



VULCAN MINE

Mine Operating Procedure Braking Systems



Contents

1.	PURPOSE	3
2.	SCOPE	3
3.	DEFINITIONS.....	3
4.	RISK MANAGEMENT.....	4
5.	CHANGE MANAGEMENT.....	5
6.	TRAINING AND COMPETENCE	5
7.	INCIDENT MANAGEMENT	5
8.	PROCEDURE	5
8.1.	Mandatory Requirements.....	5
8.2.	Site Entry Requirements	6
8.2.1.	Conducting Brake Testing.....	6
8.1.	Inspection and Testing.....	6
8.1.1.	Frequency of Brake Testing	6
8.1.2.	Pre-Testing Requirements.....	6
8.1.3.	Unladen Testing Requirements (Applies only to mobile equipment).....	6
8.1.4.	Mandatory Testing Requirements.....	7
8.1.5.	Fixed Plant	7
8.1.6.	Fixed Cranes, Jibs, Monorail Hoist.....	7
8.2.	Other Equipment not defined in appendices	7
9.	RECORDS.....	7
10.	ROLES AND RESPONSIBILITIES	8
11.	RELATED DOCUMENTS.....	8
12.	REFERENCES.....	8
13.	REVIEW.....	9
14.	DOCUMENT CONTROL.....	9
15.	Appendix A - Test Frequency Surface Operations.....	10
16.	Appendix B – LV and MV Performance Requirements	10



1. PURPOSE

The purpose of this Mine Operating Procedure (MOP) is to clearly define and outline the braking systems requirements for the Vulcan Mine Site and to ensure plant and equipment inspection processes are followed, including the provision and review of relevant documentation.

2. SCOPE

This MOP is applicable to all CMWs (Coal Mine Workers) at the Vulcan Mine Site and includes employees, contractors, employees of a contractor, a service provider, or an employee of a service provider to ensure the standards are achieved for equipment compliance to the SHMS (Safety and Health Management System)

The controls within this procedure are mandatory.

3. DEFINITIONS

TERM	DEFINITION
Aggregated Trailer Mass (ATM)	The total mass of the laden trailer when carrying the maximum load recommended by the manufacturer. This includes any mass imposed onto the drawing vehicle when the combination vehicle is resting on a horizontal supporting plane.
Authorised Person	Any person that has been trained, assessed, and authorised to conduct equipment compliance inspections on behalf of Vulcan Mine; employee or contractor.
Brake Test Area	Area is to be flat, reasonably smooth, horizontal, well compacted with slight amount of moisture not to adversely affect performance and sufficient length and width.
Combination Test	Where the trailer and the prime mover are tested together as a 'combination'.
Competent Person	A person who has, through a combination of training, education, and experience, acquired knowledge and skills enabling that person to correctly perform a specified task.
Compliance Criteria	Standards established via statutory, corporate and site requirements to control identified plant and equipment risks.
CMSHA	Queensland Coal Mining Safety and Health Act (1999).
CMSHR	Queensland Coal Mining Safety and Health Regulation (2017).
Dynamic Test	Involves the functional testing of a brake system in a dynamic situation with a measured record of the results.
Emergency Brake	System used to stop a machine in the event of any single component failure. (Secondary Brake).
Fixed Plant	Plant not readily transportable.
Functional Test	Test that determines the braking system is working as designed/intended.
Intrusive Brake Repairs	Work requiring repair, replacement or bleeding of any component in the application circuit of a brake system.
Laden (or fully laden)	The operating mass of the machine including the rated payload. The operating mass of a machine includes the heaviest combination of cab, canopy and protective structures, e.g., roll-overprotective structures (ROPS) and falling object protective structures (FOPS). It also includes components, mountings and equipment, which are approved by the manufacturer of the machine, a 75 kg operator, a full fuel tank, and full lubricating, hydraulic and cooling systems.
Maintenance Management System	A system for managing the maintenance of plant and equipment, which encompasses the compliance database, scheduling, and documentation.



