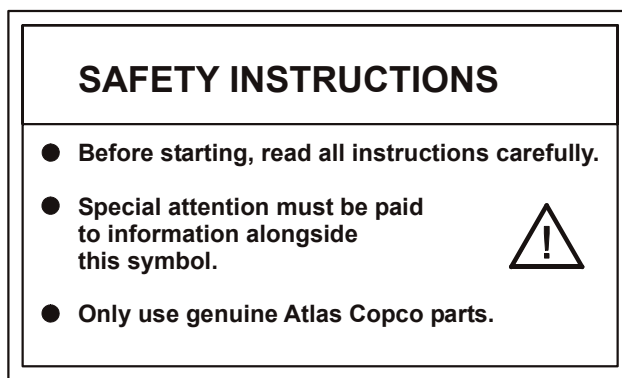


Atlas Copco Minetruck

MT431B & 436B

Operators Manual





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Original instruction

**Atlas Copco Rock Drills AB
SE-70191 Örebro, Sweden**

Table of Contents

Chapter 1: Introduction

General.....	1
Before Starting	3
Warnings.....	3
Description.....	3
Heading.....	3
Safety Labels	4
Engine Compartment Guards	7
Know Your Vehicle	8
Model Identification.....	8
Terminology	9
Standard MT431B/MT436B/MT436LP	9
Left and right side	10
Teletram	11
Identification Numbers	12

Chapter 2: Safety

General Safety Instructions	13
Risk Areas	15
Description	15
Safe Zone.....	15
Risk Area	15
Repositioning	15
Working in the Risk Area	15
Description	15
Specific expertise.....	15
Steps to take.....	15
Starting and Driving the Vehicle	17
Parking and Stopping	19
Parking the Vehicle and Stopping the Engine ..	19
Safety Equipment	21
Emergency Exit.....	21
Cabin.....	21
Side seated cabin	21
Vehicle Safety Guards	21
Wheel Chocks	22
User safety guidelines	22
Use of Wheel Chocks.....	22
Positioning	22
Considerations	23
Stability	25
Static Angles of Inclination	25
Minetruck.....	25
Driving On Slopes	25
General	25

The Operator.....	25
Speed	25
Ground conditions and terrain.....	26
Direction of travel	26
Vehicle equipment	26
Load	26
Noise and Vibration	27
Declared Values	27
Noise	28
Declaration Noise MT436B	28
Declaration Noise MT436B LP	28
Risk Assessment.....	29
Combinations	29
Vibration	30
Declaration Vibration	30
Risk assessment	30

Chapter 3: Controls & Indicators

Introduction	31
Symbols	33
Identification	36
Vehicle Nameplate.....	36
Instrument Panels	37
SS Canopy/Cabin (MT431 and MT436B)	37
FS Cabin (MT 431 and MT436B)	38
FS Canopy LP (MT436B)	39
Gauges	40
General	40
Accumulator pressure.....	40
Transmission pressure.....	40
Converter oil temperature	40
Engine coolant temperature	40
Engine oil pressure	41
Hourmeter	41
Tachometer.....	41
Voltmeter	41
Indicators and Warning Lights	42
Check engine light	42
Stop engine warning light	42
Converter APC lock-up indicator.....	42
Converter lock-up light.....	42
Engine retarder/jake brake light.....	42
Auto transmission warning light.....	42
Switches and Buttons	43
Brake override knob	43
Circuit breakers.....	43
Horn button.....	43
ON/OFF/START switch	43
Converter lock-up button	43

