



SYDNEY TRAMWAY MUSEUM

TRACK MAINTENANCE PROCEDURES

JULY 2010

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Document Control Record

1. Document Details:

Name: TRACK MAINTENANCE PROCEDURES
Number: STM6176
Version Number: 1.0

Document Status: Working Draft
 Approved for Issue
 Archived

Next Scheduled Review Date: _____

2. Version History:

Version Number	Date	Reason/Comments
1.0	31/07/2010	Initial issue

Approved by _____ **Signature & Date** _____

3. Distribution List

Position	Date	Copy Issued to (Yes/No)	Copy No.	Received
Rail Safety Manager		Y	1	

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1. Purpose

The purpose of this procedure is to describe the processes for doing the various track maintenance procedures.

2. Scope

This procedure shall apply to track work carried out at the Sydney Tramway Museum.

3. References

STM6024 – Tramway Track Standards

4. Definitions

Dunnage – is a term for off-cut or spare pieces of scrap wood.

Huck – is a structural Blind Bolt.

Podger – is a tool in the form of a short bar, usually tapered.

PPE – Personal Protective Equipment.

STM – Sydney Tramway Museum

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6. Rail Track Components

6.1 TANGENT TRACK

- Rails
- Sleepers - wood, steel & concrete
- Fishplates
- Huck bolts
- Dog spikes
- Clips
- Pandrol plates - cantered & flat
- Ballast
- W.T.F or Abutment timbers

6.2 TURNOUTS

- Stock rails - straight & curved
- Switch (point) blades - straight & curved
- Standard tramway type cast integrated point blade units
- Check rail assembly - straight & curved
- Crossing - left or right hand
- Point stand - hold down, type 45, ground lever
- Point rods
- Timbers - from 2.9m to 6.3m, wood or concrete
- Heel fishplate & washer plate
- Chairs for switch (point) area
- Dog spikes, standard length and longer length point chair spikes
- Composite fishplates
- Distance pins & bolts
- Points protector
- Clips

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7. Change A Wooden Sleeper

7.1 INTRODUCTION.

Wooden sleepers become rotten over a period of time and need to be changed. On straight track it is recommended that 1 in 4 sleepers are in good condition and on curved track, 1 in 3 sleepers are in good condition.

7.2 SECURE THE SITE.

Close and secure the section of track to be worked on.

7.3 PREPARE WORK AREA.

7.3.1 If required, clean off any excessive ballast or dirt with a shovel.

7.3.2 Using picks and shovels, clean around fastening and sleeper.

7.3.3 Using a shovel, dig a channel at the end of the sleeper that is to be removed.

7.4 CHANGE A WOODEN SLEEPER.

7.4.1 Remove dog spikes with dog spike puller.

7.4.2 Place 2 jacks under rails close to the sleeper that is to be removed and lift up rails.

7.4.3 With the use of sleeper tongs and 4 men, pull out the sleeper towards the channel.

7.4.4 With a shovel, clean out the bay where the sleeper was removed.

7.5 INSTALL THE NEW SLEEPER.

7.5.1 With the new sleeper and 4 men, install the new sleeper by moving it into the space where the old sleeper came from.

7.5.2 Make sure that all personnel are clear of the rails and then drop the jacks.

7.6 ATTACH THE NEW SLEEPER TO EACH RAIL.

7.6.1 Using 1 or 2 bars, lift up the sleeper so that it is flush with the foot of the rail.

7.6.2 Check the gauge.

7.6.3 Drill the sleeper for the dog spikes.

7.6.4 Use the dunnage and crow bars to support the sleeper, tap in the dog spikes in approximately 25mm and then drive the lock spike home.

7.6.5 Remove the dunnage and crow bars from underneath both rails.

7.6.6 With shovels or tampering tools, pack underneath the sleeper.

7.6.7 Check that the gauge between the rail heads is 1435mm or greater (see STM6024 Tramway Track Standards – Table 1 Structure Gauge for the correct gauge specifications).

