MANIFOLDS
TURBOS
JUNCTIONS
ENGINE PIPES
MUFFLERS
TAILPIPES
FIREWALLS

BLANKETS

INSTALLATION & USER GUIDE / V2

- THERMAL BLANKET INSTALLATION
- SERVICING & MAINTENANCE
- WORKSHOP GUIDE: GOOD INSTALL
- WORKSHOP GUIDE: CONDITION TIPS
- PRODUCT WARRANTY

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Contents

1.0 INTRODUCTION 3

2.0 BLANKET INSTALLATION 4

2.1 Pre-Installation 5
Tools Required 5
Planning 6
Take 5 Checklist 7

2.2 Techniques 8
Blanket Guidelines 8
Installation Order 9
Tie-Wire Preparation 10

2.3 Installation 12
Manifold Blankets 11
Turbo Blankets 14
Junction Blankets 16
Engine Pipe Blankets 20
Muffler Blankets 22
Tailpipe Blankets 23
Firewall Blankets 24
Fire Sleeve for Turbo Feeds 25

2.4 Finalising Installation Checklist 26

3.0 MAINTENANCE GUIDELINES 27

3.1 Proactive Maintenance – Service Checklist 28

4.0 WORKSHOP GUIDE: GOOD FITMENT & CONDITION TIPS 29

4.1 Good Fitment 30

4.2 Blanket Condition 32

5.0 PRODUCT WARRANTY 34

5.1 Warranty Form 35

1.0 Introduction

FIRE MITIGATION STRATEGY

Thank you for choosing Aletek thermal insulation blankets! Aletek blankets are designed and made in Australia with high-grade materials. The lobster-back blanket sections and quick-fit springs provide a snug fit. Shielding exhaust surfaces and reducing surface temperatures will bring you one step closer to fire mitigation success.

Aletek's blanket cheat sheets can put your maintenance crew on the path to successful fire mitigation. Download these sheets and add them to your job packs and training resources from **www.aletek.com.au/thermal-blankets/mining-lagging-installs-services**

PURPOSE OF THIS HANDBOOK

All personnel using, maintaining, and managing thermal insulation blankets should read this User Handbook. Thermal blankets should be fitted by experienced personnel. For effective fire mitigation, the fitting order must be followed and the installation must be done correctly. This guide provides general principles for popular machines and models. The underlying principles are typically universal and should be read and translated to suit your specific equipment and application.

USE THIS QR CODE TO ACCESS BLANKET INSTALL VIDEOS. QR CODES IN THE INSTALL SECTION LEAD TO PROCESS-SPECIFIC INSTRUCTIONS.

2

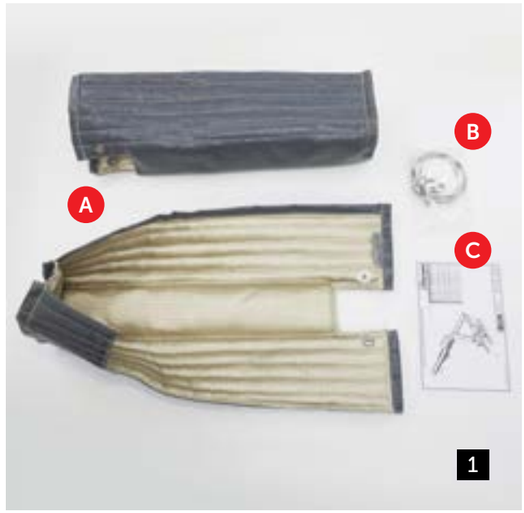
BLANKET INSTALLATION

2.1 Pre-Installation

TOOLS REQUIRED

BOX CONTENTS

Step	Task/Activity
1.	Blankets (A), tie-wire and spare springs (B), install drawing (C).



TOOLS REQUIRED

Step	Task/Activity
1.	Long nose pliers (A), side cutters (B), notched long flat blade screwdriver (C), tools for engine bay access (D). Safety glasses (E), gloves (F) and PPE.

2.1 Pre-Installation

PLANNING

PARTS DRAWINGS

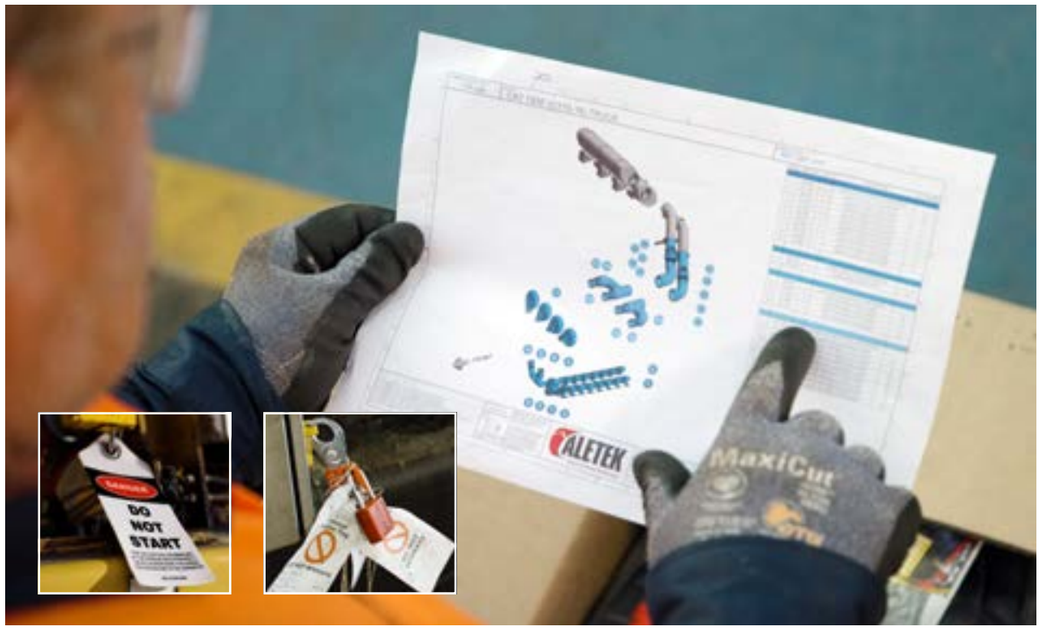
Aletek parts drawings are supplied with thermal blanket kits. The table on the drawing contains install order (see below). This information is essential for a successful thermal blankets installation.

