Removing and Rerailing Vehicles from Tracks

Document no.

SMS-06-SW-0931

Work description

This SWI outlines the safe work practices for removing a vehicle from tracks or replacing a vehicle back on to tracks at a derailment site.

Scope

This SWI applies to all rail vehicle removals and replacements onto or off of tracks carried out by Rail Emergency Train Recovery Unit (RETRU).

Review date

14/07/13

References

- OHS Act 2000
- OHS Regulation 2001
- Rail Safety Act 2008
- Network Rules 414
- SMS-06-SW-0932 Pony Bogie-Safe Fitting
- SMS-06-PR-0329 Hot work
- SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out
- SMS-06-GD-0001 Guide to Manual Handling
- SMS-06-GD-0323 Personal Protective Equipment
- SMS-16-SR-0057 Inspection and testing
- SMS-05-SR-0027 Records management
- SMS-06-SW-0944 Vehicle Loading Crane
- SMS-06-SW-0487 Entering Trains from Ballast
- SMS-06-SW-0488 Climbing out of Trains onto Ballast
- SMS-06-SW-0838 Pantograph Raising and Lowering
- SMS-06-GD-0268 Working Around Electrical Equipment
- SMS-06-FM-0582 Electrical Permit to Work
- SMS-11-GD-0244 Personnel Certifications – Electrical Authorisations
- SMS-06-SW-0839 Compressed Air - Safe Use
- SMS-06-PR-0104 Workplace Risk Management.

Responsible supervisor	PPE and precautions	Competencies or qualifications	Licences or permits required
Line Manager	• High visibility clothing and or vest • Sun safe clothing, as required • Safety eyewear • Protective gloves • Hearing protection, as required • Protective full length overalls • Knee pads, as required • Steel capped, lace up safety boots • Sunscreen, as required • Insect repellent, as required • Bump hat, when working under vehicles • Hard Hat, when on construction sites • Appropriate respiratory protection, during hot work	• Rail Industry Safety Induction (RISI) • Manual handling training • Implement Control Signal Blocking (CSB) and No Authority Required (NAR) (Supervisor) • General Induction for Construction Work in NSW (Green Card) • Network Rollingstock Maintainer (NRM) • Competent in the use of this SWI	• Hot Work permit as required

Tools and equipment required

- Hand tools
- Portable lighting
- Hydraulic oil displacement jacks 120, 90, 60, 12 and 6 tonne
- Hydraulic line control consol
- Hydraulic pump
- Hydraulic lines
- 3.3 metre traversing beams
- Wooden chocks
- Timber blocks

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 pre-work brief and task risk assessment is undertaken and documented with all team members involved in the work activity. If any new/additional team members arrive any time later they must be briefed before they commence work. If the work process has to change from the process originally briefed to the team, stop work re-assess any all/risks and re-brief the team.
- Ensure all team members have been briefed on the site protection measures.

Warning

The following warnings apply throughout this SWI:

- *Failure to comply with these procedures could result in serious injury, electrocution, damage to property, or the failure of RailCorp services, power, and signalling or communication systems.*
- *The determination that the status of the 1500 Volt overhead wiring is dead is only to be made by an Authorised Traction Live Line Worker or an Authorised Officer (Mains). If you are unable to confirm the status always assume it is live, refer to:* SMS-11-GD-0244 Personnel Certifications – Electrical Authorisations.
- *The jacking of vehicles presents a serious entrapment hazard. Under no circumstances are you to place any part of your body near or under moving equipment, to do so could result in serious injury or death. Therefore employees involved with jacking activities should have a clearly identified escape path in the event of an unexpected jack/train movement.*
- *Whenever "Stop" is called out by any person carrying out this procedure all work must cease immediately. Investigate as to why "Stop" was called. No work is to proceed until the "All clear" is given by the Rail Emergency Train Recovery Unit (RETRU) supervisor.*
- *This task requires considerable manual handling. Where possible use manual handling aids and/or seek assistance. Use a firm grip, keep back straight, bend knees and avoid twisting, bending or overreaching as per manual handling training, refer to:* SMS-06-GD-0001 Guide to Manual Handling.
- *This task may be conducted on uneven surfaces (such as ballast) that represent slip, trip and fall hazards. Use Hazard controls in accordance with* SMS-06-SW-0487 Entering Trains from Ballast *and* SMS-06-SW-0488 Climbing out of Trains onto Ballast
- *Working under trains may have head strike hazards. To prevent injury wear head protection and where necessary place padding over sharp protrusions, refer to:* SMS-06-GD-0323 Personal Protective Equipment.