Mandatory Brake Test Record Sheets	This is the sheet handed out with the work request. It has the relevant information that needs to be collected and the vehicles that the brake tests have to be performed on. This sheet is attached to this document for reference. This sheet is handed back to the maintenance supervisor at the completion of the test.
Mobile Plant	Plant capable of being moved under its own power. e.g., Shovels, Excavators, Trucks.
MOP	Mine Operating Procedure
OEM	Original Equipment Manufacturer.
Owner	Person or organisation that owns the plant or equipment.
Park Brake	Park Brake is a system used to hold a stopped machine stationary for prolonged periods.
Retarder	Energy absorbing device that is able to control the speed of the machine.
RSHQ	Resources Safety and Health Queensland
Service Brake	System used to stop and momentarily hold the machine.
SSE	Site Senior Executive.
SHMS	Safety and Health Management System.
SOP	Standard Operating Procedure.
Supplier	Person or organisation providing plant or equipment.
SWP	Safe Work Procedure
Transportable Equipment	Equipment transported or towed by other equipment and required to be moved to a new position between periods of operation. e.g., lighting plant, crib huts, generators and pumps.
Unladen	The operating mass of the machine NOT including the rated payload.

4. RISK MANAGEMENT

A risk assessment shall be conducted for the introduction to site of new equipment both fixed and mobile in accordance with VUL-MOP-049-Risk and Hazard Management. This includes but not limited to the following below. The risk assessment shall take into consideration:

- VUL-SOP-021-Electrical work;
- VUL-MOP-066-Braking systems;
- VUL-SOP-067-Guarding;
- VUL-SOP-072a-Tyres, Wheels, and Rims Management;
- VUL-SOP-076-Using Mobile Plant;
- VUL-SOP-072c-Assembling and Maintaining Plant;
- VUL-SOP-072e-Lifting Operations;
- VUL-SOP-072g-Towing Mobile Plant;
- VUL-SOP-072h-Servicing, Lubricating and Refuelling;
- VUL-SOP-072i-Transporting Heavy Plant and Supplies;
- VUL-SOP-078-Isolation and Tagging;
- VUL-SOP-079-Electrical and Mechanical Equipment used to Maintain Plant;
- VUL-SOP-080-Fluid Above and Below Atmospheric Pressure;
- VUL-SOP-096b-Manual Handling Tasks and Ergonomics;
- VUL-SOP-098-Reporting and Rectifying Defects;
- That the equipment is fit for purpose and meets site requirements; and
- Chain of responsibility form on Auditing tool.

NOTE - Workers have a duty to take reasonable care for their own health and safety and to not adversely affect the health and safety of other persons. Workers must comply with reasonable instructions, as far as they are able, and cooperate with reasonable health and safety policies or



procedures that has been notified to workers, including information, instructions, and training in relation to work carried out by the worker conducting equipment compliance and inspections. If personal protective equipment (PPE) is provided, the worker must as far as they are able, use or wear it in accordance with the information, instructions and training provided.

5. CHANGE MANAGEMENT

Change Management processes in accordance with shall be followed for any modifications to plant, equipment and or vehicles, including the attachment of equipment in accordance with;

- VUL-MOP-064(3)-Change Management Plan;
- VUL-SOP-068-Modifying Fixed & Mobile Plant; and
- VUL-FRM-02-02-Change Management Request.

6. TRAINING AND COMPETENCE

Authorised Personnel who are conducting plant and equipment compliance inspections shall hold the relevant competencies, appointment and or authorisations:

Equipment	Equipment Compliance Competencies	Brake Testing Competencies
Light Vehicle	RIISAM301	AURLTB002
Medium Vehicle	RIISAM301	AURHTB005
Medium Equipment	RIISAM301	AURKTB002
Surface Mobile Equipment	RIISAM301	AURKTB002
Ancillary Equipment	RIISAM301	
Electrical Equipment	RIISAM301 & Appointed Electrical Worker	

7. INCIDENT MANAGEMENT

If plant and equipment are involved in an incident or accident, the plant or equipment may require re-compliance inspections to return to work. This will be determined on a case-by-case basis and will be at the discretion of the SSE and or Asset Manager.

Should re-compliance be required, the plant or equipment must not return to work until braking compliance is completed, reviewed, and approved by the Vulcan Mine Asset Manager.

8. PROCEDURE

This MOP enables plant and equipment braking systems to be assessed against the site requirements, and if successful, to be issued with an Brake Test Compliance approval sticker authorising the equipment to be used or operated on the Vulcan Mine Site. Once on site, all plant and equipment will be routinely inspected and audited to site standards outlined within this document and the Vulcan Mine SHMS to ensure plant and equipment are maintained.