ITEM	PART NO	QTY	DESCRIPTION	FIT ORDER
	143-300	1	MANIFOLD INSULATION COVER GROUP	
1	101-133	1	MANIFOLD INSULATION COVER	9
2	166-073	1	MANIFOLD INSULATION COVER	10
3	164-560	1	MANIFOLD INSULATION COVER	7
4	117-425	1	MANIFOLD INSULATION COVER	8
5	182-366	1	MANIFOLD INSULATION COVER	1
6	146-527	1	MANIFOLD INSULATION COVER	2
7	126-393	1	MANIFOLD INSULATION COVER	3
8	191-334	1	MANIFOLD INSULATION COVER	4
9	113-043	1	MANIFOLD INSULATION COVER	5
10	177-983	1	MANIFOLD INSULATION COVER	6

Above: Parts drawing detail with install order

PRE-INSTALL PLANNING

1. Ensure machine is isolated and locked out before work begins
2. Ensure correct PPE is worn (gloves, safety glasses)
3. Complete a 'Take 5' safety check prior to starting
4. Inspect engine pipes for holes or leaks before fitting blankets
5. Open box and lay all parts out
6. Examine the enclosed drawing showing blanket install
7. Identify parts and place in working order (including springs)
8. Follow parts drawing install order on the drawing supplied



2.1 Pre-Installation

TAKE 5 CHECKLIST

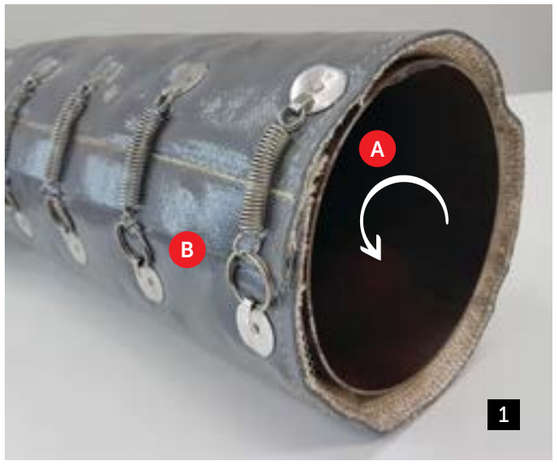
Customer:		Job No.
Machine Unit No.	**Machine Serial No.**	**Blankets Group Part No.**
Questions	**Answers**	**Initials (by Fitter)**
Asset parked, fundamentally stable?		
Machine Isolated from starting?		
Work order matches task?		
Competent to complete works?		
Have access equipment?		
Tools required for works?		
Do I need lifting assistance?		
Am I working at heights?		
Correct drawing for task?		
All parts checked off?		
Ensure paint is burnt off manifolds, turbos and junctions before fitting blankets (fire hazard)		
Check for exhaust leaks and flammable fluids before fitting blankets (fix before fitting blankets)		
New parts fitted as per drawing?		
Documentation filled out?		
Remove isolation?		
Run machine to temperature (and allow time to cool)		
Final checks		
Comments		

2.2 Techniques

BLANKET GUIDELINES

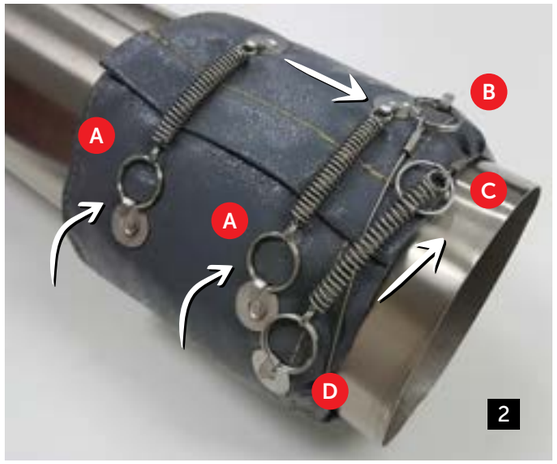
BLANKET INSTALLATION

Step	Task/Activity
1.	Pull the blanket flap vertically downwards **(A)**. Where possible, orientate the flap to face vertically downwards **(B)** to eliminate potential fluid ingress.



SPRING ATTACHMENT

Step	Task/Activity
2.	Spring the blanket together prior to fastening the wire ends **(A)**. Attach the un-sprung end of the wire cable **(B)**. Pull the cable tight using the attached keyring **(C)**. Attach the sprung end of the wire cable **(D)**.



INSTALL DETAILS

Closeup of quick-fit springs with keyrings secured in place.

2.2 Techniques

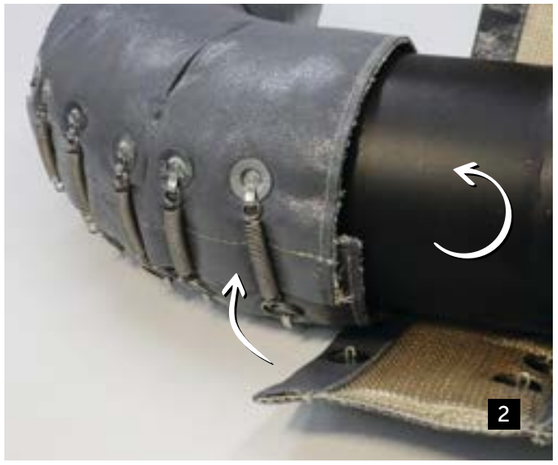
INSTALLATION ORDER

OVERLAPPING SECTIONS

Step	Task/Activity
1.	Blanket pieces should be fitted to overlap those in a position prone to effects from gravity. This ensures liquids/fluid/debris runs off product removing seepage and potential ignition.

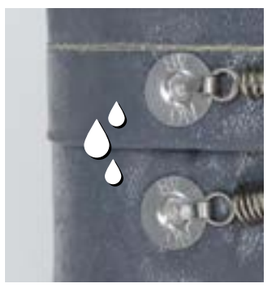
EASE OF INSTALLATION

Step	Task/Activity
2.	The lobster-back blanket design uses less blanket pieces. This eliminates install error (parts fit one way) and reduces overall install/removal times.



AVOID FLUID INGRESS

Closeup of overlapping pieces that account for fluid run-off due to gravity.



2.2 Techniques

TIE-WIRE PREPARATION

TIE-WIRE LOOPS

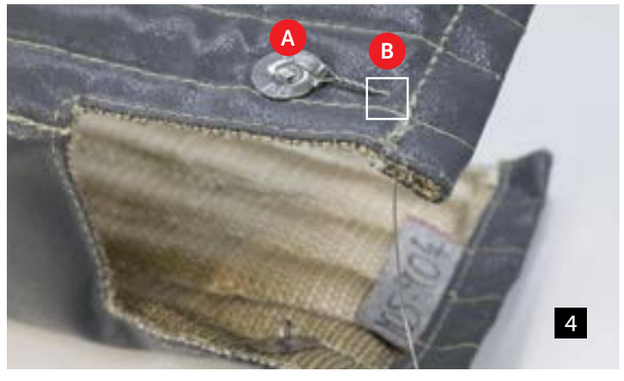
Step	Task/Activity
1.	Twist the wire to make a loop.