7.6.8 If it is required, move the rail in or out to get the required gauge.

7.7 COMPLETE THE JOB.

7.7.1 Leave the area in a clean and tidy condition.

7.7.2 Reopen the track.

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8. Change A Sleeper In A Turnout (Points)

8.1 INTRODUCTION.

Because of their complexity it is more likely that a derailment will occur on a turnout rather than tangent track. In order to keep them operating to their design specification it is necessary to renew some of the components comprising a turnout such as the timbers.

8.2 SECURE THE SITE.

Close and secure the section of track to be worked on.

8.3 REMOVE THE OLD TIMBER.

8.3.1 See Section 6.3 and 6.4 (*Change A Wooden Sleeper*) above.

8.4 REPLACE THE TIMBER.

8.4.1 Position the new timber under the rails.

Note 1: It is mandatory that eight men equipped with tongs are used to lift a timber.

Note 2: Ensure that the larger growth rings visible on the cut end of the timber are facing upwards

8.4.2 Use jacks or bars to raise and hold one end of the timber against the foot of the rail.

8.4.3 Check that the gauge.

8.4.4 Drill holes in the timber close to the foot of the rail.

8.4.5 Use bars or jacks to support the other end.

8.4.6 Drill holes in the timber close to the foot of the rail.

8.4.7 With shovels, pack underneath the sleeper.

8.4.8 Check that the gauge again.

8.5 COMPLETE THE JOB.

8.5.1 Leave the area in a clean and tidy condition.

8.5.2 Reopen the track.

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9. Change A Broken Fishplate

9.1 DEFINITION.

Fishplate - Is a length of steel with six holes, profiled to fit snugly between the head and the flange of the rail and are used in pairs to join lengths of rail together.

9.2 INTRODUCTION.

Fishplates can fracture in service. While one broken fishplate will not of itself cause a derailment, it can add to the risk if for other reasons one of the rails at the join is allowed excessive movement. Therefore, broken fishplates should be replaced as soon as possible.

9.3 SECURE THE SITE.

Close and secure the section of track to be worked on.

9.4 REPLACE THE TIMBER.

9.4.1 Isolate the track.

9.4.2 Clear around both sides of the fishplates down to sleeper level.

9.4.3 Clean the bolts securing the fishplates.

9.4.4 Undo the bolts or use oxy acetylene to cut the bolts and collars off level with the fishplate if they cannot be undone.

Note: Personal protective equipment must be worn when oxy acetylene is used.

9.4.5 Knock out the bolts with the podger and hammer.

9.4.6 Use a sledge hammer to remove the fishplates from the rails

9.5 FIT NEW FISHPLATE.

9.5.1 Clean ends of both rails both sides where fishplates sit.

9.5.2 If any of the old fishplates are reusable, clean the old fishplates.

9.5.3 Fit two fishplates to the rails.

Note: Ensure that the new fishplate(s) is the appropriate type.

9.5.4 Fit 4 new fishplate bolts and collars (and washers if appropriate).

Note 1: Leave the holes adjacent to the ends of the rails vacant.

Note 2: Insert bolts from the four foot to the six foot.

9.5.5 Tighten the bolt completely at the opposite end of the fishplate.

9.5.6 Tighten the remaining bolts in order including the first bolt.

9.6 COMPLETE THE JOB.

9.6.1 Leave the area in a clean and tidy condition.

9.6.2 Reopen the track.

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10. Change A Length Of Rail

10.1 INTRODUCTION.

A length of rail can be changed due to:

- i. Worn rail
- ii. Broken rail
- iii. Upgrading of rail track.

The changing of rails requires that the section of rail track be isolated or closed at all times.

10.2 SECURE THE SITE.

Close and secure the section of track to be worked on.

10.3 PREPARE THE AREA TO REMOVE THE RAIL.

10.3.1 Clean around the rail and fastenings (backhoe may be required).

10.3.2 Using a pick and shovel, clean around fish plates and bolts.

10.4 REMOVE THE RAIL.

10.4.1 Either undo or cut fish plate bolts with oxy.

Note: Personal protective equipment must be worn when oxy acetylene is used.