Converter lock-up release	43	Front/rear seat adjustment control	56
Retarder engine	43	Operator weight control	56
Light switches	44	Seat Belts	56
Vehicles with rocker switches	44	Fasten seat belt	56
Vehicles with rotating or toggle switches	44	Release seat belt	56
Override button	44		
Detroit diesel engine	44		
Override procedure	44		
Battery isolation switch	44		
Parking brake button	45		
Overhead console in vehicles with SS Cabin compartment	45		
Air conditioner on/off	45		
Climate control	45		
Heater Hi/Lo	45		
Defroster switch	45		
Dome light switch	45		
Windshield washer controls	45		
Emergency steering (option)	46		
Overhead Console (SS Cab)	46		
Dump Control Lever	46		
Steering Control	47		
Wheel steering control	47		
Monostick steering control	47		
Transmission control	47		
Dual function lever	47		
APC100 Automatic control	47		
Throttle control	47		
Accelerator pedal	47		
Hand and Foot Controls	49		
SS Canopy (MT431 and MT436B)	49		
FS Cabin (MT431 and MT436B)	50		
FS Canopy LP (MT436B)	51		
Foot Controls	51		
Brakes	51		
SAHR Brake Pedal	51		
Miscellaneous Systems	53		
Video Systems (option)	53		
Fire Suppression System	53		
Actuator	53		
SS Canopy	53		
FS Canopy LP (MT436B)	54		
System description	54		
In the event of fire	54		
Portable Fire Extinguisher	54		
Brake Pump-Off Hand-Pump	55		
MT-436B	55		
SAHR Brake override system	55		
Seat Controls	56		
Armrest controls	56		
Backrest control	56		
Seat height adjustment, front and rear	56		
		Chapter 4: Operating Instructions	
		Introduction	57
		Safety First	59
		Safety Instructions	59
		Read the operator's manual	59
		Vehicle Inspection	59
		Know your work area	59
		Never use controls as mounting assists	59
		Check your safety equipment frequently	59
		When traveling up or down a ramp	59
		Give loaded vehicles the right-of-way	59
		Driving Practices	60
		Pre-Starting Procedures	61
		Walk-Around Inspection	61
		Prestart Checks	61
		Check engine oil level	61
		Check radiator coolant level	61
		Vehicle Start-Up	63
		Start the engine	63
		Post-start Checks	63
		Transmission oil level	63
		Fluid leak check	63
		Test the service brakes	63
		Test the brakes	64
		Test the parking brake system in position 1	64
		Test the parking brake system in position 2	64
		Test the Service Brakes	64
		Check dump box operation	65
		Check lights	65
		Rear light/Back-up alarm	65
		Driving	67
		Parking and Engine Shut-down	67
		Articulation safety lock	67
		Vehicle Operation	69
		Safety when driving	69
		Warm-up in cold weather	69
		Engine Warning Lights	69
		Check engine light - yellow	69
		Stop engine light - red	69
		Miscellaneous Operating Instructions	71

DDEC Diagnostic Test Button and DDEC Override Button	71
SAHR Brake Override	71
Jump Starting the Engine	71
Towing the Vehicle	72
Transporting the Vehicle	73
Trailer loading instructions	73
General Operating Instructions	75
Loading and Unloading	75
Converter Lock-Up	75
Tires	76

Chapter 5: Preventive Maintenance

Safety Instructions	77
Perform Maintenance on Level Ground	77
Install Articulation Locking Bar	77
General Safety	77
Dump Box Safety Support	78
Maintenance Check Points	79
Lubrication instruction label	80
Fluid Checks	81
Daily/Shift requirement	81
Record Keeping	82
Independent Oil Analysis	82
Shift Maintenance Report	83
Shift Maintenance Checklist	85
Maintenance Intervals	87
As required	87
Before Each Shift	87
Every 50 Hours Of Operation	87
Every 100 Hours Of Operation	87
Hourmeter	87
Maintenance Instructions	89
Fuel System	89
Intervals	89
Fuel tank level	89
Fuel/Water separator filter	89
Drain water from fuel tank	89
Replace fuel filters	89
Bleed air from fuel system	90
Engine Oil System	90
Intervals	90
Engine oil level	90
Air Filter System	91

Intervals	91
Dry type air filter	91
Primary (outer) filter element	91
Evacuator valve	91
Pre-cleaner	91
Cooling System	92
Intervals	92
Cross flow radiator	92
Coolant system hoses	92
Hydraulic System	93
Intervals	93
Hydraulic oil level	93
Hydraulic sight gauges	93
Transmission System	94
Intervals	94
Sight gauge	94
Transmission oil level	94
Transmission breather	94
Axles	95
Intervals	95
Oil check	95
Differential and planetary breathers	95
Electrical System	96
Batteries	96
Battery isolation switch	96
Circuit breakers/Electrical component box	96
Rims and Tires	97
Servicing	97
Check tire pressure	97
Wheel lug nuts	97
Lubrication and Miscellaneous Maintenance	98
Grease points	98
Lincoln Auto Lubrication	98
Check grease tank	98
Check distribution block	98
Exhaust system	98
Catalytic exhaust converter	98
ECS purifier	98
Engine drive belts	99
Fan hub grease fitting	99
Fire extinguisher	99
Fire suppression system	99
Storage	101
Preparation for Storage	101
Removal from Storage	101
Trouble Shooting	103

Chapter 1: Introduction

General

These instructions are intended for operators.

Users of Atlas Copco equipment should first attend an Atlas Copco training course on the safe and proper use of our machinery.

Before using the machine, completely read through the operating instructions, paying particular attention to all safety instructions.

Use only Atlas Copco replacement parts when performing maintenance or repairs on your equipment.

This manual is your guide to the correct operation of Atlas Copco Minetruck models:

- MT-431B
- MT-436B
- MT-436LP

Become familiar with it, understand it and use it. Read all instructions carefully before operating the machine. These instructions will help you understand the unit, its capabilities and its limitations.

Information general to the entire product range is discussed in the first five sections. All gauges, controls, indicators and optional equipment are described, although specific items may only be encountered on one model.