Step	Task/Activity
2.	Twirl the wire around itself.

Step	Task/Activity
3.	Trim excess wire and ensure no sharp edges protrude.

WIRE THREADING

Step	Task/Activity
4.	Poke the wire through the blanket and connect to the anchor (A). The wire should thread through the manifold blanket as pictured (B).



2.3 Installation

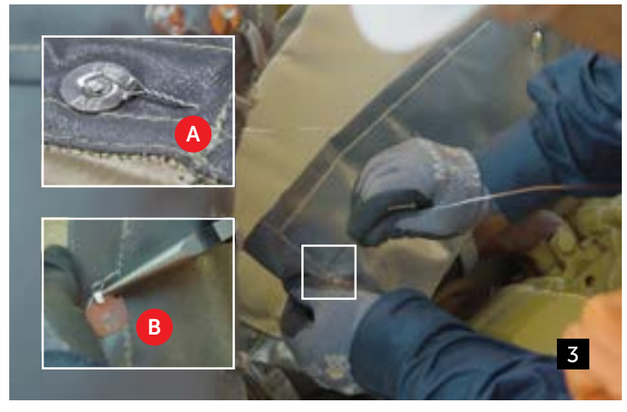
MANIFOLD BLANKETS

MANIFOLD INSTALLS

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Feed the manifold covers over the manifold. Watch out for clamps and bolts. Massage the blanket through with your hands.

Step	Task/Activity
2.	The outer grey layer should not touch the manifold once the blanket is in place. Cut the tie-wire to length, so it can wrap around the manifold and back on itself. Use long nose pliers to loop, twirl and cut excess wire (A) (see 2.2 Tie-Wire Techniques)

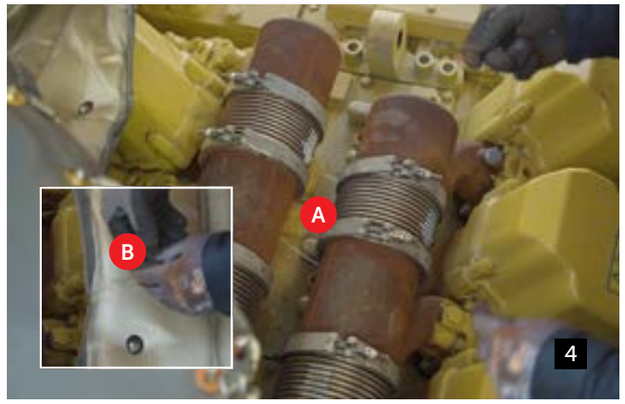
Step	Task/Activity
3.	Pierce the plain wire end through the outside of the blanket (A) beside the anchor point. Pull through until your loop is on the anchor. To secure the wire loop, crimp the anchor hook onto itself with pliers (B).



2.3 Installation

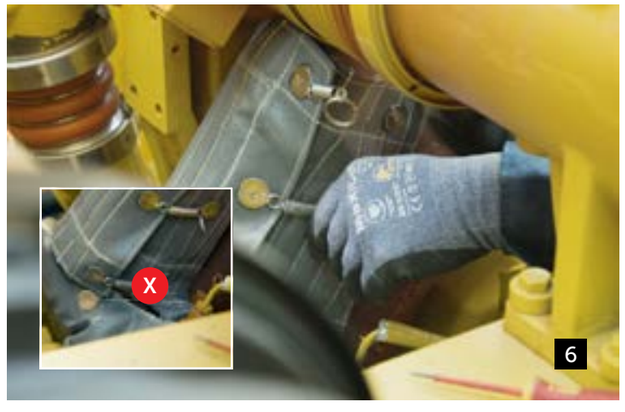
MANIFOLD BLANKETS

Step	Task/Activity
4.	Feed the wire around the manifold (A). Depending on the engine, this may be under or behind the 'log'. Put the blanket loosely in place. Pierce the wire from the inside of the blanket (B) beside the anchor point (opposite of Step 3).



Step	Task/Activity
5.	Before tensioning, position blankets correctly and avoid gaps and snagging. Tension wire until it's firm, then wind it around the hook a few times (A). Use side cutters to cut excess wire, no need to crimp anchor hook. **Important:** Manifold wire shouldn't be overtightened!

Step	Task/Activity
6.	Some engines need a cover between the manifold and turbo. It is important to follow the fitment order on the drawing. Avoid gaps (X) between the manifold and turbo to prevent hot spots (gaps between sections create potential ignition points).

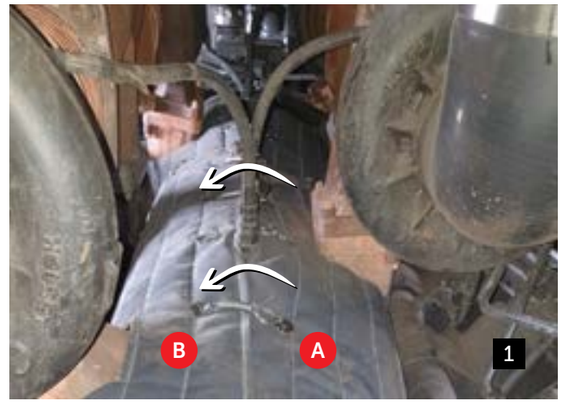


2.3 Installation

MANIFOLD BLANKETS (QSK60)

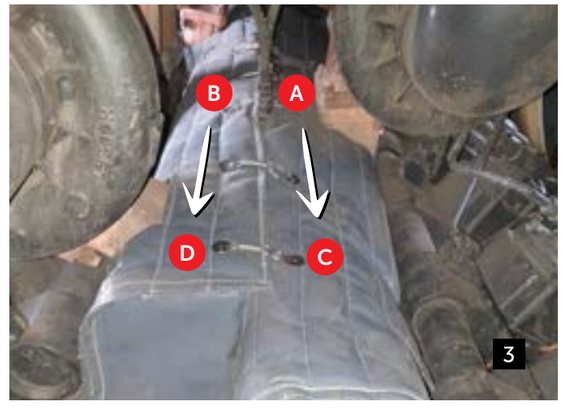
MANIFOLD INSTALLS (QSK60)

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Place (A) and (B) manifolds covers over the manifolds. Join (A) and (B) together with springs.



Step	Task/Activity
2.	Place (C) and (D) manifold covers over the manifolds, join (C) and (D) together with springs.

Step	Task/Activity
3.	Join manifold blanket directionally (A) to (C) and (B) to (D).