10.4.2 Remove bolts and fish plates using a podger and a 14lb sledge hammer.

10.4.3 Remove the dog spikes along the rail to be replaced.

10.4.4 Remove rail by whatever means required (i.e. manually or by machine).

10.5 REPLACE THE RAIL.

10.5.1 Check to see if new rail is correct length.

10.5.2 If the new rail is NOT the correct length:

- i. Using a rail saw (disc), cut the new rail to the length of the old rail; and
- ii. Drill fish plate holes at the ends.

10.5.3 Install new rail in track by using manual or mechanical means.

10.5.4 Replace both pairs of fish plates.

10.5.5 Replace all dog spikes.

10.5.6 Check that the gauge between the rail heads is 1435mm.

10.6 COMPLETE THE JOB.

10.6.1 Leave the area in a clean and tidy condition.

10.6.2 Reopen the track.

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11. Change A Check Rail Assembly

11.1 DEFINITION.

Check Rail Assembly - Consists of a rail (called the check running rail) attached to the inside of which is a short length of rail (called the check rail) which positively locates the wheel on that side so that the wheel on the opposite end of the axle does not impact on the nose of the crossing as the turnout is traversed from front to back.

Also it should be noted that tramways with sharper curves use check rails on all curves less than 71 m (200 foot) radius. Flange-way widths and over-gauge allowances to be as per the *STM Tramway Track Standards (STM5024) – Table 3.*

11.2 INTRODUCTION:

Turnouts generally have two check rail assemblies which are always located opposite the crossing (frog). The gap between the check rail and the check running rail can become too wide for a number of reasons such as the gap filling with debris which in turn may cause huck bolt failure. If this condition is not rectified a derailment will probably occur.

11.3 SECURE THE SITE.

Close and secure the section of track to be worked on.

11.4 REMOVE THE WORN/DAMAGED ASSEMBLY.

11.4.1 Clean both sides of the check rail assembly.

11.4.2 Remove all the dog spikes securing the assembly.

11.4.3 Oxy-cut the huck bolts at both ends of the assembly.

Note: Personal protective equipment must be worn when oxy acetylene is used.

11.4.4 Use a crane or other means to lift out the assembly.

11.4.5 Clean and/or replace the fish plates as required.

11.5 POSITION THE NEW ASSEMBLY.

11.5.1 Clean the base plates and between the sleepers and timbers as required.

11.5.2 Use a crane or other means to lift in position the new assembly.

11.5.3 Replace the fish plates and huck the bolts.

11.5.4 Replace the dog spikes.

11.6 COMPLETE THE JOB.

11.6.1 Leave the area in a clean and tidy condition.

Note: If, after completion of the job the turnout is tamped, any residual ballast must be removed from between the check running rails and the check rails.

11.6.2 Re-open the track

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12. Change A Point Blade

12.1 INTRODUCTION:

Point or switch blades are the most critical components in a turnout and are subject to severe wear. Before commencing work the stock rail adjacent to the worn or damaged point blade should be carefully examined for wear.

STM use either cast blade units or the standard NSW Government Tramways type points fabricated from T rails which use bolts and pipe spacers – see *STM6024 Tramway Track Standards – section 10.13 Points*.

12.2 SECURE THE SITE.

Close and secure the section of track to be worked on.

12.3 REMOVE THE WORN POINT BLADE.

12.3.1 Remove the points stand cover.

12.3.2 Undo or oxy cut the bolts which secure the switch blade to the drag rods.

Note: Personal protective equipment must be worn when oxy acetylene is used

12.3.3 Undo or oxy cut the four bolts which secure the switch blade to the lead rail.

12.3.4 Use the podger, if necessary to knock out the bolts, and then clean the heel fish plate and the heel washer plate.

