

# FAST FITTING

**HEAVY EQUIPMENT ACCESSORIES**



**LIMEDA**  
INTERNATIONAL



**Engineered For Safety, Built For Reability**



# 1ST FITTING

HEAVY EQUIPMENT ACCESSORIES

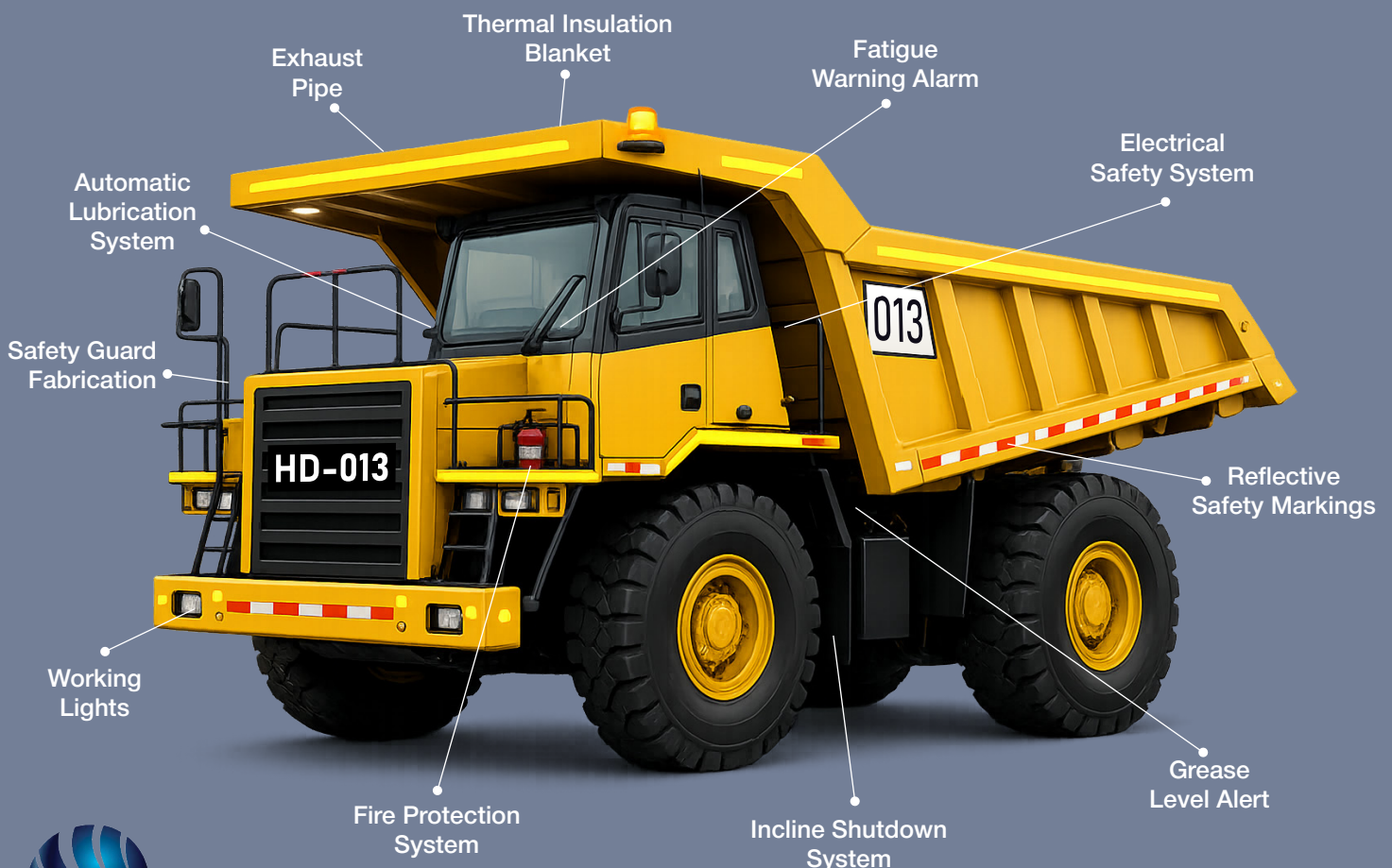
## 1st Fitting Heavy Equipment Accessories

Protecting Assets. Securing Operations. Supporting Safety Excellence. 1st Fitting delivers OEM grade aftermarket solutions specifically developed to support mining owners in managing operational risk, protecting high value assets, and maintaining safety compliance across large scale mining operations.