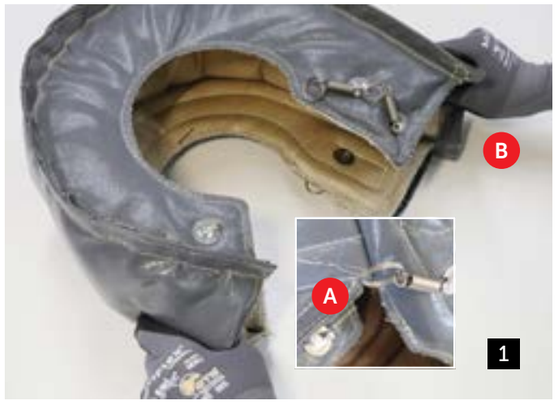


2.3 Installation

TURBO BLANKETS

PRE-FIT PREPARATION

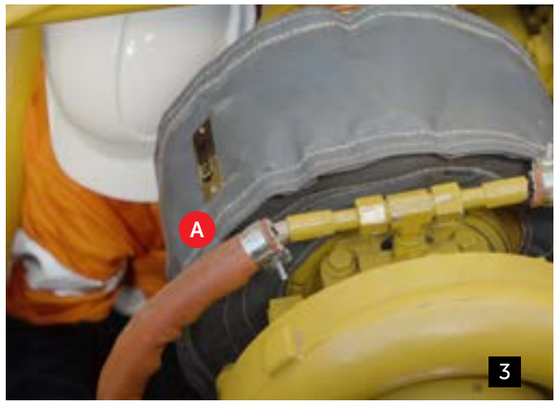
Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Feed the wire through the spring keyring to assist with the install as a pull-wire **(A)**. Open the blanket in preparation for fitting **(B)**.



TURBO INSTALLS

Step	Task/Activity
2.	Slide the turbo blanket over the turbo into the correct position. Pat the blanket to mould to the turbo shape.

Step	Task/Activity
3.	**Important:** Ensure the oil line is outside of the turbo blanket to prevent overheating and damage to the oil line **(A)**.

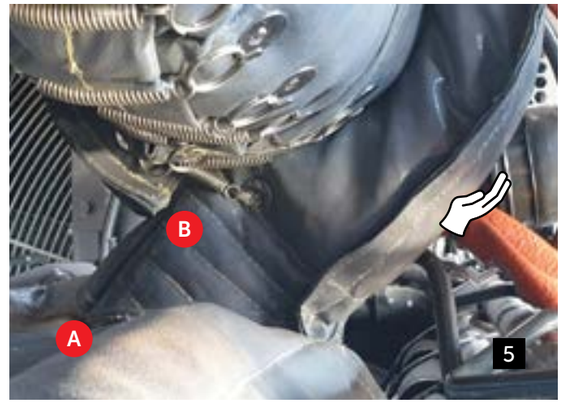


2.3 Installation

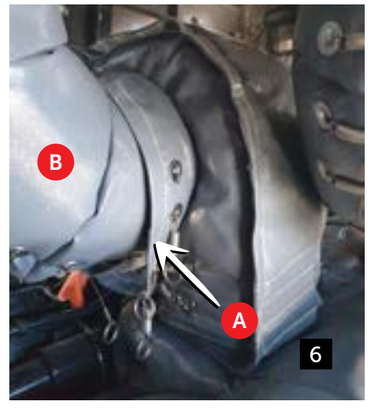
TURBO BLANKETS

Step	Task/Activity
4.	Connect all of the springs on the turbo blanket to the corresponding anchor. Remove the pull-wire from the keyring. You can also use a long flat blade screwdriver **(A)** with a notched end, ask our team about this.

Step	Task/Activity
5.	Ensure the turbo blanket mates to the manifold blanket and maximise blanket coverage. If required, pat the turbo blanket into position **(A)**. Inspect for gaps and maximise blanket coverage. Adjust if necessary **(B)**.

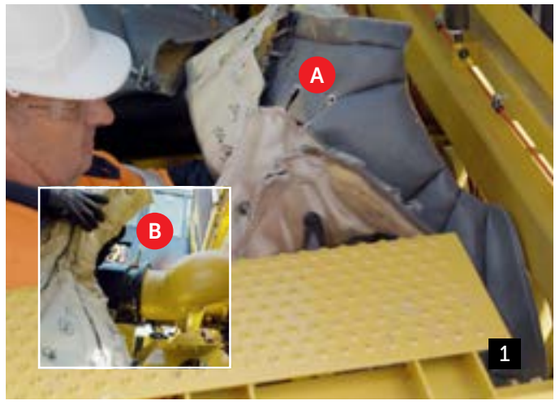


Step	Task/Activity
6.	If the blanket is fitted with an outlet flange cover **(A)**, ensure this section is on the outside of the engine pipe blankets **(B)**.



JUNCTION INSTALLS

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Use the cut-outs (A) as a reference to determine how the blanket sits. Make sure the thin blanket flap (B) is on the top side so it can be secured over the bottom. This ensures fluids can run-off.



Step	Task/Activity
2.	Feed the cover around the junction and into position. Before connecting the springs, massage blanket so the covers come around and meet.

Step	Task/Activity
3.	Start securing the springs. Start in the middle and work your way outwards, connecting springs to the corresponding anchors. This eliminates material bunching and enables adjustability while fitting.

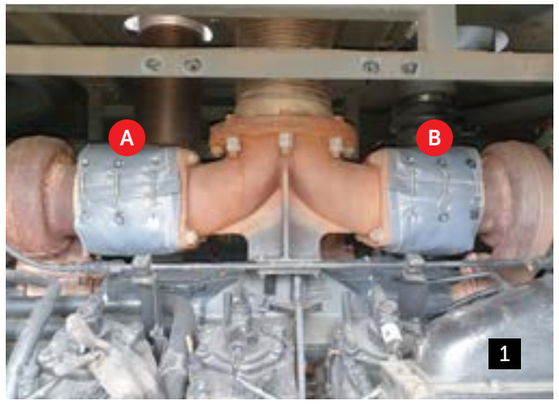
Step	Task/Activity
4.	Ensure the flap doesn't get caught in the springs. Make sure cut-outs (A) are fitted correctly around the brackets to minimise gaps. Ensure the flaps are on the same horizontal level as the other pieces you've fitted.

Step	Task/Activity
5.	Pull the drawstring cable (A) to secure the blanket on the overlap and secure it to the anchor. Make sure it's done up tight.

Step	Task/Activity
6.	Ensure junction pieces are firmly butted up to the turbo cover (A) or under the turbo collar if applicable.