12.3.5 Use a crane or forklift to lift out the switch blade.

12.3.6 Clean the timbers, chairs and stock rail where the switch blade fits.

12.3.7 Check the distance pins, replace and tighten as required.

12.4 FIT THE REPLACEMENT POINT BLADE

12.4.1 Select the appropriate replacement point blade.

Note: Point blade can be:

- of various rail sizes;
- left or right hand turnout;
- left or right point blade; and
- undercut or standard point blade.

12.4.2 Use a crane or forklift to lift the point blade into position.

12.4.3 Replace the plates, all the bolts and tighten.

Note: The heel fish plate goes to the inside and the washer plate to the outside. The heel bolts and collars are used to fix the point blade and the heel fish bolts through the lead rail. **DO NOT OVERTIGHTEN THE HEEL BOLTS AND COLLARS.**

12.4.4 Check the operation of the points.

Note: Grease if necessary.

12.5 COMPLETE THE JOB.

12.5.1 Leave the area in a clean and tidy condition.

12.5.2 Reopen the track.

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13. Regauge a Section of Track

13.1 DEFINITION.

Gauge - The gauge is the distance between the two running faces of the rail heads comprising a rail track and should be 1435mm.

13.2 INTRODUCTION:

Rail tracks get out of gauge because of wear in the wooden sleepers where the rails are secured by spikes. This happens on curves when the centrifugal forces exerted by the rail traffic cause the high rail to move and also on tangent track where movement of either rail may cause the track to be out of gauge. If the track is out of gauge because of movement of both rails then it is usual to replace the sleepers.

13.3 SECURE THE SITE.

Close and secure the section of track to be worked on.

13.4 PREPARE THE TRACK FOR REGAUGING.

13.4.1 Clean the track down to sleeper level with the pick and shovel.

13.4.2 Choose the rail to be repositioned.

13.4.3 Remove the dog spikes on both sides of the chosen rail.

13.4.4 Check if the sleeper needs to be replaced.

13.4.5 If so replace the sleeper – see Section 6 – Change A Wooden Sleeper.

13.5 RELOCATE THE RAIL.

13.5.1 Pull or push the rail to the correct gauge with the rail puller or other means.

13.5.2 Drill the sleeper so as to drill 2 fresh holes for the dog spikes.

13.5.3 Spike the dog spike to the outside side of the rail.

Note: Ensure the spikes are tapped into position before they are driven home. Flying spikes can cause serious injury.

13.5.4 Check the track at every third sleeper to see if it needs to be regauged. If so return to step 12.5.1 above.

13.5.5 Spike the dog spike to the inside of the rail.

13.6 COMPLETE THE JOB.

13.6.1 Leave the area in a clean and tidy condition.

13.6.2 Reopen the track.

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14. Transpose A Section Of NON WELDED Rail Track

14.1 INTRODUCTION:

Rails wear in use on the running face of the head. On straight sections of track the rail head is subject to tangent flow and on curves the high rail sustains gauge face wear. In order to extend the life of the track by maximising the wear on both rails, it is common practice to transpose or swap the rails. On straight sections of track this transposition is simple, but on curves the high rail will have to be shortened and the inside rail will need to be lengthened.

NOTE: Transposing a section of WELDED rail requires more equipment than the Museum possesses so for this to be completed; a professional organisation would need to be employed.

14.2 SECURE THE SITE.

Close and secure the section of track to be worked on.

14.3 PREPARE THE RAILS FOR TRANSPOSITION.

14.3.1 Clean the track down to sleeper level.

14.3.2 Undo or oxy cut all the huck bolts at the ends of the section of track to be transposed.

Note: Personal protective equipment must be worn when oxy acetylene is used.