Designed for heavy dump trucks and critical production equipment operating under continuous and extreme conditions.

## Why Mining Owners Choose 1st Fitting

- OEM grade aftermarket quality
- Designed for continuous heavy duty mining operations
- Factory fit installation concept
- Supports HSE policies and site safety management systems
- Helps reduce operational risk and protect capital assets



# 1ST FITTING

HEAVY EQUIPMENT ACCESSORIES

## 1 Critical Safety Systems

Engineered to reduce accident risk, improve situational awareness, and protect personnel and assets.

Power Distribution Unit

### Automation devices :

- Fatigue Warning Alarm
- Speed Limiter Alert
- Incline Shutdown
- Grease Level Alert

### Safety System :

- LOTO BOX (Lock Out Tag Out Box)
- Strobe Light
- Wheel Chock

## 2 Asset Identification Site Safety Marking

Supporting asset control, traceability, and site safety compliance.

### Identity Marking

- Fleet numbers, unit ID, nameplates, and durable labeling to ensure clear asset identification and effective fleet management.

### Safety Marking

- Reflective markings, warning decals, and hazard identification to improve visibility and hazard awareness on site.

Designed to withstand dust, vibration, UV exposure, and harsh mining environments.

## 3 Fire & Heat Risk Mitigation

Protecting equipment and operations from fire related incidents.

- Automatic Fire Suppression System
- APAR – Fire Extinguisher
- Thermal Insulation Blanket

Designed to reduce fire risk and manage heat exposure in critical engine and exhaust areas.

## 4 Reliability & Maintenance Support

Enhancing equipment reliability while improving maintenance efficiency.

- Auto Lubrication System
- High Performance Working Light

Helps minimize unplanned downtime and supports

## 5 Equipment Protection & Maintenance Support

### Safety Guard – Custom Fabrication

- Custom-engineered protective guards that shield critical equipment from impact, debris, accidental contact, and mining hazards, tailored to specific equipment and operational needs.

## 6 Fueling Safety & Operational Efficiency

### Bi-Fuel Conversion for Diesel Engines

- Use Gas instead of Diesel to reduce fuel cost and emissions, while keeping diesel performance and automatic fallback to 100% diesel whenever required.

### Fast fill System

- Custom engineered protective guards to safeguard critical components against impact, debris, and operational hazards.

## 7 Optional Equipment

- Cabin Air Conditioner
- Heavy Duty Exhaust Pipe
- Radio Communication

# I. Critical Safety System Automation Devices

## Proactive Safety Control for Heavy Equipment Operations

The **Automation Devices** within the **1st Fitting Critical Safety System** are designed to actively monitor operator condition, machine behavior, and operating parameters in real time. These systems function as **preventive and corrective safety controls**, reducing human error, mechanical misuse, and high risk operational conditions before incidents occur.



### Incline Shutdown

Automatically intervenes or shuts down equipment operation when unsafe slope or incline limits are exceeded.

#### Safety Impact:

- Prevents roll over accidents
- Protects equipment stability on ramps and uneven terrain
- Critical for dump truck operations in mining environments

### Fatigue Warning Alarm

Monitors operator alertness levels and provides early warnings when signs of fatigue are detected.



#### Safety Impact:

- Reduces risk of operator error
- Supports long shift and continuous operation safety
- Enhances operator awareness and response time

### Speed Limiter Alert

Monitors unit speed and provides alerts when predefined speed thresholds are exceeded.