JUNCTION INSTALLS (QSK60)

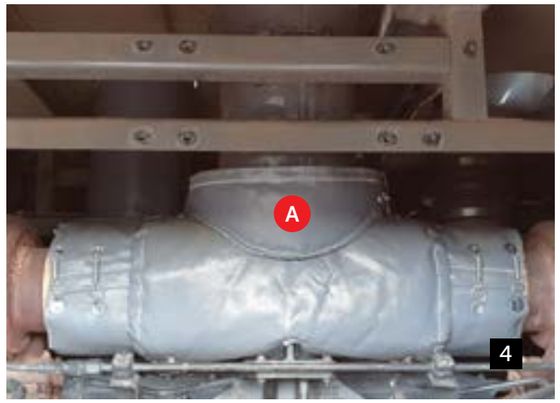
Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Fit pieces (A) and (B) around the bellows on the junction.



Step	Task/Activity
2.	Fit piece (A) around junction.

Step	Task/Activity
3.	Fit piece (A) around the flex engine pipe.

Step	Task/Activity
4.	Fit piece (A) around flange cover from junction to engine pipe.



Step	Task/Activity
5.	Fit turbo covers (A) and (B) to corresponding turbos.

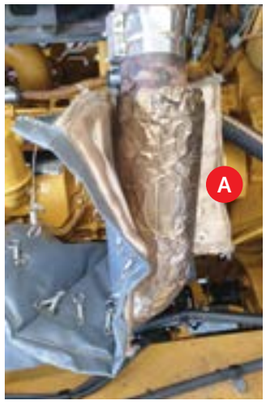
Step	Task/Activity
6.	Junction section blanket installation is complete.

2.3 Installation

ENGINE PIPE BLANKETS

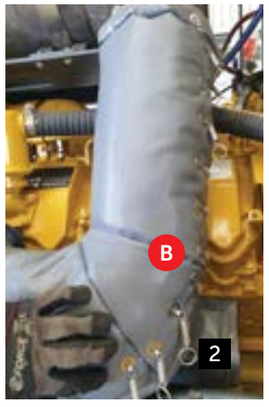
ENGINE PIPE INSTALLS

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Open the blanket **(A)** in preparation for fitting and wrap the blanket around the pipe **(B)**.



1

Step	Task/Activity
2.	Connect the centre spring to hold the blanket in place **(A)**. Connect the springs from the centre outwards to eliminate bunching of the material **(B)**.



2

Step	Task/Activity
3.	Massage the blanket to its final shape by patting to ensure maximum blanket coverage and a firm fit.

3

2.3 Installation

ENGINE PIPE BLANKETS

Step	Task/Activity
4.	Engine pipe covers should be installed with the thin blanket flap on top, so the flap can be secured over the bottom. Ensure the flaps are on the same horizontal level as the other pieces you've fitted. Avoid getting flaps caught in springs.

4

Step	Task/Activity
5.	It is important to follow the fitment order on the drawing. V-band clamp covers should be installed last. V-band covers must overlap engine pipe covers on both sides.

5

Step	Task/Activity
6.	During blanket fitment, the springs should align with the corresponding anchor hook below **(A)** before connecting the springs. If blankets are misaligned, don't use springs to force them to connect. Springs should not be overstretched.

6

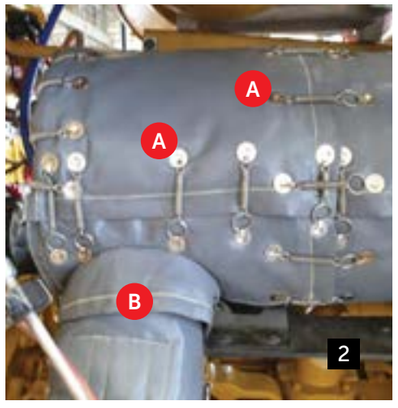
2.3 Installation

MUFFLER BLANKETS

MUFFLER INSTALLS

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Open the blanket in preparation for install and wrap around muffler. Identify the cut-outs for inlets and outlets.

Step	Task/Activity
2.	Connect all the springs using the techniques pictured **(A)**. Ensure the inlet flange is installed over the engine pipe cover **(B)**.



Step	Task/Activity
3.	Massage the blanket to its final shape by patting to ensure maximum blanket coverage and a firm fit. Ensure springs are connected to the corresponding anchor.

2.3 Installation

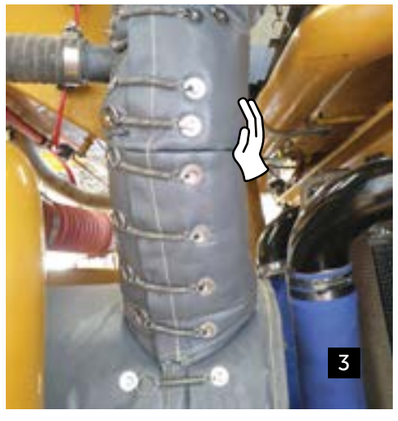
TAILPIPE BLANKETS

TAILPIPE INSTALLS

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Open the blanket in preparation for install and wrap the blanket around tailpipe **(A)**. Ensure the muffler outlet flange is installed underneath the tailpipe blanket **(B)**.

Step	Task/Activity
2.	Connect the centre spring to hold the blanket in place **(A)**. Connect the springs from the centre outwards to eliminate bunching of the material.

Step	Task/Activity
3.	Massage the blanket to its final shape by patting to ensure maximum blanket coverage and a firm fit. Ensure springs are connected to the corresponding anchor.

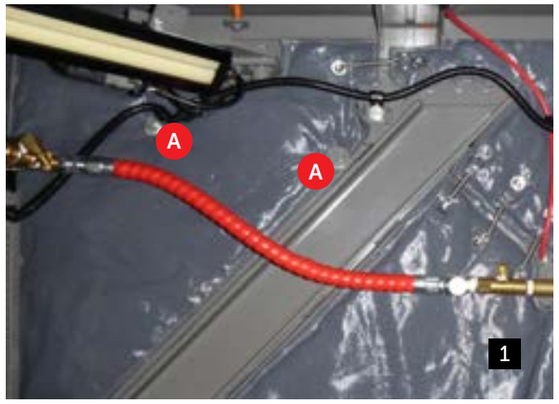


2.3 Installation

FIREWALL BLANKETS

FIREWALL INSTALLS (EX8000-7)

Step	Task/Activity
	Check drawing to ensure blankets are fitted in the correct order and location.
1.	Bolt firewall blanket to existing OEM bolts (A) in the steel wall between the engine bay and PTO room.



Step	Task/Activity
2.	Connect the centre spring and work outwards connecting the springs to the corresponding anchors.