14.3.3 Oxy cut any loose huck bolts on the section.

14.3.4 Remove all the dog spikes securing both rails.

14.4 TRANSPPOSE AND RESECURE THE RAILS.

14.4.1 Use a crane or other mechanical means to swap the rails.

14.4.2 If the transposed rails do NOT fit exactly, use the rail saw to cut the “too long” rail to suit.

14.4.3 Use the rail saw to cut the “too short” rail so that a 6m length of rail will be accepted.

14.4.4 If holes need to be drilled to accept fishplates, drill rails to accept fishplates where necessary – see Section 16 -*Mark Drill Points On Rails To Accept Fishplates.*

14.4.5 Fit fishplates and huck the bolts.

14.4.6 Replace and huck any loose bolts previously cut off.

14.4.7 Replace the dog spikes on both rails.

14.5 COMPLETE THE JOB.

14.5.1 Leave the area in a clean and tidy condition.

14.5.2 Reopen the track.

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15. Lubricate A Point Blade

15.1 INTRODUCTION:

Switch points must be lubricated regularly in order to ensure that their operation is smooth and positive and to minimise the risk of injury to the members who switch them.

15.2 SECURE THE SITE.

Ensure the tracks around the turnout are clear of rail traffic.

Note: Both the greaser and the watcher are to check that any tracks adjacent to the turnout are also clear of traffic.

15.3 CLEAN THE POINTS.

15.3.1 Clean all the chair plates.

Note: Use the scraper and brush to remove build up of old lubricant and dirt. The bases of the chairs and between the switch blades and stock rails must be clean.

15.4 LUBRICATE THE POINTS.

15.4.1 Using the oil or grease supplied for the purpose (i.e. the biodegradable environmentally friendly lubricant), apply the lubricant to the inside and outside of the chairs.

15.4.2 Apply a small amount of lubricant to the stock rail (outside rail) where it is contacted by the point blade.

15.4.3 Also apply small amounts of lubricant to the **INSIDE** surface of the running rails where the flanges would rub against the running rails.

15.4.4 Be careful not to put any lubricant onto the rail head running surface.

15.4.5 Operate the points a number of times to ensure the switching is smooth and positive.

15.4.6 Note any defective or missing components on the *STM Occurrence Report* (STM6033).

15.5 COMPLETE THE JOB.

15.5.1 Ensure the points are left set as found.

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16. Isolate Rail Track Using a Point Clip

16.1 DEFINITIONS

Point Clip Assembly - Consists of:

- i. Point clip bracket; and
- ii. Padlock and key.

16.2 INTRODUCTION:

This procedure only details how to implement the accepted method of track isolation. It is the duty of the responsible person to ensure that the section of track to be worked on is totally isolated from rail traffic.

Note: Never set points into buildings.

16.3 LOCK POINTS USING A POINT CLIP.

- 16.3.1 Ensure that the “lock point” assembly is complete.
 - 16.3.2 Set the points away from the area to be isolated or worked on (manually).
 - 16.3.3 Make sure points are fully closed (no gap between the stock rail and the point blade).
 - 16.3.4 Install the point clip to the closed switch blade and tighten securely.
 - 16.3.5 Fit appropriate lock to point clip.
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17. Mark Drill Points On Rails To Accept Fishplates

17.1 INTRODUCTION:

All rails have holes drilled at the required spacing during manufacture. Therefore, when complete lengths of rail are used no drilling is required. However, when part rails are used the cut end must be drilled in order to accept the fishplates which link the rails together.

17.2 MARK DRILL POINTS ON THE RAIL.

17.2.1 Line up the end of the tape measure with the end of the rail.

17.2.2 Use chalk to mark the centre lines on the head of the rail for the one, two or three holes which need to be drilled.

Note 1: When the rail is not cut squarely the tape must be aligned with the longer section of the rail.

Note 2: The distances of the centre lines of the holes from the end of the rail are shown on the table below:

17.2.3 CENTRE LINE HOLE MEASUREMENTS

Rail	1st Hole	2nd Hole	3rd Hole
<i>"T" Rail</i>			
30 kg/m (60lb/yd)			
35kg/m (71lb/yd)			
40kg/m (80lb/yd)			
45kg/m (90lb/yd)			
47kg/m (94lb/yd)			
53kg/m (107lb/yd)	60mm	190mm	315mm
60kg/m (120lb/yd)	90mm	220mm	350mm
<i>Grooved Rail</i>			
50kg/m (100lb/yd)			
51kg/m (102lb/yd)			

17.2.4 Remove the tape from the rail.

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18. Operate a Jim Crow

18.1 INTRODUCTION:

Rails which are to be pre-curved shall be formed with a mechanical rail bender. A screw type bender, called a “Jim Crow” is used and care shall be taken to form an even curve, free of kinks.