#### Safety Impact:

- Helps prevent overspeed incidents
- Supports site speed regulations
- Reduces accident risk in high traffic mining areas

### Grease Level Alert

Monitors lubrication levels on critical components and provides alerts when grease levels fall below safe limits.



#### Safety Impact:

- Prevents component failure due to insufficient lubrication
- Reduces mechanical breakdown risk
- Supports preventive maintenance strategy

## Why Automation Devices Are Critical Safety Systems

These automation devices are classified as **Critical Safety Systems** because they:

- Actively monitor and respond to unsafe conditions
- Reduce reliance on manual judgment alone
- Prevent incidents before they escalate into accidents
- Support compliance with mining HSE standards

## Together they form a closed loop safety



### Category

Heavy Dump Trucks • Mining Equipment • Heavy-Duty Industrial Assets



### Key Benefits for Mining Owners

- Improved operational safety consistency
- Reduced incident and accident probability
- Enhanced compliance with site safety policies
- Lower unplanned downtime from preventable failures
- Increased lifespan of critical components

# I. Critical Safety Package

## Integrated Safety Solutions for Mining Equipment

The **1st Fitting Critical Safety Package** combines three essential safety devices **LOTO Box**, **Wheel Chock**, and **Strobe Light** into a unified solution designed to control hazardous energy, prevent unintended movement, and enhance visual awareness during heavy equipment operation and maintenance.

This package is engineered to support mining owner HSE objectives, reduce operational risk, and protect high-value assets and personnel.



### Wheel Chock

#### Unintended Movement Prevention

A heavy-duty wheel securing device used during parking, maintenance, and refueling.

Prevents uncontrolled unit movement on flat or inclined surfaces.

#### Risk Controlled:

- Rolling or shifting equipment
- Crush and strike hazards during servicing



## Safety Package Components



### LOTO Box (Lock Out Tag Out Box)

#### Hazardous Energy Control

A centralized Lock Out Tag Out system designed to secure isolation keys during maintenance and repair activities.

Ensures equipment cannot be re-energized until all authorized personnel have completed their tasks safely.

#### Risk Controlled:

- Accidental equipment startup
- Exposure to electrical, hydraulic, or mechanical energy

## Why This Safety Package Matters for Mining Owners

Together, these three components address **three critical risk categories** in mining operations:

Risk Category	Controlled By
Hazardous Energy Isolation	LOTO Box
Unintended Equipment Movement	Wheel Chock
Situational Awareness & Visibility	Strobe Light

- Supports site LOTO procedures
- Enhances compliance with HSE and safety audits
- Reduces likelihood of severe incidents and downtime
- Protects workforce and capital assets

### Strobe Light

#### Active Visual Warning & Awareness

High visibility warning light to alert surrounding personnel of equipment presence, movement, or operational status, especially in high traffic and low visibility mining areas.

#### Risk Controlled:

- Collision risk
- Poor visibility in active work zones

## Ideal Applications

- Heavy dump truck maintenance
- Refueling zones
- Workshop and field servicing
- High-traffic mining areas

## Category

Safety Devices • Safety Management Systems

# 2. Asset Identification Site Safety Marking

## Supporting Asset Control, Traceability, and Site Safety Compliance

The **Asset Identification & Site Safety Marking** system is designed to **enhance equipment visibility, asset traceability,** and on-site safety awareness across mining and heavy industrial operations.

This system supports effective fleet management while reinforcing compliance with site safety and HSE requirements.

**Asset Identification & Safety Marking.** Durable identity and safety marking solutions that support asset traceability, improve visibility, and enhance hazard awareness across mining and heavy industrial operations.



### Safety Marking

Reflective markings, warning decals, and hazard identification designed to improve unit visibility and hazard awareness in active work zones.