Warning

- *If any equipment is damaged do not use it. Tag the equipment out, in accordance with SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out, and notify your Line Manager as soon as practicable.*
- *Look out for dangerous fauna such as snakes and spiders especially when working in the warmer months in remote areas. Failure to thoroughly check the immediate environment for hazards could lead to serious injury or death.*
- *All non-essential rail personnel and members of the public must be kept at least 10 metres clear of the work location.*
- *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**.*

Note

- The nature of the work outlined in this SWI requires a considerable amount of heavy equipment to be moved manually from a truck to a rail track. Therefore refer to: SMS-06-GD-0001 Guide to Manual Handling

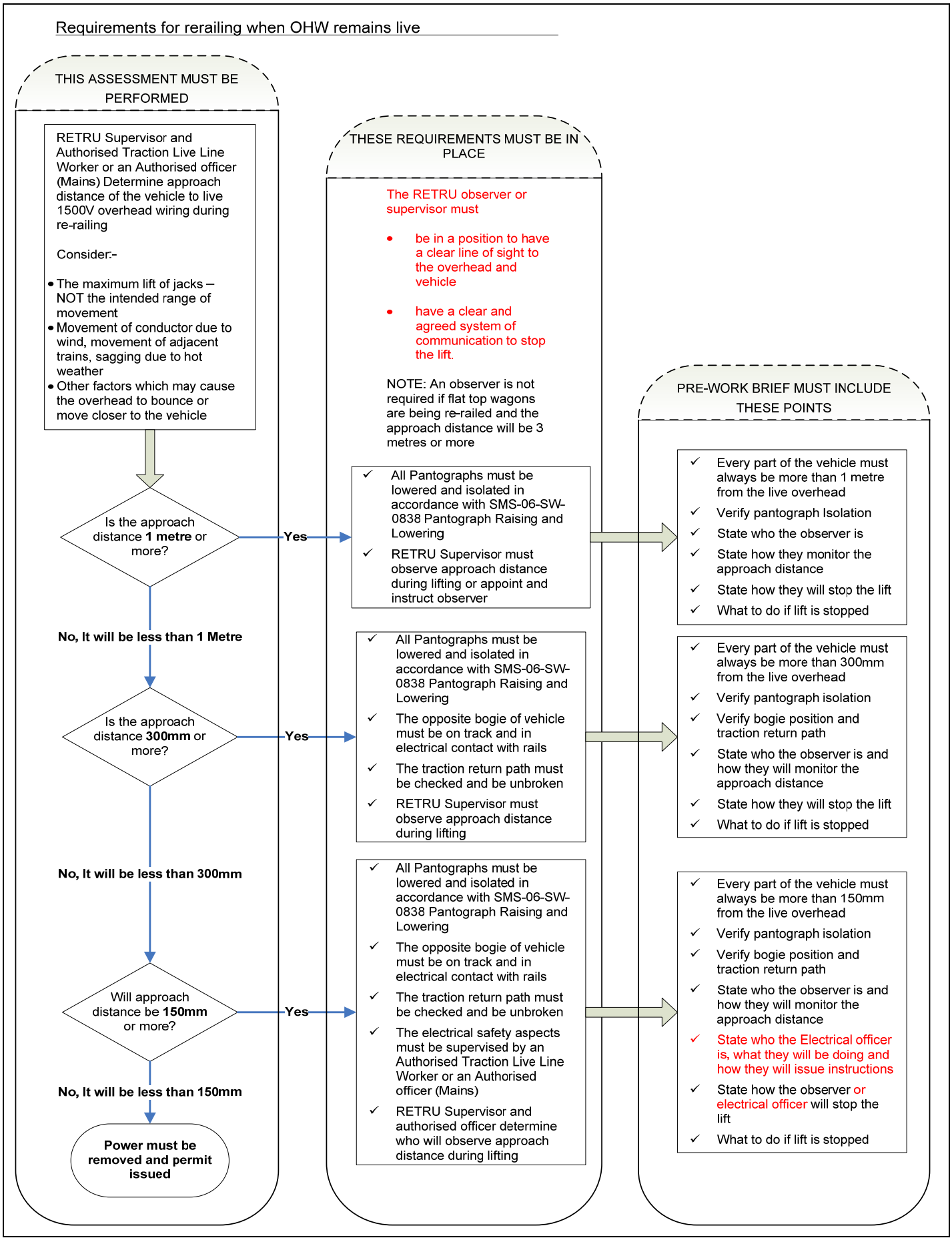
Always comply with the following minimum requirements in addition to other directives in this SWI:

- Always park the RETRU vehicle as close as possible to the rail vehicle being worked on, to minimise equipment carrying distances.
- Use lifting aids when moving equipment.
- Use assistance by way of team lift when moving equipment.
- When lifting, use a minimum of:
  - 2 persons for all Jacks.
  - 4 persons for the motor pump unit and the reservoir unit.
  - 6 persons for all beams.
- Any lifting gear found to be worn, damaged or outside its periodic inspection date during is to be fitted with an out-of service tag, in accordance with SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out. Such tagged gear is not to be re-used until certified as fit for use by an approved provider.
- It may be necessary to fill surface depressions and potholes or place mats or other artificial surfaces to prevent pick and carry cranes from tilting whilst travelling.
- Maintain inspection and test records in accordance with and SMS-05-SR-0027 Records management

Warning

To prevent equipment failure before using any type of lifting gear, always ensure that the lifting gear has had a visual inspection and has been certified as fit for use and is within its inspection date.

Job/Site planning	Follow all worksite procedures, e.g. Inductions and pre-work briefings. • Ensure a pre-work brief is undertaken and documented with all team members involved in the work activity. If any new/additional team members arrive at a time they must be briefed before commencing work. If the work process has to change from the process originally briefed to the team stop work re-assess any all risks and re-brief the team. Ensure all team members have been briefed on the site protection measures. • Determine if the incident you are attending involves vehicles containing hazardous goods or dangerous substances. If the incident involves rail vehicles carrying dangerous goods or hazardous substances, do not proceed until the "All Clear" is given by the NSW Fire Brigade HAZMAT unit. • Inspect the immediate environment to ensure it is safe for work e.g. inadequate lighting, loose materials, chemical spills, housekeeping, sharps, glass and dangerous fauna. • Ensure the path to the work site is clear of any slip, trip and fall hazards before moving any equipment. • Inspect the vehicle(s) to be rerailed to determine if there is broken earth return axle straps or other exposed electrical conductors. • Ensure there are safe escape paths for employees in the event of any unexpected jacking/train movement. • Ensure all team members have the correct PPE for the task(s) to be undertaken.
	**Note** PPE must be maintained correctly and in good condition. Users are to inspect PPE for: • Signs of deterioration, cracks or distortion. • Excessive scratches (on eyewear). • Missing/damaged components. • Expiry date. • Always use PPE in accordance with SMS-06-GD-0323 Personal Protective Equipment.
Determining the Criteria for Isolation of the 1500 volt Overhead	• The RETRU Supervisor must consult with the Authorised Traction Live Line Worker or an Authorised Officer (Mains) on site to determine if the 1500 Volt Overheard Wiring is to be isolated before any work can commence, refer to: SMS-11-GD-0244 Personnel Certifications – Electrical Authorisations. • Whenever practicable, overhead wiring is to be isolated and re-railing performed under an electrical permit. Where isolation is not practicable, an assessment must be conducted and work performed in accordance with requirements for re-railing when OHW remains live. Situations that require electrical permits SMS-06-FM-0582 Electrical Permit to Work are specified in Section 7.1 of SMS-06-GD-0268 Working Around Electrical Equipment document.
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****.*


