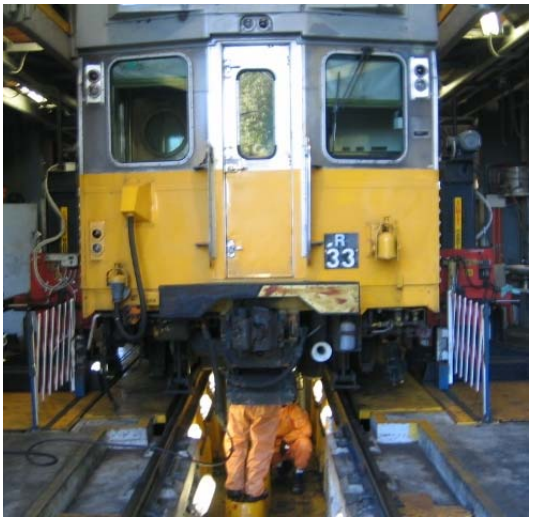
Tools and equipment required

Red Flag
Chocks

IF CONTROL MEASURES ARE NOT SUITABLE AND MAJOR CHANGES ARE NEEDED, CONDUCT A RISK ASSESSMENT AND DEVELOP NEW CONTROLS ACCORDING TO SMS-06-PR-0104 Workplace Risk Management.

Note

Pre work brief and task risk assessment.
Ensure that the individual or team assesses any risks associated with this work activity. If any new/additional team members arrive any time later they must be briefed before they commence work.



Example

Photo 1. View of the Service Road

Warning

The following warnings apply throughout this SWI:

- *Never place any part of your body in a position that could result in injury should the load move unexpectedly.*
- *If at any time during an inspection or the operation of the drop table, any person notices wear, damage or other signs of abnormal operation, all work with it is to cease. Have an "Out of Service" tag fitted in accordance with* SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out *and do not proceed again until the issue is investigated and rectified by an appropriately qualified person. For generally purposes refer to:* SMS-06-GD-0225 Plant, SMS-06-GD-0403 Plant Risk Assessment *and* SMS-16-SR-0057 Inspection and testing.
- *Working with and around the drop table places you in proximity to open pit areas. Failure to establish all safety barriers / chains exposes persons to a significant fall hazard which could result in serious injury or death.*
- *To prevent hearing damage wear appropriate hearing protection when using or releasing compressed air. Refer to:* SMS-06-GD-0323 Personal Protective Equipment.
- *Removal of the bogie requires work in a maintenance pit. Ensure all work is carried out in accordance with* SMS-06-SW-0812 Working in the Pit.
- *All work on bogies is to be carried out in accordance with* SMS-06-SW-1248 Bogie System (02) Safe Working.
- *Isolation of all relevant circuits, including the placement of a lock and/or tag in accordance with* SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out, *is required before any work on electrical components commences. Failure to correctly isolate electrical equipment before interacting with it could result in injury or death. Always verify isolation has been achieved before proceeding with work. For generally purposes refer to :* SMS-06-SW-0269 Electric Shock Protocol.

Place Red Flag

To notify persons that work on the main power supply system is being carried out on the train, place your Red Flag in accordance with SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres.

Position the Train in the Lift Shop	• Before moving a train into the lift shop ensure all pantographs are lowered correctly in accordance with SMS-06-SW-0838 Pantograph Raising and Lowering. • The correct positioning of the train is essential to prevent an incident or injury to persons. • Ensure the bogie or alternator to be removed is identified clearly to the lift shop supervisor to enable correct positioning of the affected car. • Always confirm communication is established between the shunters, observers and the lift shop supervisor before any train movement is attempted. • When positioning is completed chock the train to prevent movement.
Check	Visually inspect that the pantograph(s) has been lowered from the overhead power supply.
	***Warning*** *Ensure all pantographs are lowered in accordance with* SMS-06-SW-0838 Pantograph Raising and Lowering. ***Visually check*** *that the pantographs are lowered. Do not simply rely on the pantograph air pressure gauge, this will not guarantee that the pantographs are lowered. Failure to confirm that pantographs are lowered correctly may lead to serious* ***INJURY*** *or* ***DEATH****.*

Site/Job Planning	• Follow all worksite procedures, e.g. Inductions and pre-work briefings.
	• Ensure immediate environment is safe for work with regard to:
	  ◦ Adequate lighting.
	  ◦ Loose materials.
	  ◦ Chemical spills.
	  ◦ Housekeeping.
	  ◦ Slip, trip or fall hazards.
	• Ensure the road boom gates are lowered before any work commences, to prevent personnel being struck by moving vehicles.
	• Inspect the jacks, control panel and pit area for any damage or missing components. If any are found do not use the equipment - have an “Out of Service” tag fitted in accordance with SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out and notify your Line Manager as soon as practicable.
	• This task entails considerable heavy lifting throughout each stage of the process. Ensure that the load is assessed and a team lift approach is exercised. Refer to: SMS-06-GD-0001 Guide to Manual Handling.