It is used to bend or crow rails to the required radii for curved tracks.

Our Jim Crow is ancient and uses a crow bar (hence the name) to provide leverage to turn a powerful screw to push against the rail which is restrained by the U shaped steel frame to bend the rail.

It takes three men to lift it comfortably and one or two to operate it. Rails heavier than 80lb per yard (40 kg per metre) seem to be beyond its capacity or the capacity of the operators.

18.2 OPERATING A JIM CROW.

18.2.1 Place the buda frame on to the head of the rail.

Note: Three men are required to lift the frame.

18.2.2 Place the “packing” cylinder between the buda frame and the head of the rail.

18.2.3 Advance the screw to the required setting to complete the operation.

18.2.4 Unwind the screw to the return position.

18.2.5 Repeat procedures throughout the length of the rail as required.

18.2.6 When finished remove “Jim Crow” from the head of the rail.

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19. Operate A Rail Drill

19.1 INTRODUCTION.

The rail drilling machine is a petrol driven portable machine used on the repair and maintenance of rail tracks.

Note 1: When operating machine care should be taken, gloves not to be worn and loose clothing secured.

Note 2: Two men are required to carry the drill and if it has to be carried any distance four men are required.

19.2 CARRY OUT PRE-OPERATION CHECK.

19.2.1 Check the fuel.

19.2.2 Check the oil level.

19.2.3 Place the choke to the "on" position.

19.2.4 Pull the starter rope and check if engine starts.

19.2.5 If the machine won't start, contact the workshop for assistance.

19.2.6 Put the choke to the "off" position.

19.2.7 Switch off the rail drilling machine.

19.3 SET UP DRILLING MACHINE READY TO OPERATE.

19.3.1 Mark appropriate hole pitch on head of the rail to be drilled.

19.3.2 Install the jaws and drill bit in the rail drilling machine.

19.3.3 Line up location mark on the rail drill to the marks for pitch holes, or other marks as required.

Note: Two men are required to operate the drill but to carry the machine any distance four men are required

19.3.4 Secure the rail drill to the head of rail with the clamp.

19.3.5 Adjust the rail drill so that the drill bit is at 90° to the rail.

19.3.6 Wind the drilling machine in until drill bit touches the rail.

19.4 OPERATE THE RAIL DRILLING MACHINE.

19.4.1 Make sure water hose is above the tip of the drill bit.

19.4.2 Turn on the water.

19.4.3 Start up the rail drilling machine – see section 18.2.8 & 18.2.9 above.

19.4.4 Engage the automatic feed.

19.4.5 Top up the water tank as required.

19.4.6 Switch off the automatic feed when the hole has been drilled.

19.4.7 Turn off the water.

19.4.8 Switch off the rail drilling machine.

19.4.9 Loosen off the rail clamp.

19.4.10 Remove the rail drilling machine from the rail.

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20. Safe Use of Oxy Acetylene Cutting Equipment

20.1 DEFINITION.

Flash Back Arrestors – A safety device which is installed onto the bottle gauges to prohibit the chance of a flash or flame from travelling back through the hoses and reaching the gas bottles.

Oxy-lance - The hand-held device which delivers the mix of oxygen and acetylene gases for the purpose of either cutting steel or heating selected materials.

20.2 INTRODUCTION:

Due to the nature of certain work, it may necessitate the use of oxy cutting equipment. This equipment could be used for a variety of jobs, including cutting of bolts, cutting plates, loosening tight bolts or nuts, cutting rails, or general heating requirements. Due to the hazards associated with this equipment, it should only be operated by competent persons who have been trained in the safe use of oxy cutting equipment.