#### Safety marking helps to:

- Increase awareness of potential hazards
- Improve visibility in low-light and dusty conditions
- Reduce the risk of incidents in high-traffic operational areas

### Identity Marking

Fleet numbers, unit IDs, nameplates, and durable labeling solutions that ensure clear and consistent asset identification across the site.

#### These markings support:

- Accurate asset tracking and traceability
- Effective fleet management and reporting
- Clear unit recognition for operators and maintenance teams

## Designed for Harsh Environments

All identity and safety marking components are engineered to withstand:

- Heavy dust and debris
- Continuous vibration
- UV exposure
- Extreme weather and harsh mining environments

Ensuring long-term durability and consistent visibility throughout the equipment lifecycle.

## Ideal Applications

- Heavy dump truck maintenance
- Refueling zones
- Workshop and field servicing
- High-traffic mining areas

### Category

Asset Identification • Site Safety Marking Systems

# 3. Fire & Heat Risk Mitigation

## Integrated Fire & Heat Protection

Protecting equipment, personnel, and operations from fire-related incidents and excessive heat exposure in mining and heavy industrial environments.

This system is designed to minimize fire hazards, improve emergency response capability, and reduce heat transfer in critical operational areas, supporting safer operations and improved equipment reliability.

### Automatic Fire Suppression System

#### Active Fire Detection & Suppression

An automated protection system designed to detect and suppress fire in critical equipment compartments such as engine bays, hydraulic systems, and fuel areas before incidents escalate.

#### Risk Controlled:

- Fire escalation in heavy equipment
- Damage to critical assets and operational downtime
- Threats to operator and personnel safety



### APAR – Fire Extinguisher Emergency Fire Response

Portable fire extinguishing equipment designed to provide immediate first-response capability for small and localized fires during operations, maintenance, and emergency situations.

#### Risk Controlled:

- Delayed emergency response
- Spread of localized fire incidents
- Personnel injury and equipment damage



### Thermal Insulation Blanket

#### Heat Protection & Exposure Reduction

A high-temperature insulation solution designed to reduce radiant heat exposure and protect critical engine, exhaust, and high-temperature components.

#### Risk Controlled:

- Excessive surface temperatures
- Heat-related fire hazards
- Component degradation from thermal exposure

## Why This Fire & Heat Protection System Matters for Mining Owners

These components address critical fire and heat-related risks commonly found in mining and heavy industrial operations:

- Prevents catastrophic fire incidents
- Protects personnel and critical assets
- Minimizes downtime and equipment damage
- Supports HSE compliance and operational safety
- Protect both personnel and high value assets

### Ideal Applications

- Heavy equipment engine and exhaust areas
- Hydraulic and fuel system protection
- Workshops, maintenance, and refueling zones
- Active mining and processing operations
- Protect both personnel and high value assets

### Category

Fire Protection • Heat Risk Management Systems

# 4. Reliability & Maintenance Support

## Reliability & Maintenance Support

Enhancing equipment reliability, operational availability, and maintenance efficiency across mining and heavy industrial operations. This system is designed to support preventative maintenance practices, improve equipment performance, and reduce unplanned downtime in demanding operational environments.



Capacity :

16kg    25kg    40kg    60kg    100kg



### Auto Lubrication System

#### Automated Lubrication & Component Protection

An automatic lubrication system designed to deliver consistent grease distribution to critical moving components during equipment operation.

#### Safety Impact:

- Reduces risk of premature component failure
- Ensures consistent lubrication on critical moving parts
- Minimizes unplanned downtime and maintenance-related incidents

### High Performance Working Light

#### Operational Visibility & Maintenance Support

High-intensity working lights designed to improve visibility during operations, inspection, and maintenance activities, especially in low-light, night-shift, and harsh mining environments.