Before Starting

It is your responsibility to read this manual before operating the Minetruck. Do not remove this manual from the vehicle. See your Atlas Copco sales company or authorized dealer for additional information and manuals.

General safety precautions are listed in the safety section of this manual. Specific safety precautions are put in the body of the manual where specific hazards exist. Safety signs are also put on the vehicle to warn against potential exposure to hazards that can be incurred during the reasonable use or operation of the vehicle.

All possible circumstances that may involve a potential hazard can not possibly be included in this manual. Therefore, you must make a judgement that an operation, service procedure, etc., will be safe for you and others around you. If you damage the vehicle, know that something is not adjusted correctly, or know there are missing parts, make sure that the damage, adjustment, or missing parts are repaired, adjusted, or replaced before you continue to operate.

Read the safety messages in this manual and observe and follow the safety signs provided on the vehicle. Make sure that all warning and safety signs are in place, and that they are clean and legible.

Contact your Atlas Copco sales company or authorized dealer if you have any questions.

Important Prior to unloading vehicle from transport make sure to follow the procedure outlined on the "Unloading Procedure" document included in the OVM box. Prior to placing the vehicle in service for the first time, make sure to complete all the checks on the "Certificate of Delivery."

Warnings

Description

The manuals contain warnings. The warnings contain a safety text and the danger warning is preceded by a symbol.



Danger symbol

Heading



DANGER The **Danger** heading indicates an imminent risk of serious or lethal injury if the warning is not heeded.

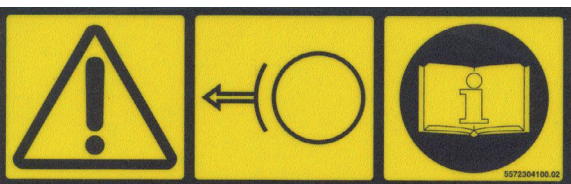
WARNING The **Warning** heading indicates a risk or dangerous course of action that can lead to serious or lethal injury if the warning is not heeded.

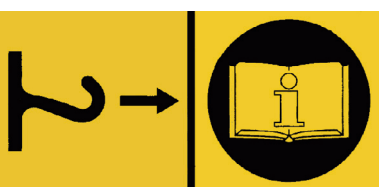
Caution The **Caution** heading indicates a risk or dangerous course of action that can lead to personal injury or damage to property if the warning is not heeded.

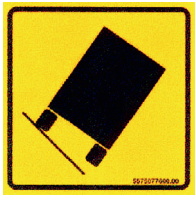
Important The **Important** heading indicates information that may prevent damage to the vehicle.

Note The **Note** heading indicates information that will save time or has been very useful in the past.