20.3 SAFETY INSTRUCTIONS.

- 20.3.1 Never allow naked flames, sparks or any other ignition sources in the vicinity of the oxygen or acetylene bottles/cylinders.
- 20.3.2 Flash back arrestors must be installed at all times prior to using.
- 20.3.3 Cylinders and hoses must be securely held during transport in the truck.
- 20.3.4 Hoses must be thoroughly checked prior to commencing a job and tagged as “out of service” or reported to the site supervisor if any faults are detected.
- 20.3.5 The safe use of oxy acetylene cutting equipment requires the use of extra “mandatory” PPE to be work, e.g. cutting goggles and leather gloves.
- 20.3.6 The work area must be free of potential flammable material before commencing work.
- 20.3.7 Any piece of material that has been in contact with the oxy lance must be treated as very hot and never touched or picked up until such time as it has been cooled or rendered safe to do so.
- 20.3.8 Gas cylinders are potentially lethal as high powered projectiles if they were to be dropped on the neck of the cylinder. Therefore, extreme caution must be taken when manual handling or any loading of these cylinders is being done.
- 20.3.9 Personal Protective Equipment (PPE) to be used during this procedure is the following:
 - i. Safety hat (in safety hat areas)
 - ii. Safety oxy cutting goggles
 - iii. Safety vest (if required to be used on track work)
 - iv. Hearing protection
 - v. Leather boilermaker’s gloves.

20.4 PRE-WORK INSPECTION AND ASSEMBLY OF GEAR.

20.4.1 Before leaving for the work site, ensure that bottles are securely held in the back of truck or on the “work” tram. Secure tightly if necessary. Check that hoses are secure inside vehicle.

20.4.2 Check:

- That bottle spanner is available and flash back arrestors are available;
- Gauges of bottle to ensure adequate gases are available to complete job;

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- Oxy lance is in vehicle; and
 - Goggles and leather gloves are available.
- 20.4.3 Once at the job site, use bottle spanner to crack bottles and clean out valves (blow-out). Ensure that there are no naked flames or ignition sources in immediate vicinity.
- 20.4.4 Attach bottle gauges to correct bottles (black gauge – oxy, red gauge – acetylene).
- 20.4.5 Attach flashback arrestors to bottle gauges (oxygen flash back to oxy bottle, acetylene flash back to acetylene bottles).
- 20.4.6 Attach correct hoses to flash back arrestors (oxy hose – black, acetylene hose – red). Ensure fittings are tight (no leaks).
- 20.4.7 Attach oxy lance to end of hose and tighten fittings (no leaks).
- 20.5 SET-UP JOB FOR OXY ACETYLENE CUTTING.
- 20.5.1 Run out hoses from truck to job if possible. If truck cannot get close to job, then bottles may need to be moved from truck to job site. This may require help to safely move bottles.
Note: Stored gas cylinders can release extreme energy if accidentally dropped – so care must be taken when manually handling the cylinders/bottles.

Ensure hoses cannot be damaged if they are lying on ground or across rail tracks.
- 20.5.2 Clean work area around site to be worked on, so as flammable material is removed.
Note: Oxygen and grease, when combined, can readily combust or explode, so never use the oxy lance to blow or burn away any build up of grease.
- 20.5.3 Once area is clean, fit appropriate PPE (goggles and gloves). Ensure area to be worked on is isolated from rail traffic and that a standby person is in place to monitor the safety of person using oxy cutting equipment.
- 20.5.4 Turn on acetylene knob on lance and ignite gas with spark gun.
- 20.5.5 Turn on oxygen knob slowly to introduce oxygen gas to strengthen flame.
Note: Adjust gas settings to get required flame for the type of work, e.g. cutting or heating.
- 20.5.6 Slowly approach area to be cut or heated with oxy lance and introduce oxygen booster as required to complete job. Ensure hoses are well clear of hot material. When job is complete, turn off acetylene knob first on the lance then turn off oxygen knob on the lance.
- 20.5.7 Withdraw lance and hoses from area. Turn off valves on both cylinders (oxygen and acetylene). Bleed off gases from both hoses by using knobs on lance. Hoses can now be uncoupled and gear can be packed away.
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