#### Safety Impact:

- Improves visibility during operation and servicing
- Reduces risk of operational and maintenance incidents
- Enhances work efficiency in low-light environments

## Why This Fire & Heat Protection System Matters for Mining Owners

These components support two critical operational priorities in mining operations:

- Supports preventative maintenance programs
- Reduces unplanned downtime and maintenance costs
- Improves equipment reliability and operational efficiency
- Enhances safety and productivity during maintenance activities

### Ideal Applications

- Heavy equipment lubrication and component protection
- Workshop and field maintenance activities
- Night-shift and low-light operations
- Inspection, servicing, and high-utilization mining equipment

### Category

Reliability Systems • Heat Risk Management Systems

# 5. Equipment Protection & Maintenance Support

## Equipment Protection & Operational Safety

Protecting critical equipment components from operational hazards, impact, and environmental exposure in mining and heavy industrial operations. This system is designed to improve equipment durability, reduce damage-related downtime, and enhance operational safety through custom-engineered protective solutions.



Cabin Guard



Handrail



Stairway

### Safety Guard – Custom Fabrication

#### Component Protection & Operational Safety

Custom-engineered protective guards designed to shield critical equipment components from impact, debris, accidental contact, and operational hazards during mining activities.

#### Risk Controlled:

- Damage from rocks, debris, and external impact
- Exposure of critical components to operational hazards
- Personnel contact with moving or hazardous equipment parts

### Why This Equipment Protection System Matters for Mining Owners

Protective guarding plays a critical role in maintaining equipment reliability and operational safety in harsh mining environments:

- Protects against impact and debris damage
- Shields critical components from operational hazards
- Reduces personnel contact with hazardous moving parts

### Ideal Applications

- Engine and hydraulic component protection
- Undercarriage and rotating equipment guarding
- Debris and impact protection areas
- High-impact mining and hauling operations

### Category

Equipment Protection • Custom Fabrication Solutions

# 6. Fueling Safety & Operational Efficiency

## Intelibifuel

### Bi Fuel Conversion for Diesel Engines

Use Gas instead of Diesel to reduce fuel cost and emissions, while keeping diesel performance and automatic fallback to 100% diesel whenever required.

Designed for retrofit of conventional diesel engines and regulates gas introduction safely without interfering with the existing engine controller.



### Why Bi-Fuel (Dual Fuel)?

- Up to 70% diesel substitution by gas (application dependent)
- Dramatically reduced operational costs
- Seamless and automatic changeover to 100% diesel operation
- Maintains diesel engine output and transient performance
- Significant reduction in emissions (typical NOx and CO reductions, application dependent)
- Fully automatic compensation for changes in gas quality, pressure, and temperature

### Typical Diesel Substitution

Up to 70% diesel consumption can be replaced by gas (application dependent).

### Fuel Flexibility

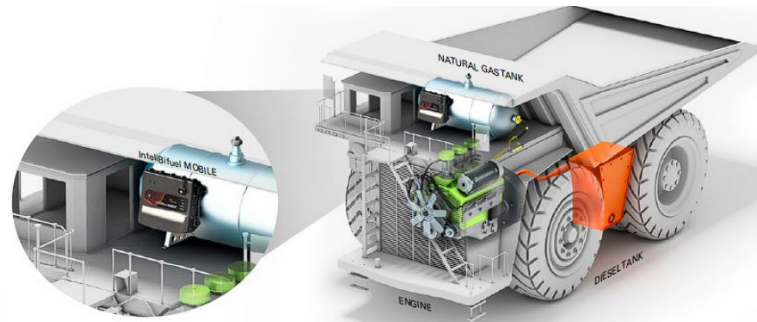
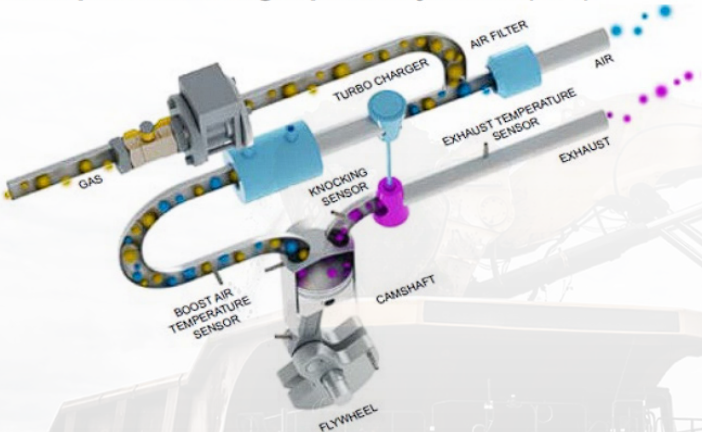
- CNG / LNG
- LPG
- Flare gas (where available)