Prepare the Drop Table	• Ensure the release road and pit area is clear of personnel and safety chains are in place. • Switch on the drop table control panel and ensure it is in the “table locked service road” configuration (see fig.1) Page 3 of 9. • Ensure the table is fully raised and all lock pins are engaged. • Check all jacking equipment is clear of the set and jack arms are fully retracted before any positioning of cars/sets takes place.

Example
Fig.1 Drop Table Control Panel

Position the Bogie

- Ensure all personnel are clear of the release road and pit area.
- Ensure all lock pins are engaged fully (see fig.2) Page 4 of 9.
- Position and immobilise the relevant bogie with chocks.
- Confirm that all electrical and pneumatic isolations have been carried.
- Carry out any disconnections in accordance with relevant technical documents, e.g. Engineering Instruction (EI) and SMS-06-SW-1248 Bogie System (02) Safe Working.

Example

Fig.2 Extended Lock Pin

Warning

Failure to correctly isolate all energy sources could result in serious injury or death. Always verify that isolation has been achieved and, if in doubt, seek assistance from your line manager. For generally purposes refer to: SMS-06-SW-0269 Electric Shock Protocol.

Position the supporting Jacks

- Ensure all personnel are clear of the release road and pit area.
- Position the supporting jacks and ensure they are checked by the supervisor to ensure correct engagement before continuing (see fig.3) Page 4 of 9.
- Extend the safety barriers at each jack.
- A red rotating beacon light will flash that indicates the jacks are in position, (see fig.8) Page 4of 9.

Example

Fig.3 Supporting Jack & Safety Barrier

Disconnect the Bogie

- Carry out work in accordance with referenced SWIs.
- The removal of components may require the use of the overhead travelling crane. Where this is the case ensure its use is in accordance with SMS-06-SW-1151 Overhead Travelling Crane - Safe. Operation.

Transfer the Bogie to the Release Road	• Ensure all personnel are clear of the release road and pit area. • Position observers at each jack. • If at any time during the drop, any person notices wear, damage or other signs of abnormal operation, immediately call out “STOP”. Cease work immediately and inform the lift shop supervisor so he can investigate and carry out the necessary corrective actions or isolations as required. • Trained operator to carry out lowering procedure followed by the transverse to the release road. • Raise at the release road and confirm that the locking pins are extended and the table locked light is illuminated (refer fig. 1), Page 3 of 8 and (fig. 2), Page P 4 of 9.
	**Warning** • *Failure to correctly immobilise (chock) the train or a removed bogie, could result in serious crush injury or death.* • *This step requires considerable manual handling. When moving the bogie or alternator trolley use the overhead travelling crane (competent operator) where possible or other mechanical devices. Apply a team lift approach where mechanical aids cannot be used. Refer to:* SMS-06-GD-0001 Guide to Manual Handling. • *Failure to ensure all persons are clear before lowering the drop table could result in serious injury or death.*
Prepare the Alternator Trolley	Position the drop table in the raised position at the release road. Check the alternator trolley as follows: • Ensure all personnel are clear of the release road and pit area. • Check and ensure brakes and gear drive operate correctly. • Check & inspect top table for any defects or damage. • Inspect the power supply cord for any damage. Refer to: SMS-16-SR-0057 Inspection and testing. • Carry out a test to ensure the scissor lift on the alternator trolley is working correctly. • For additional technical information see: HM-0024-QAP (Alternator Trolley).
	***Note*** *If the alternator trolley scissor lift is not lowered fully and secured correctly, before transferring to another road the drop table may become jammed causing a serious incident.*
	***Warning*** • *This step may expose you to various hazards. Ensure all work is carried out in accordance with* HM-0024-QAP (Alternator Trolley). • *Working in a maintenance pit exposes you to head strike and other potential injuries. Always wear a bump hat and work in accordance with* SMS-06-SW-0812 Working in the Pit *and* SMS-06-GD-0323 Personal Protective Equipment. • *To prevent an injury always ensure persons are clear and pit safety chains are in place before any movement of the drop table takes place.*

Transfer the Alternator Trolley to the Service Road

- Ensure all personnel are clear of the release road and pit area.
- Confirm the drop table is still in the locked position.
- Using a team lift approach to push the alternator trolley on to the drop table.
- Engage the gear drive and brakes and confirm they are fully engaged.
- Ensure all personnel are clear of the service road and pit area before lowering the drop table.
- Lower the drop table (Refer fig.5) Page 6 of 9.
- Traverse and raise it back to the Service Road.

Example

Fig.4 Alternator Trolley

Remove the Alternator from the Car

- Ensure all personnel are clear of the release road and pit area.
- Remove the safety chain and enter the pit.
- Connect the alternator trolley's power supply.
- Raise scissor lift until the alternator feet make contact with the table surface.
- Confirm all electrical circuits/terminals DO NOT have live power running through them before interacting with the alternators.
- Carry out required disconnections from the alternator.
- When ready ensure the alternator trolley is fully lowered.
- Engage the gear drive and brakes and confirm they are fully engaged.
- Disconnect the alternator trolley power supply.

Note

If the alternator trolley scissor lift is not lowered fully and secured correctly, before transferring to another road the drop table may become jammed causing a serious incident.

