



**Australian Government**

# **PMBPROD368 Repair conveyor belt carcass**

**Release: 1**

# PMBPROD368 Repair conveyor belt carcass

## Modification History

Release 1. Supersedes and is equivalent to PMBPROD368B Repair conveyor belt carcass

## Application

This unit of competency covers the skills and knowledge required to repair conveyor belt carcasses. It applies to all types of industrial conveyor belts (e.g. steel cord, fabric reinforced ply belts and solid woven belts).

This unit of competency applies to experienced operators who are required to plan and sequence the repair job, prepare the belt carcass, make and inspect the repair, remedy faults and non-conformity and solve problems within area of responsibility.

This unit of competency applies to an experienced operator demonstrating theoretical and technical knowledge and well developed skills in situations that require some discretion and judgement. The operator may work alone or as a member of a team or group and will work in liaison with other shift team members, team leader and supervisor, as appropriate.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## Pre-requisite Unit

PMBPROD265 Operate portable vulcanising equipment

## Competency Field

Production

## Unit Sector

Not applicable

## Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

|   |                                  |     |                                                         |
|---|----------------------------------|-----|---------------------------------------------------------|
| 1 | <b>Plan belt carcass repairs</b> | 1.1 | Review belt specifications and work order documentation |
|   |                                  | 1.2 | Identify hazards and risk controls                      |

- 1.3 Identify belt faults, consider reparability and decide on appropriate repair method
  - 1.4 Plan work, including sequences, times and process stages
  - 1.5 Plan to minimise downtime, economically use materials and meet repair quality specifications
  - 1.6 Assemble equipment, tools and materials required, checking them for condition, quality and compliance tags
- 2 **Conduct belt carcass repairs**
  - 2.1 Select a well-ventilated work area for the repair and remove any contaminants
  - 2.2 Isolate equipment and tag according to procedures (if applicable)
  - 2.3 Strip and remove damaged material
  - 2.4 Cut belt carcass to the appropriate shape and angles and buff edges
  - 2.5 Prepare damaged area and cut repair materials to size as required
  - 2.6 Prepare and finish surfaces to be bonded according to procedures
  - 2.7 Apply bonding materials and conduct repair according to procedures
  - 2.8 Vulcanise belt repair (where required)
- 3 **Check belt repair**
  - 3.1 Check repairs meet quality specifications
  - 3.2 Further repair areas which do not meet quality specifications or tag for further treatment
  - 3.3 Inform customer when belt is ready for use, or prepare belt for storage or delivery
- 4 **Clean work area**
  - 4.1 Clean, inspect and store tools and equipment used

- |   |                                      |                                                                                           |
|---|--------------------------------------|-------------------------------------------------------------------------------------------|
|   | 4.2                                  | Tag unserviceable tools and equipment, identify faults and inform relevant personnel      |
|   | 4.3                                  | Clean work area and return to approved condition                                          |
|   | 4.4                                  | Dispose of waste or recycle according to procedures                                       |
|   | 4.5                                  | Complete appropriate workplace documentation                                              |
| 5 | <b>Anticipate and solve problems</b> |                                                                                           |
|   | 5.1                                  | Recognise a problem or a potential problem                                                |
|   | 5.2                                  | Determine problems needing priority action                                                |
|   | 5.3                                  | Refer problems outside area of responsibility to appropriate person, with possible causes |
|   | 5.4                                  | Seek information and assistance as required to solve problems                             |
|   | 5.5                                  | Solve problems within area of responsibility                                              |
|   | 5.6                                  | Follow through items initiated until final resolution has occurred                        |

## Foundation Skills

This section describes those required skills (language, literacy and numeracy) that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

**Regulatory framework** The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used.

Applicable legislation, regulations, standards and codes of practice include:

- health, safety and environmental (HSE) legislation, regulations and codes

of practice relevant to the workplace, manual handling and hazardous materials

- Australian/international standards relevant to the materials being used and products being made
- any relevant licence and certification requirements.

All operations to which this unit applies are subject to stringent HSE requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and such requirements the legislative requirements take precedence.

**Procedures** All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or any combination of:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant.

**Tools and equipment**

Tools and equipment include:

- knives and cutting tools
- hand tools (e.g. pliers and brushes)
- vulcanising equipment/portable vulcanising equipment
- belt restraining devices.

Additional tools and equipment will be selected as required from:

- portable power generating equipment
- hoists/lifting equipment not requiring any special permits or licences
- manual handling aids, such as hand carts and trolleys
- relevant personal protective equipment (PPE).

**Hazards** Hazards must be identified and controlled. Identifying hazards requires

consideration of:

- damaged rubber and cords
- knives, cutting blades and grinding equipment
- weight, shape, volume of materials to be handled
- hazardous products and materials
- lifting, tracking and securing hazards
- rotational equipment or vibration
- sharp edges, protrusions or obstructions
- slippery surfaces, spills or leaks
- smoke, dust, vapours or other atmospheric hazards
- high temperatures
- electricity
- gas
- gases and liquids under pressure
- structural hazards
- equipment failures
- machinery, equipment and product mass
- other hazards that might arise.