2.3 Installation

FIRE SLEEVE FOR TURBO FEEDS

FIRE SLEEVE INSTALLS

Step	Task/Activity
1.	Turbo feed lines should have burst protection (A) installed. If turbo feeds are too short, contact the engine OEM for a longer feed line (to prevent rubbing).

Step	Task/Activity
2.	This is the product recommended for turbo lines (Part # 600-204).

2.4 Finalising Installation
CHECKLIST

FINAL INSPECTION

It is vital to conduct a final thermal blanket inspection and sign-off before allowing the machine to return to work.

- ☐ Ensure all blankets are fitted in the correct order
- ☐ Ensure a snug install is in place and maximise coverage of blankets between sections
- ☐ Check blanket sections overlap to minimise fluids leaking into lower section (consider gravity, upper sections should overlap lower sections)
- ☐ Ensure all springs are connected and tie-wires secured
- ☐ Check for sharp tie-wire tails and trim as required
- ☐ Take photos of the installed blankets

SCHEDULED SERVICING

Thermal blankets when fitted and maintained correctly will provide years of service. Mistreatment and third-party product exposure may shorten the product lifespan.

Blankets should be inspected and adjusted on a systematic basis to ensure maximum service life is attained. Aletek recommend a monthly visual condition inspection for effective fire mitigation. See Section 3 for more information.

Aletek can provide you with detailed audit reports ranging from an individual machine through to a full fleet analysis. We will highlight products and solutions that can offer improvements for machine aspects such as safety, efficiency, and durability. Contact Aletek for more information on fleet audit services.

INSTALLATION PROBLEMS?

Should your team experience blanket installation problems phone your Aletek Account Manager for assistance. To receive the best advice email or SMS photos first to sales@aletek.com.au then phone Aletek to discuss.

3 MAINTENANCE GUIDELINES

3.1 Proactive Maintenance

SERVICE CHECKLIST

SERVICE CHECKLIST – MONTHLY

A visual condition inspection is recommended monthly as part of your ongoing fire mitigation strategy. There is a cheat sheet available that includes this monthly checklist

- ☐ Examine blankets for damage
- ☐ Inspect blankets for flammable fluids
- ☐ Check blanket sections overlap, prevent fluids leaking into lower section (gravity)
- ☐ Ensure a snug install is in place and maximise coverage of blankets
- ☐ Check springs and tie-wires connected
- ☐ Take blanket condition report photos

Service Actions

- ☐ Replace damaged/missing sections
- ☐ Assess contaminated sections (by flammable fluids) – clean or replace
- ☐ Refit loose blankets, maximise coverage
- ☐ Connect disconnected springs, replace broken or missing springs

⚠ **Safety notice**

- ☐ Protect staff against hexavalent chromium Cr(VI) yellow/white dust, wear suitable PPE
- ☐ If Cr(VI) is identified safely dispose of contaminated blankets, clean* and replace

Aletek recommend an annual fleet audit report to assess blanket condition and heat critical engine and exhaust components. Make a booking with your Account Manager.

MAINTENANCE BEST PRACTICES

- Avoid walking on or applying excess pressure to fitted blankets, as sharp points underneath may pierce through
- Ensure adequate clearance around fitted blankets to avoid premature wear (e.g. engine bay doors closing on blankets, hoses rubbing on blankets)
- High pressure cleaners may cause surface damage to thermal blankets
- Report any spillages of oil or grease during servicing and maintenance
- Caution: Avoid starting machines with wet thermal blankets as excessive steam may appear and create the illusion of an engine fire
- Avoid cleaning blankets with degreasers as some may have flammable properties
- Some chemicals may damage blankets and could pose a fire hazard

THERMAL BLANKET REPLACEMENT

When replacing thermal blankets wear required PPE including gloves, safety glasses and a dust mask. If blankets are soaked in oil, diesel or coolant it is next to impossible to remove all traces of contaminants. Aletek recommends replacement as best practice.

- Damaged and excessively worn thermal blankets should be replaced
- When a blanket can no longer serve its intended purpose it should be replaced
- If oil, diesel or coolant pipes leak or burst and contaminate the blankets a thorough inspection should be conducted before clearing the machine for work

* Clean infected areas (ie wet methods or HEPA vacuuming), replace with new Cr(VI) free blankets

4

WORKSHOP GUIDE: GOOD FITMENT & CONDITION TIPS

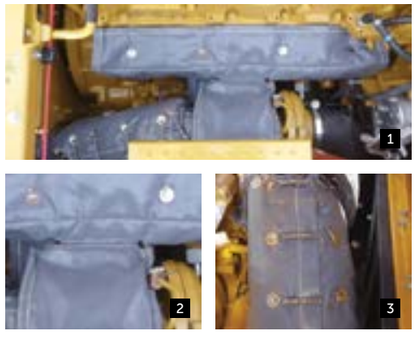
4.1 Guide: Good Fitment

CHEATSHEET AVAILABLE

DIGGERS

HELP YOUR SITE ACHIEVE MDG 15 COMPLIANCE*

Manifold needs tie-wire added

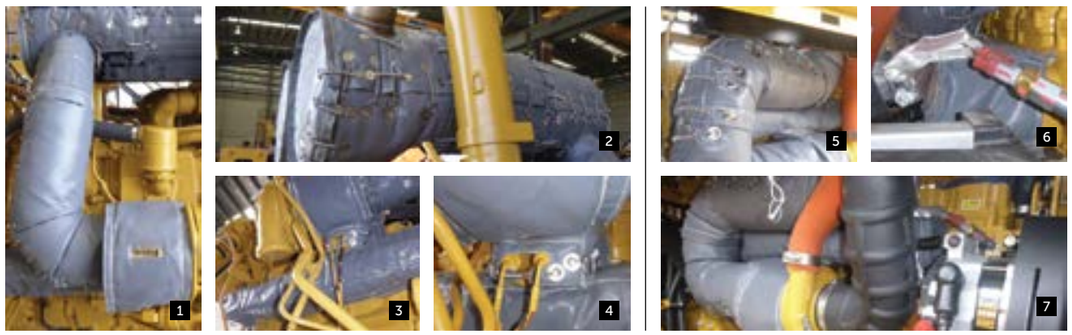


*150°C exhaust surface temp. (NSW Guideline)

PHOTOS 1-3 Cat 336 manifold, turbo and e/pipe blankets **PHOTOS 4-7** Hitachi 5600-6 manifold, turbo, e/pipe and firewall blankets