Requirements for rerailing when OHW remains live
THIS ASSESSMENT MUST BE PERFORMED
RETRU Supervisor and Authorised Traction Live Line Worker or an Authorised officer (Mains) Determine approach distance of the vehicle to live 1500V overhead wiring during re-railing
Consider:-
• The maximum lift of jacks – NOT the intended range of movement
• Movement of conductor due to wind, movement of adjacent trains, sagging due to hot weather
• Other factors which may cause the overhead to bounce or move closer to the vehicle
Is the approach distance 1 metre or more?
Yes
No, It will be less than 1 Metre
Is the approach distance 300mm or more?
Yes
No, It will be less than 300mm
Will approach distance be 150mm or more?
Yes
No, It will be less than 150mm
Power must be removed and permit issued
THESE REQUIREMENTS MUST BE IN PLACE
The RETRU observer or supervisor must
• be in a position to have a clear line of sight to the overhead and vehicle
• have a clear and agreed system of communication to stop the lift.
NOTE: An observer is not required if flat top wagons are being re-railed and the approach distance will be 3 metres or more
✓ All Pantographs must be lowered and isolated in accordance with SMS-06-SW-0838 Pantograph Raising and Lowering
✓ RETRU Supervisor must observe approach distance during lifting or appoint and instruct observer
✓ All Pantographs must be lowered and isolated in accordance with SMS-06-SW-0838 Pantograph Raising and Lowering
✓ The opposite bogie of vehicle must be on track and in electrical contact with rails
✓ The traction return path must be checked and be unbroken
✓ RETRU Supervisor must observe approach distance during lifting
✓ All Pantographs must be lowered and isolated in accordance with SMS-06-SW-0838 Pantograph Raising and Lowering
✓ The opposite bogie of vehicle must be on track and in electrical contact with rails
✓ The traction return path must be checked and be unbroken
✓ The electrical safety aspects must be supervised by an Authorised Traction Live Line Worker or an Authorised officer (Mains)
✓ RETRU Supervisor and authorised officer determine who will observe approach distance during lifting
PRE-WORK BRIEF MUST INCLUDE THESE POINTS
✓ Every part of the vehicle must always be more than 1 metre from the live overhead
✓ Verify pantograph Isolation
✓ State who the observer is
✓ State how they monitor the approach distance
✓ State how they will stop the lift
✓ What to do if lift is stopped
✓ Every part of the vehicle must always be more than 300mm from the live overhead
✓ Verify pantograph isolation
✓ Verify bogie position and traction return path
✓ State who the observer is and how they will monitor the approach distance
✓ State how they will stop the lift
✓ What to do if lift is stopped
✓ Every part of the vehicle must always be more than 150mm from the live overhead
✓ Verify pantograph isolation
✓ Verify bogie position and traction return path
✓ State who the observer is and how they will monitor the approach distance
✓ State who the Electrical officer is, what they will be doing and how they will issue instructions
✓ State how the observer or electrical officer will stop the lift
✓ What to do if lift is stopped

Prepare the Vehicle

- Ensure all team members have been briefed on the site protection measures.
- Chock the bogie wheels of the wagon or vehicle to be worked on with the designated chocks

The Supervisor is to check that:

  - Park brake is engaged wherever possible.
  - The vehicle is secured and chocked before any lifting task is attempted.
  - The bogie is fixed to the vehicle. If not, secure the bogie to the vehicle with chains sufficient to prevent the separation of bogie and vehicle during the fitting of the pony bogies.