8.1. Mandatory Requirements

The core mandatory requirements and expectations of Vulcan Mine are all plant and equipment are brake tested and compliant to operate on the Vulcan Mine Site and in accordance with the Vulcan Mine SHMS.

Should a system gap be identified, the Asset Manager shall be notified immediately and a risk assessment in accordance with **VUL-MOP-049-Risk Management**.

All types of braking systems are to be identified (service brakes, emergency brakes and park brakes).

Brake testing is to be conducted with consideration to the OEM's recommendations and in accordance with this Standard.



All equipment covered by this standard must have a documented maintenance program, relative to the equipment and based on the OEM recommendations. All maintenance, inspections and repairs must be recorded and available for audit when required.

All equipment must have a maintenance regime that encompasses brake inspection, servicing and testing to the manufacturers' recommendations or as determined necessary by risk assessment.

8.2. Site Entry Requirements

Prior to plant or equipment being approved for operation on the Vulcan Mine site, notification shall be provided to the Vulcan Mine Asset Manager and the Vulcan Mine Asset Manager must approve the plant or equipment:

- as being site compliant; and
- as being adequately maintained.

Plant and equipment braking compliance inspections are to be completed on the plant and equipment specific inspection forms and may require more than one inspection to be conducted depending on the type of plant and equipment.

Inspection forms are to be completed and recorded on Vulcan Mine's compliance audit tool and record keeping system.

Compliant plant or equipment must display a current Vulcan Mine compliance sticker.

8.2.1. Conducting Brake Testing

Persons undertaking brake tests must have the following respective competencies applicable to equipment being tested, additional to an engineering trades qualification:

- AURKTB002 Analyse and evaluate wheeled mobile plant braking system faults
- AURHTB005 Analyse and evaluate heavy vehicle braking system faults; and
- AURLTB002 Analyse and evaluate light vehicle braking system faults.

If a testing procedure is not available at the time of testing, a testing methodology needs to be developed and documented prior to testing by a competent and authorised person as per relevant AS 3450:2021. Refer to **Appendix B**.

Ensure equipment used for the purpose of conducting brake testing is in a fit for service condition and calibration requirements are current.

8.1. Inspection and Testing

8.1.1. Frequency of Brake Testing

Brake testing is to be conducted as per the frequency identified in **Appendix A**.

All braking systems effected must be tested following any intrusive brake maintenance.

8.1.2. Pre-Testing Requirements

All braking systems (service, emergency and park brakes) must be functionally tested before brake testing is carried out.

8.1.3. Unladen Testing Requirements (Applies only to mobile equipment)

Unladen testing must be conducted prior to mandatory testing, post intrusive brake repairs.

Unladen testing must not substitute mandatory laden testing.



8.1.4. Mandatory Testing Requirements

Equipment to be tested laden where applicable (the operating mass of the machine including the rated payload). Examples of equipment that cannot be tested laden are Forklift, Graders and Dozers.

Test speeds are stipulated in relevant work instructions, maximum speed of 32km/h for a service brake and 25km/h for emergency brake.

8.1.5. Fixed Plant

A documented brake management strategy for all braking devices must be in place and include as a minimum:

- Visual inspections for oil leaks and fluid levels of the actuator mechanisms and of any wear surfaces for thickness and condition of pads and discs, mechanism engages, holds and releases in the proper circumstances.

8.1.6. Fixed Cranes, Jibs, Monorail Hoist

Brakes must be tested in accordance with *AS 2550.1* and *AS 2550.3*.

8.2. Other Equipment not defined in appendices

Where braking systems are fitted, a risk assessment must be performed to identify any hazards and controls required that pertain to the equipment braking system.

The equipment must have a maintenance regime that encompasses brake inspection, servicing and testing to the manufacturers' recommendations or as determined necessary by risk assessment.

9. RECORDS

The Vulcan Mine's compliance audit tool and record keeping system shall capture the following information:

- The Compliance Equipment sticker ID.
- Name of the Company/Department the Compliance sticker is issued to.
- The Date of issue.
- The Date of re-inspection.
- The following Equipment details (as applicable):
 - Call sign/ID number.
 - Registration number and date of registration.
 - Make, type and model.
 - Brake testing records

A copy of the completed relevant Compliance Inspection Form is given to the Equipment Owner. Hard copy brake test sheet and results must stay with the plant or equipment.