DOZERS & SOIL COMPACTORS

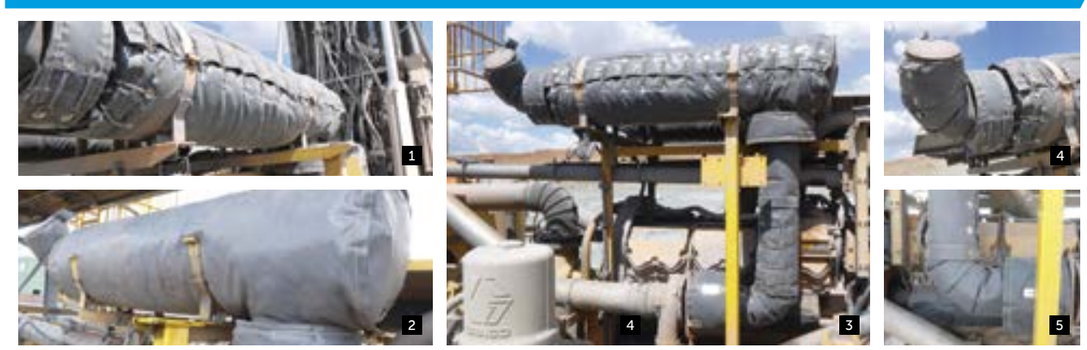
FITTER FRIENDLY WITH NON-ITCH SILICA MATERIAL



PHOTOS 1-4 Cat D11T manifold, turbo, e/pipe and muffler blankets **PHOTOS 5-7** Cat 815K manifold, turbo and e/pipe blankets

DRILL RIGS

DON'T LET YOUR CREW 'GET BIT' BY A HOT EXHAUST



PHOTOS 1-5 Atlas Copco PV275 turbo, engine pipe, muffler and tailpipe blankets. Manifold blankets available (not pictured).

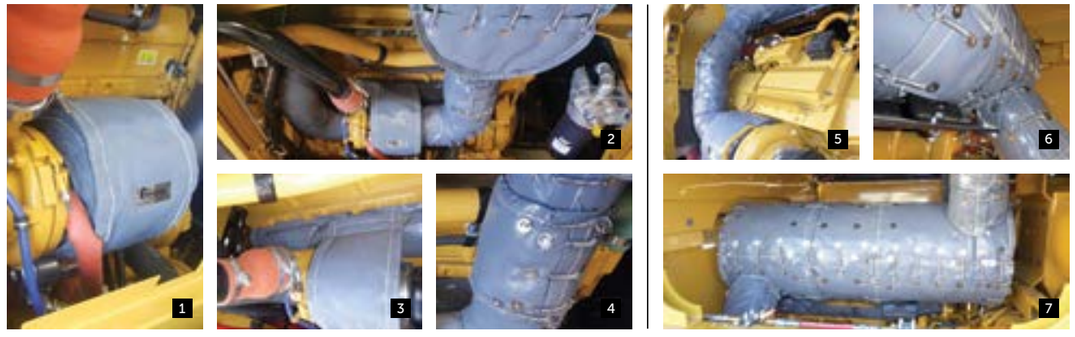
4.1 Guide: Good Fitment

CHEATSHEET AVAILABLE

GRADERS

REDUCE THE RISK OF EXPENSIVE ENGINE FIRES AND SHUTDOWNS

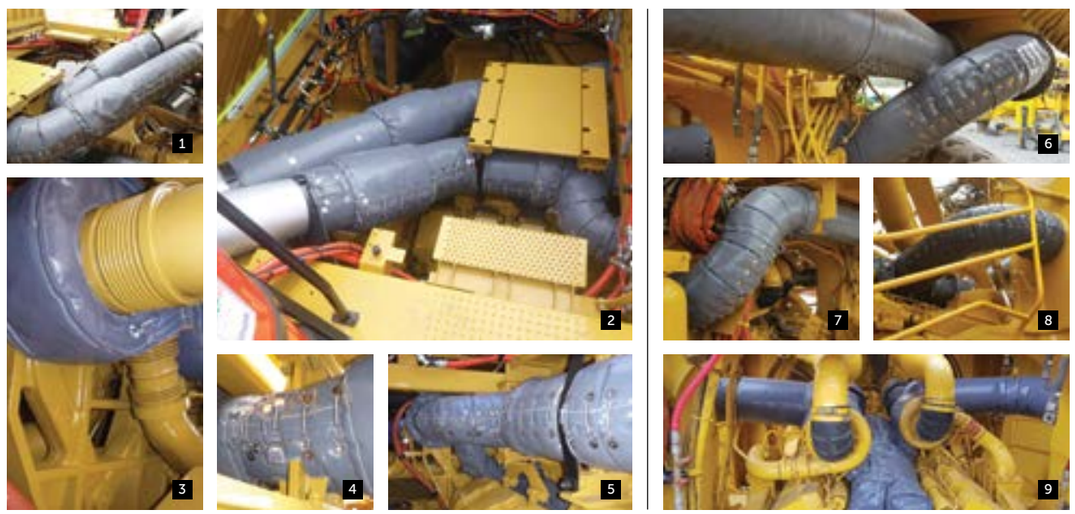
Tailpipe blankets not pictured



PHOTOS 1-4 **PHOTOS 5-7** Cat 24 manifold, turbo, e/pipe, muffler, t/pipe blankets

TRUCKS

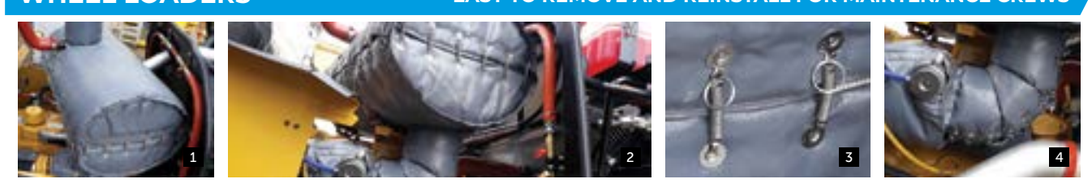
QUICK-FIT SPRINGS FOR REDUCED FITTING TIMES AND PERFECT TENSION



PHOTOS 1-5 Cat 793F manifold, turbo, junction, e/pipe blankets **PHOTOS 6-9** Komatsu 830E manifold, turbo, junction, e/pipe blankets

WHEEL LOADERS

EASY TO REMOVE AND REINSTALL FOR MAINTENANCE CREWS



PHOTOS 1-4 Cat 966M turbo, engine pipe, muffler and tailpipe blankets. Manifold blankets available (not pictured).

4.2 Guide: Blanket Condition

CHEATSHEET AVAILABLE

The following visual guide depicts examples of typical thermal blanket conditions. This sheet should be viewed alongside our service checklist on our Fitting Tips Cheat Sheet and/or Blankets Install & User Guide. Aletek recommends a monthly visual condition inspection as part of your ongoing fire mitigation strategy.