- Before jacking any vehicle, inspect all wooden chocks, hydraulic jacks, hydraulic hoses and fittings, the air compressor, pneumatic hoses and the vehicle loading crane for any damage or leaks. Maintain inspection and test records in accordance with and SMS-05-SR-0027 Records management. Ensure Lock-out, tag-out procedures are undertaken refer to: SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out

Note

- When the 1500 Volt Overhead Wiring is required to be isolated an Electrical permit to work is to be issued by the Authorised Traction Live Line Worker or an Authorised Officer (Mains) and must be signed by all persons working on the site*, refer to:* SMS-11-GD-0244 Personnel Certifications – Electrical Authorisations.
- When both ends of the wagon or bogie are derailed, the wheels at the end **NOT** being worked on must be chocked.
- If freight wagon king and queen castings have become separated by the incident, they must be realigned or made safe before proceeding further.

Warning

- *Failure to securely chock the wheels or engage the park break may result in movement of the vehicle leading to serious injury or death.*
- *Failure to inspect all wooden chocks, hydraulic jacks, hydraulic hoses and fittings, the air compressor, pneumatic hoses and the vehicle loading crane for any damage or leaks, may cause equipment failure resulting in serious injury or death. Refer to:* SMS-06-SW-0839 Compressed Air - Safe Use

Unload and position lifting equipment

- Start the air compressor and check for leaks or malfunctions.
- Unload the jacking equipment selected by the supervisor refer: SMS-06-SW-0944 Vehicle Loading Crane
- Inspect all equipment for damage or leaks before use.
- Ensure the equipment does not have any “out of service tags” and that the equipment is within it’s maintenance test date.
- Remove the required hydraulic hoses and other equipment with assistance as required.
- Confirm the path to the work site is free of any slip, trip and fall hazards.
- Switch off the truck air compressor when equipment unloading is completed.
- The two (2) separated units can then be transported to the work site, using the special cradle that is in the truck, in accordance with the manual handling note above.

	**Note** If the hydraulic pump unit is required to be carried a reasonable distance then the motor and pump section must first be separated from the hydraulic oil reservoir section.
	***Warning*** • *Keep all parts of the body clear of suspended loads and clear the intended travel path of any trip hazards before lifting and moving any equipment.* • *Keep fingers clear of cables when operating the vehicle loading crane.* • *High pressure air may penetrate the skin causing **air bubbles to form in the blood stream** resulting in seriously injury and/or death, ensure you always wear eye and hearing protection as well as protective clothing. For the purpose of PPE, refer to:* SMS-06-GD-0323 Personal Protective Equipment. *With reference to high pressure air and general use refer to:* SMS-06-SW-0839 Compressed Air - Safe Use. • *The compressor is noisy. Always wear hearing protection to prevent hearing damage. Refer to:* SMS-06-SW-0839 Compressed Air - Safe Use.
Preparing for the Lift	• The Supervisor is to check by way of visual confirmation that all pantographs are lowered on all vehicles and confirm with the **Electrical Systems Operator** that all requirements for lifting under the overhead remains in place. • Chock the wheels of the vehicle to be worked on as determined by the supervisor. Apply the handbrake wherever possible. • The supervisor will select the traverse beam trolley and hydraulic jacks necessary for a safe lift. • Select the packing timber for use and, position safely where required to stabilise traversing beam. • Check and securely connect all hydraulic hoses to their correct receptacles. • The supervisor will undertake an inspection to ensure that the traversing beam and traversing trolley are positioned correctly and safely under rail vehicle. • Place the selected jack on the trolley in preparation for the lift. • Check that the vehicle is secured with chocks.
	**Note** • It may be required to do an initial lift on a lifting point selected by the supervisor to give enough clearance to safely place the main lifting jack into the selected position. • When dealing with a locomotive initial lift, extra steps are mandated due to the considerable weight involved. • Jacks must be placed on each side of locomotive on lifting points selected by the supervisor to enable a safe lift to be achieved.