A soft copy of the original shall be uploaded to and recorded in Vulcan Mine's compliance audit tool and record keeping system.

Records must be held for a minimum of seven years post decommissioning.



10. ROLES AND RESPONSIBILITIES

SSE	Shall review and approve this procedure.
HST Manager	Shall ensure that all provisions of this procedure are implemented, and that compliance is achieved.
Superintendents	Shall be responsible for their area of operations and the implementation and application of this procedure; Provide adequate training, information, structure and supervision to ensure that this procedure is implemented; Carry-out a periodic review of activities to ensure the appropriate application and understanding of this procedure; and Ensure immediate and appropriate steps are taken to investigate and rectify any risks to health and safety arising from these activities.
Supervisors	Ensure all CMWs are familiar with, have access to and comply with the requirements set out in this procedure.
All CMWs (including visitors and contactor)	Shall comply with the requirements of this procedure.

11. RELATED DOCUMENTS

- VUL-MOP-064(3)-Change Management Plan
- VUL-SOP-068-Modifying Fixed & Mobile Plant
- VUL-MOP-071- Equipment Compliance

12. REFERENCES

- AS 1418.19-2007 Cranes, hoists and winches - Telescopic handlers
- AS 2550.1-2011 Cranes, hoists and winches - Safe use - General requirements
- AS 2550.3-2002 Cranes, hoists and winches - Safe use Bridge, gantry, portal (including container cranes), jib and monorail cranes
- AS/NZS 4024.3610:2015 Safety of machinery Conveyors - General Requirements
- Coal Mining Safety and Health Act 1999 (Qld)
- Coal Mining Safety and Health Regulation 2017 (Qld)
- ISO 3450:2011 Earth-moving machinery - Wheeled or high-speed rubber-tracked machines - Performance requirements and test procedures for brake systems
- ISO 6292:2020 Powered industrial trucks and tractors – Brake performance and component strength
- NHVR Heavy Vehicle (Vehicle Standards) National Regulation
- Transport Operations (Road use Management – Vehicle Standards and Safety) Regulation 2010
- Vehicle Standard (Australian Design Rule 38/05 – Trailer Brake Systems) 2018



13. REVIEW

This document shall be reviewed at a minimum every three years or when triggered by any of the following events:

- A site or external accident or incident directly related to the document contents;
- A legislated change directly related to the document contents;
- If directed an RSHQ Mines Inspector or Industry Safety and Health Representatives;
- As a result of an inspection, audit, hazard identification, safety observations, risk assessment or other processes where the actions recommended are directly related to the document contents; or
- A change required by the Vulcan Mine SSE; or

14. DOCUMENT CONTROL

Version	Date	Description	Document Controller
01	28/03/2022	Initial Draft	Shane Walters
02	29/03/2022	Review with subject matter experts	Michael Cavanagh
03	31/03/2022	Review and formatting	Michael Cavanagh
04	13/08/2024	Review and formatting	Kelly Jensen





15. Appendix A - Test Frequency Surface Operations

	Description	3 Monthly	6 Monthly	12 Monthly	After intrusive brake repair AND at OEM recommended major brake overhaul (whichever comes first)
Light Vehicles	Mandatory Test (Dynamic Test as presented fit for service full system)			✓	✓
Medium Vehicles	Mandatory Test (Dynamic Test as presented fit for service full system)		✓		✓
SME – Wheeled Machines	Unladen Testing		To be conducted prior to undertaking a loaded test post intrusive repair/s		
	Mandatory Test (Laden where applicable)		✓		✓
Forklift and Industrial Tractors	Mandatory Test			✓	✓
Trailers all classes (TB, RC, TD)	Mandatory Test			✓	✓
Tracked Surface	Functional Test		As per manufacturer / OEM recommendation		
Earthmoving Equipment	Dynamic Test		As per manufacturer / OEM recommendation		
Fixed Plant	Brake Test		As per manufacturer / OEM recommendation		

16. Appendix B – LV and MV Performance Requirements

ROAD REGISTERED VEHICLES	SERVICE BRAKE PERFORMANCE %	EMERGENCY BRAKE PERFORMANCE %	PARKING BRAKE (Test Grade)
	BP %	BP%	Gradient %
Light Vehicles	28%	15.5 %	Max 15% gradient
Medium Vehicles	28%	15.5%	Max 15% gradient