## **Problems**

Non-routine problems must be resolved by applying operational knowledge to develop new solutions, either individually or in collaboration with relevant experts, to:

- determine problems needing action
- determine possible fault causes
- develop solutions to problems which do not have a known solution
- follow through items initiated until final resolution has occurred
- report problems outside area of responsibility to designated person.

Non-routine problems are unexpected problems or variations of previous problems and include one or more of:

- access/location issues
- variations in quality
- vulcanising problems
- belts that are not suitable for repair
- emergency situations
- intermittent faults.

Operational knowledge includes one or more of:

- procedures

- training
- technical information, such as journals and engineering specifications
- remembered experience
- relevant knowledge obtained from appropriate people.

## Unit Mapping Information

Release 1. Supersedes and is equivalent to PMBPROD368B Repair conveyor belt carcass

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=932aacef-7947-4c80-acc6-593719fe4090>

# Assessment Requirements for PMBPROD368 Repair conveyor belt carcass

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## Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria and demonstrate the ability to:

- read and interpret procedures, job specifications, instruments/control panels, material labels and safety data sheets (SDS)
- select repair method and plan and sequence the work
- prepare belt carcass and reinforcements for repairs
- monitor key variables, including:
  - belt cover condition
  - belt location
  - degree of damage
  - forces acting on the conveyor belt
  - environmental conditions
  - lock-out of equipment
- check carcass repair
- make further repairs to remedy faults and non-conformity or tag for further treatment
- identify hazards and apply relevant hazard controls
- apply safety procedures
- apply housekeeping procedures
- apply waste management procedures
- recognise early warning signs of equipment/processes needing attention or with potential problems
- distinguish between causes of problems, including:
  - abrasion
  - impact
  - tearing
  - operational problems
  - materials properties/failure
  - process variables
  - mechanical problems
  - procedural errors
- recognise and prioritise problems requiring action
- resolve non-routine problems

- communicate effectively with team/work group and supervisors
- complete workplace records
- determine the angle and dimensions of the repair
- do basic arithmetical manipulations, including additions, subtractions, divisions, fractions and percentages.

## Knowledge Evidence

Must provide evidence that demonstrates knowledge relevant to their job sufficient to operate independently and to solve routine and non-routine problems, including knowledge of:

- function of conveyor systems and relevant isolation procedures
- stresses and tensions on working belts and common causes of failure
- types of belt reinforcement and related repair methods
- requirements for cable lay up and ply replacement in forming a satisfactory repair
- products, materials and material characteristics for carcass repairs
- impact of incorrect or faulty repair processes or materials
- effects of temperature, pressure and time on the curing process
- changes in conveyor and repair materials during the repair process
- impact of variations in raw materials and equipment operation in relation to final product
- factors which may affect product quality or production output and appropriate remedies
- non-routine problems that may arise, the range of possible causes and appropriate actions
- organisation procedures relevant to the work environment/job role
- hierarchy of control
- hazards that may arise in the job/work environment and:
  - their possible causes
  - potential consequences
  - appropriate risk controls.

## Assessment Conditions

- The unit should be assessed holistically and the judgement of competence shall be based on a holistic assessment of the evidence.
- In all plants it may be appropriate to assess this unit concurrently with units such as:
  - *MSAPMOPS363 Organise on site work*
  - *PMBPROD369 Repair conveyor belt covers*
- Where the assessee does not currently possess evidence of competency in *PMBPROD265 Operate portable vulcanising equipment* it may be co-assessed with this unit.
- The collection of performance evidence is best done from a report and/or folio of evidence drawn from:
  - a single project which provides sufficient evidence of the requirements of all the elements and performance criteria
  - multiple smaller projects which together provide sufficient evidence of the requirements of all the elements and performance criteria.

- A third-party report, or similar, may be needed to testify to the work done by the individual, particularly when the project has been done as part of a project team.
- Assessment should use a real project in an operational workplace. Where this is not possible or where personal safety or environmental damage are limiting factors assessment must occur using a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Assessment in a simulated environment should use evidence collected from demonstration of skills and one or more of:
  - walk-throughs
  - pilot plant operation
  - industry-based case studies/scenarios
  - 'what ifs'.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications associated with this unit.
- The regulatory framework will be reflected in workplace policies and procedures and is not required to be independently assessed.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- In addition the assessor or anyone acting in subject matter expert role in assessment shall demonstrate both technical competency and currency. If the assessor cannot demonstrate technical competency and currency they shall assess with a subject matter expert who does meet these requirements.
- Technical competence can be demonstrated through one or more of:
  - relevant VET or other qualification/Statement of Attainment
  - appropriate workplace experience undertaking the type of work being assessed under routine and non-routine conditions
  - appropriate workplace experience supervising/evaluating the type of work being assessed under routine and non-routine conditions
- Currency can be demonstrated through one or more of:
  - being currently employed undertaking the type of work being assessed
  - being employed by the organisation undertaking the type of work being assessed and having maintained currency in accordance with that organisation's policies and procedures

- having consulted/had contact with an organisation undertaking the type of work being assessed within the last twelve months, the consultation/contact being related to assessment
- conducting on the job training/assessments of the type of work being assessed
- being an active member of a relevant professional body and participating in activities relevant to the assessment of this type of work.

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