ACCEPTABLE CONDITION

ACTIONS – MONITOR/FIX AS NOTED

Blankets in acceptable condition may have cosmetic blemishes but are still able to serve their intended purpose. As these are a wear and tear product condition should be monitored monthly for future re-fitting or replacement.

SOILED BUT FUNCTIONAL

ABOVE Residual dirt build-up and low-level soot are typical (1,2,6). Investigate prominent soot on blankets for engine pipe leaks (3,7). Eliminate gaps and refit blankets (8) for a snug-fit and maximise coverage (4). Monitor blanket condition during ongoing maintenance.

AVERAGE CONDITION

ACTIONS – REPLACE WITHIN 6-MONTHS

Blankets in average condition should be monitored and replaced within 6-months. Issues such as missing springs or fitment issues should be resolved now. See our Fitting Tips sheet and Install & User Guide for maintenance tips.

WORN – MONITOR CONDITION, REPLACE SOON

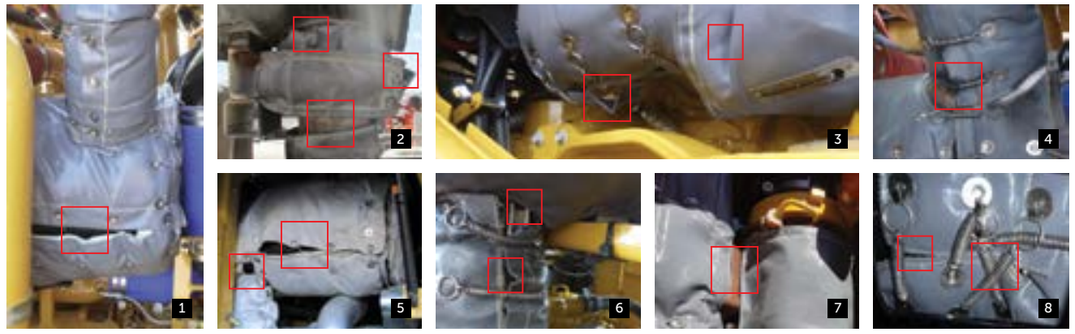
ABOVE Fix and refit blankets to avoid hot spots from gaps (1,6,8). Refit/replace stretched springs and loose tie-wire (4,6,8). Monitor and schedule replacement for wear (9), soot marks (2,3,8-11) and irreparable/loose fitments (8). Investigate burn marks for exhaust leaks (1,8).

4.2 Guide: Blanket Condition

CHEATSHEET AVAILABLE

GOOD CONDITION – FITMENT ISSUES

ACTIONS – FIX AS NOTED



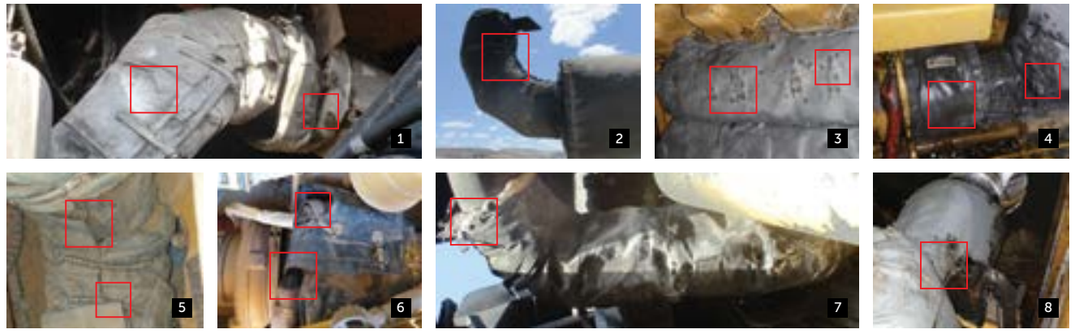
PHOTOS 1-8 Poor fitment (1,3,8), excessive gaps (2-5,7), and poor install techniques (8) create hot spots. Eliminate gaps and ensure blankets are snug-fitting and maximise coverage. Check springs are connected, tie-wires secured, and replace missing springs.

POOR CONDITION

ACTIONS – REPLACE/FIX NOW

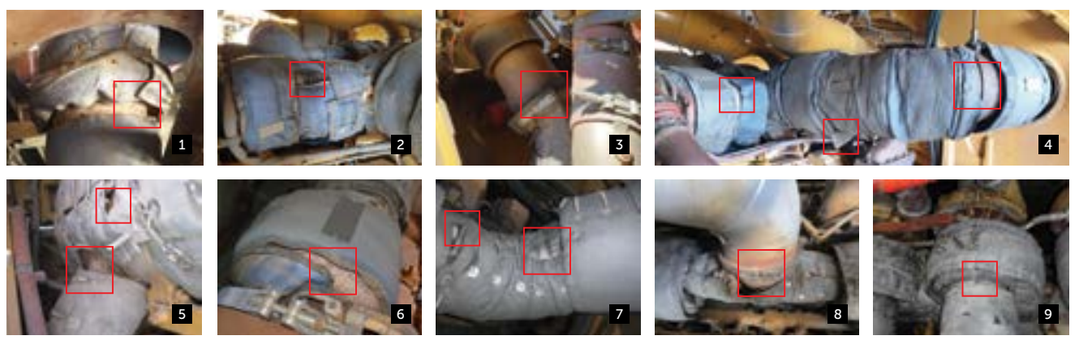
Blankets in poor condition should be fixed/replaced now. Rectify poor fitments immediately. If blankets are soaked in oil, diesel or coolant it is almost impossible to remove all traces of contaminants – replace now.

DAMAGED – REPLACE NOW



PHOTOS 1-8 Replace blankets that are damaged (1,7), oil/fuel contaminated (4,7), excessively worn (7,8) and poor fitting (5). Replace damaged sections and contaminated sections (by flammable fluids) that can't be sufficiently cleaned.

POOR FIT/DAMAGED – FIX NOW



PHOTOS 1-9 Assess poor fitment alongside blanket condition. Fix gaps (5,7) and assess if fit-for-purpose. Replace overworn and baggy-fit blankets (2,4,8). Replace damaged blankets and missing sections (3,6,9). Consider upgrading tie-wire to springs for a snug fit (1,2).

5

PRODUCT WARRANTY

5.1 Product Warranty

WARRANTY FORM

We provide a 12-month warranty on manufacturing defects and a direct-fit replacement guarantee for thermal blankets. For warranty claims fill in and submit the form on the Aletek website at **www.aletek.com.au/about-us/warranty-form**

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