## Technology Options

**Low-Pressure Fumigation.** Gas admission before turbocharger, suitable for fixed speed gensets; typical pressure range 0.150–0.450 bar.  
**High-Pressure Single Point Injection (SPI).** Injection after intercooler / post-turbo with sequential gas control; typical range 4–9 bar for truck/mobile applications (ideal for CNG/LNG solutions).

### Dyno test configuration

#### Low pressure single point injection (SPI)



### Typical Emission Reductions Intelibifuel

**NOx:** 5–40% reduction

**CO:** 5–20% reduction

**Runtime:** extended (example: up to 10 days without refueling with 70% substitution, application dependent)

## Where It Works

**Single-speed (Stationary):** gensets for Oil & Gas, Mining, Rental, and standard power generation

**Variable-speed (Mobile):** mining trucks, diesel locomotives (main/aux), fracking pump trucks, drill rigs, and heavy-duty mobile engines

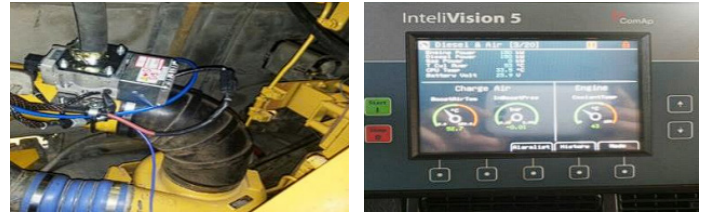


# Safety, Components & Project Delivery

Engine protection is built into Bi-Fuel mode. If parameters exceed safe limits (e.g., high temperature, low diesel, or knocking), the system reduces or shuts off gas without reducing engine power output.

## Engine Protection

Example:  
CAT C-32 Truck Conversion



Exhaust temperature monitoring: modified exhaust manifold and turbo outlet; **12 cylinder temperature sensors** plus **2 downstream turbo thermocouples**.  
Knock detection: **12 Denox knock sensors** installed on cylinder heads with thermal shielding.

### Core Components

**Gas Train:** ball valve, filter, gas pressure regulator, dual shut-off valves, pressure & temperature switches.  
**Control Panel** (example): IBF-Mobile unit, Denox controller, PWM module, IntelliVision display, emergency stop, and harnesses to connect sensors to the controller.

# Reference Project Snapshot (Mine Haul Truck)

Example project: **CAT 777E dump truck** (payload **102 ton**) with **CAT C-32** engine rated 749 kW. Project targets include cost saving and emission control while keeping original diesel performance, ensuring engine safety, and avoiding any impact on vehicle control systems such as automatic transmission/gear shifting.