Connecting the alternator trolley's power supply isolates power to the drop table so it cannot be raised or lowered.

Transfer the Removed Alternator to the Release Road

- Ensure all personnel are clear of the release road and pit area.
- Position an observer to monitor the drop.
- If at any time during the drop, any person notices wear, damage or other signs of abnormal operation, immediately call out "STOP".
- The drop is to cease immediately and the lift Supervisor is to investigate and carry out the necessary corrective actions or isolations as required.
- Fitter to carry out lowering procedure followed by the transverse to the release road.
- Ensure that the release road is clear of personnel and equipment before raising the table.
- Raise at the release road and confirm that the locking pins are extended and the table locked light is illuminated (refer fig. 1), Page 3 of 9 and (fig. 2), Page 4 of 9.

Example

Fig. 5 Alternator in Position

Remove and Replace the Alternator from the Alternator Trolley	Remove the alternator from the alternator trolley in accordance with HM-0024-QAP (Alternator Trolley). The removal of components may require the use of the overhead travelling crane. Where this is the case ensure its use is in accordance with SMS-06-SW-1151 Overhead Travelling Crane - Safe Operation. Position the replacement alternator on the alternator trolley (see fig.5) Page 6 of 8.	
Carry out the Bogie Work	Carry out work in accordance referenced SWIs. The removal of components may require the use of the crane. Where this is the case ensure its use is in accordance with SMS-06-SW-1151 Overhead Travelling Crane - Safe Operation.	
Return the Bogie to the Service Road	• Ensure all personnel are clear of the release road and pit area. • Confirm the drop table is still in the locked position. • Using a team lift to push the serviceable bogie back on to the drop table • Chock the bogie. • Lower the bogie (Refer fig. 6) Page 7 of 9. • Traverse and raise it back to the service road. • Confirm the lock pins are extended before any work takes place.	 **Example** **Fig. 6 Bogie ready for lowering**
Transfer the Replacement Alternator to the Service Road	• Confirm the drop table is still in the locked position. • When fitting a replacement alternator, place it securely on the alternator trolley engaging the brakes and gear drive. • Ensure all personnel are clear of the service road and pit area before lowering the drop table. • Lower the drop table (Refer fig.5) Page 6 of 9. • Traverse and raise it back to the service road.	

Reconnect the Alternator

- Ensure all personnel are clear of the release road and pit area.
- Remove the safety chain and enter the pit.
- When fitting an alternator, connect electrical supply of the trolley and raise scissor lift to locate holes of the alternator brackets with train (see fig.7) Page 7 of 9.
- Carry out required reconnections to the unit being worked on keeping the alternator trolley raised until all connections are completed.
- Ensure that the alternator trolley's scissor lift mechanism is fully lowered.
- When ready, disconnect the Alternator Trolley's power lead.

Example

Fig.7 Alternator Trolley with Scissor Lift raised

Note

Ensure the alternator trolley electrical lead is secured before placing on the storage pallet and secure the trolley using the gear drive.

Warning

To prevent an incident or injury always wait until all the alternator bolts are installed and fully torqued before lowering and securing the alternator trolley.

Reconnect the Bogie

- Ensure all lock pins are engaged fully (see fig.2) Page 4of 9.
- Remove the safety chain and enter the pit.
- Reconnect the bogie as required.

Retract the Jacks

- When all bogie work is completed remove the wheel/bogie chocks.
- Exit the pit and replace the safety chain and retract the safety barriers at each jack.
- Ensure all jack arms are fully retracted clear of the set, (see Note and fig.8) Page 4of 9.
- Check all jacks for wear or damage.

Note

If the red rotating beacon light mounted on the top of either of the jacks is on, then either one or both of the jacks are still in position and will need to be retracted.

Example

Fig.8 Red Rotating Beacon Light

Remove the Alternator Trolley	• Ensure all personnel are clear of the release road and pit area. • Lower the alternator trolley. • Ensure the gear drive and brakes are engaged by manually moving the trolley, ensure a team lift approach. • Disconnect the alternator trolley power lead. • Transfer the empty alternator trolley to the release road using the drop table. • At the release road remove the alternator trolley and place on the storage pallet provided. Use mechanical lifting aids. • Return the pallet to its correct stowage location.
Clean Up	• Clean up any spills and remove tools, equipment and parts from work area. • Dispose of rubbish in waste disposal containers / bins. • Ensure all pit safety chains are replaced. • Check lifting gear after use, for any signs of wear or damage. • Notify of completion, as required. •
	**Warning** *Never stow or fail to report equipment that appears to be faulty, damaged or outside its inspection date, immediately tag it as 'Out of Service' in accordance with SMS-06-PR-0173 Plant and Equipment Lock-Out Tag-Out and inform your line manager as soon as practicable.*
Remove Red Flag	If you no longer need to work on or about the train, remove your red flag, in accordance with SMS-12-OI-0886 Red Flagging Trains in stabling yards, depots and Maintenance Centres before leaving the train.

Additional controls
Additional controls may be required, depending on the work being carried out. Always refer to relevant SWIs and seek advice from the relevant line manager, if required.