	**Note** Should any hot work be required, a risk assessment must be carried out and all permits and authorities gained before any work is commenced in accordance with SMS-06-PR-0329 Hot work
	***Warning*** • *A minimum of 6 people are required to carry the traversing beam whenever it needs to be moved.* • *Never use hydraulic equipment which is found to be leaking. Hydraulic fluid that escapes under pressure can blind personnel or penetrate the skin causing serious injury or loss of a body part due to poisoning and even cause death. Tag-out any hydraulic equipment found leaking or faulty and report to your supervisor, refer to:* SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out
Traversing the damaged vehicle	• The supervisor or nominated observer is to ensure that the safe approach distance for the lift is not encroached during this operation. • When the vehicle is lifted high enough, traverse the vehicle in the required direction to align the wheels with rail track, using the 12 and or 6 tonne displacement jack. • When the vehicles wheels are aligned to the track, commence lowering. • Ensure that bogie centres and kingpins are in alignment when lowering is completed.
	**Note** An extra lift may be required with another jack positioned at a lifting point selected by the supervisor. This is to allow sufficient clearance for the safe removal of a main jack, rail trolley or traversing beam before final lowering of the vehicle to the track.
	***Warning*** • *If an extra lift is required the RETRU supervisor must confirm that the approach distance to live overhead wiring will not be encroached.* • *The hydraulic control consol operator must have a clear view of the whole process at all times, the operator is to immediately stop all operations should line of sight be lost. Failure to comply may result in serious injury or death.*
Re-positioning the damaged vehicle	• Once the vehicle is finally positioned on the tracks and the lifting gear has been removed. Apply the vehicle's handbrake and remove all chocks. • If the handbrake is inoperable, ensure the chocks remain in place. • Should the vehicle operator's representative not be present to give direction on repairs then the supervisor is to fill out either a **Green** or a NOT TO GO card ('**red card**') detailing all faults found and also a "No Brake Tag" if the vehicle has a defective handbrake. Generally *refer to:* SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out

	***Warning*** • *Failure to secure a vehicle with defective brake gear with chocks after completion of all work could lead to serious injury or death, as unexpected vehicle movement can occur.* • *Failure to secure handbrake fully, before removing chocks could lead to serious injury or death, as unexpected movement can occur.*
Equipment Removal and Housekeeping	• Turn off the hydraulic pump. • Depressurise the hydraulic lines by operating the levers on the control consol. • Disconnect all hydraulic hoses and refit all protective caps. • Separate the pump motor unit from the hydraulic oil unit before transporting it. • Transport all of the equipment back to the truck, using assistance and manual handling aids work in accordance with manual handling training, refer to: SMS-06-GD-0001 Guide to Manual Handling • Restart the compressor and check for leaks or malfunctions. • Return all of the equipment back to its correct storage position and secure correctly, using the vehicle loading crane SMS-06-SW-0944 Vehicle Loading Crane with assistance as directed by the supervisor. • Shut down the compressor and secure the vehicle loading crane. • Check the work area is clear of all equipment and tools and all rubbish is removed. • Conduct a post work inspection for any damage that may have occurred to equipment during its use. If any equipment is damaged do not use it. Tag the equipment out, in accordance with SMS-06-PR-0173 Plant and Equipment Lock-out Tag-out, and notify your Line Manager as soon as practicable.
	***Warning*** • *Always wear protective gloves during clean up to prevent hand injury.* • *Keep fingers clear of cables when operating the vehicle loading crane.*
Notify	Notify the Line manager and Network Operations upon completion of task.

Additional Controls

If you identify additional hazards and / or controls relevant to this SWI, notify your Line Manager as soon as practicable, so they can be noted and used to continuously improve this document.

Other controls may be necessary, depending upon the work being carried out. Refer to relevant SWIs.