## Engine Protection

### Typical Project Steps

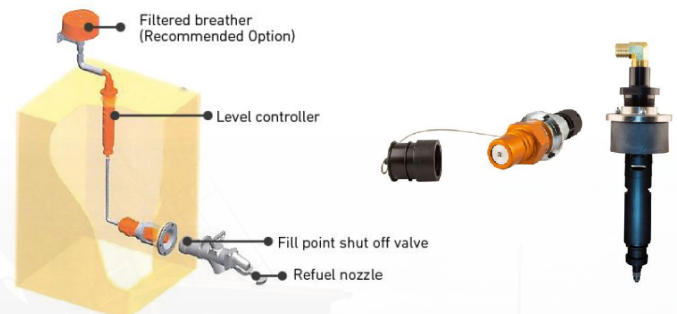
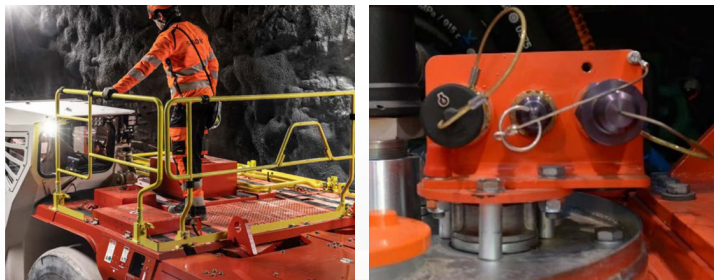
- Dyno test (diesel + gas mapping)
- Installation on equipment
- Commissioning
- Performance monitoring
- Field data evaluation

Sample evaluated data (CAT C-32) shows diesel savings at multiple load points. Examples include:

- 600 kW @ 85% APP: 64 L/hr diesel saved
- 600 kW @ 100% APP: 60 L/hr diesel saved
- 500 kW @ 100% APP: 66 L/hr diesel saved

Actual savings depend on engine condition, duty cycle, gas quality, and safe knock/temperature limits.

# Fast Fill System



Custom-engineered guards protecting critical fast fill components from impact, debris, and operational hazards to improve equipment reliability, reduce downtime, and enhance operational safety.

### Safety Impact:

- Protects fast fill components from impact and debris
- Reduces downtime from component damage or failure
- Enhances operator and maintenance safety
- Improves equipment durability and reliability

## Ready to assess your engine or fleet?

Send engine model, rating, duty cycle, and available gas type/pressure. SKYS will coordinate a feasibility study and conversion plan with ComAp InteliBifuel solutions.

**Contact :**  
**info@limesda.co.id**  
**+62 113 20 354**

# 7. Optional Equipment

## Operational Support for Comfort, Communication & Efficiency

Supporting operator comfort, operational efficiency, and communication reliability across mining and heavy industrial operations. This equipment is designed to enhance daily operational performance, improve working conditions, and support effective coordination in demanding mining environments.



Cabin A/C Blower DC Compressor (Outside cabin)

### Cabin Air Conditioner

#### Operator Comfort & Environmental Control

A heavy-duty cabin air conditioning system designed to maintain comfortable cabin temperatures and improve operator working conditions during extended operations in hot and harsh environments.

#### Safety Impact:

- Reduces operator fatigue from heat exposure
- Improves operator focus and comfort during operation
- Maintains safer cabin working conditions



### Heavy - Duty Exhaust Pipe

#### Exhaust System Durability & Performance

A reinforced exhaust pipe system designed to withstand high-temperature operation, vibration, and harsh mining conditions while supporting reliable engine exhaust performance.

#### Safety Impact:

- Improves exhaust system reliability in harsh environments
- Reduces heat and vibration-related component damage
- Minimizes operational disruption from exhaust failure



### Radio Communication

#### Operational Coordination & Safety Communication

A communication system designed to support reliable coordination between operators, supervisors, and field personnel during mining and maintenance activities.

#### Safety Impact:

- Improves communication in active work areas
- Supports faster response during operational and emergency situations
- Enhances coordination in high-traffic mining operations

### Why This Fire & Heat Protection System Matters for Mining Owners

These optional components support operational comfort, communication reliability, and equipment performance in mining

- Improves operator comfort and productivity
- Supports reliable communication and coordination
- Enhances equipment durability in harsh environments
- Contributes to safer and more efficient operations

### Ideal Applications

- Heavy equipment operator cabins
- Mining haul trucks and support vehicles
- Field communication and dispatch operations
- Remote and high-demand mining operations

### Category

Optional Equipment • Operational Support Systems

# Safety Devices Packaged Application



# Galleries





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