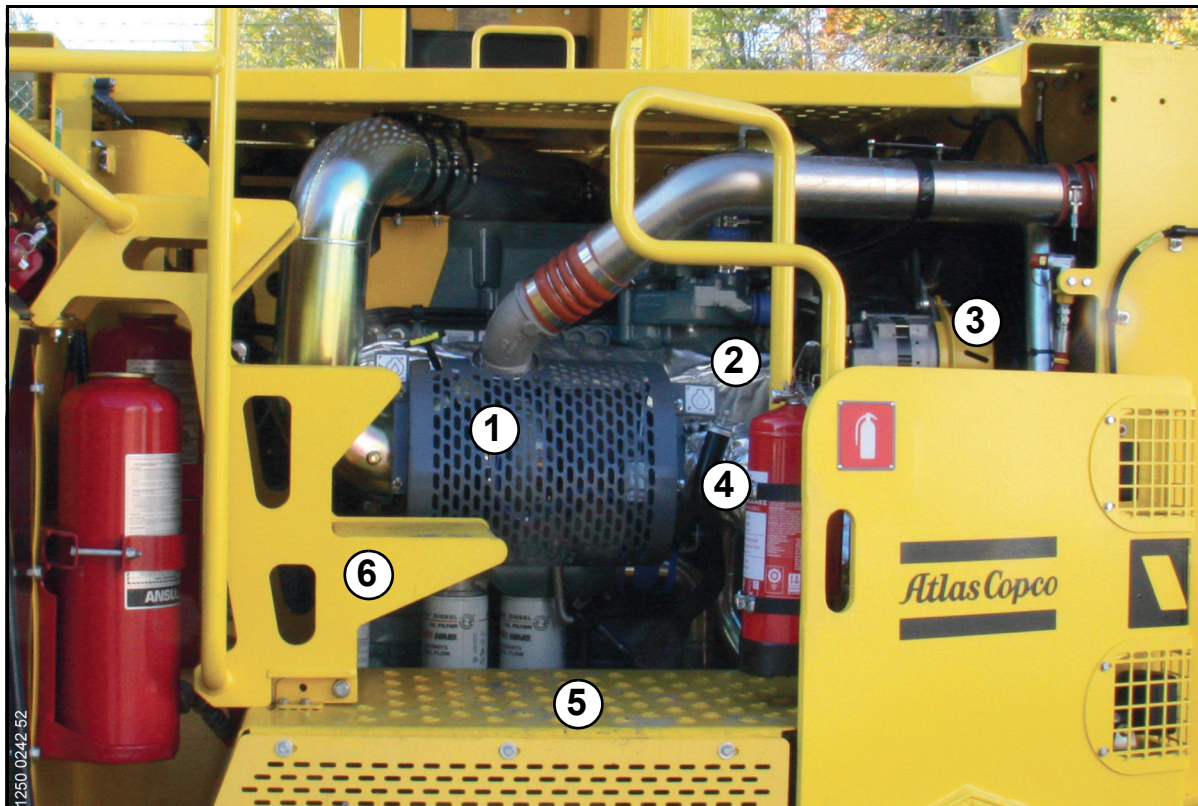
Safety Labels

	Warning! — Read the instruction manual before operating this vehicle. Incorrect handling of the vehicle can result in injury to personnel and damage to equipment. To avoid serious injury or damage, learn the meanings of the various warning signs and follow the instructions carefully. Wear appropriate personal protection equipment when operating this vehicle.
	Danger! — SAHR Brake Emergency Brake Release System Read the instructions for using the Emergency Brake Release before attempting to use the pump off system. Incorrect use of this can result in injury to personnel and damage to equipment.
	Fire Hazard. Diesel fuel is flammable. Do not have an open flame present when refueling the vehicle. Shutdown engine before refueling.
	Warning! — Fire Suppression Actuator; Read Manual On vehicles equipped with fire suppression systems, this label is located near the fire suppression actuator(s). There are usually two actuators, one in the operator's compartment and the other in or near the engine tub. In the event of fire: 1. Stop engine 2. Remove safety ring 3. Push down (in) on actuator For more information about how the fire suppression works, see the "Fire Suppression" section of your Minetruck Service Manual.
	Warning! — Falling Debris Hazard Loose material can fall from the dump box. Always wear personal safety equipment (hard hat, etc.) when working around a loaded dump box.
	Warning! — Liquid Under Pressure The hydraulic, engine oil, and engine cooling systems all contain hot liquid under pressure. Make certain to allow vehicle to cool and vent all pressure before performing maintenance. <i>See "Chapter 5: Preventive Maintenance" on page 77.</i> for instructions on how to safely vent pressure. This label is found on valves, accumulators, surge tanks, and other components where pressure may pose a hazard.

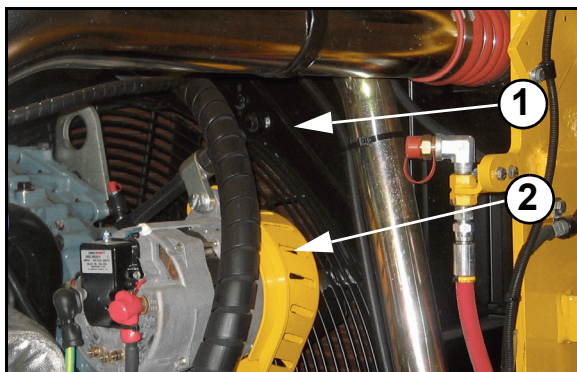
	Warning! — Slipping/Tripping Hazard Some surfaces may be slippery from hydraulic fluid, oil, or fuel. Always use caution when walking on the hoods. Handles, hinges, and latches may present a tripping hazard. Pay attention to where you are stepping.
	Caution! — Hot Surface Avoid contact with hoses, fittings, and metal surfaces when the vehicle is operating. Hydraulic oil at operating temperature may reach 210°. Wear protective clothing, gloves, etc., when you must contact potentially hot surfaces. Let the vehicle cool to ambient temperature before performing maintenance.
	Danger Zone — Crushing Hazard Never enter the articulation area unless the locking bar is in place.
	Danger! — Stored Energy Hazard This symbol is stamped in each SAHR Brake housing. Never attempt service on the SAHR brakes without first reading the applicable information in the service manual. The springs in the SAHR brake are under extreme compression and improper disassembly methods can result in serious personal injury and equipment damage.
	Warning! — Do Not Step This prohibition sign appears on surfaces where you should not step or attempt to use as a step. For example, on vehicles equipped with an air conditioner, there is a plate mounted above the compressor fan that is designed to protect the vehicle from falling debris. It is not designed to support your weight, and using the plate as a step can result in damage to the fan.
	Warning! — Read Towing Instructions Never attempt to tow this vehicle unless you have read and fully understand the instructions in "Towing the Vehicle" on page 62 of this manual.
	Warning! — High Pressure Hazard Danger of scalding pressure. Can cause serious injuries. The pressure must be released before the cap can be removed.

	Prohibition sign! No admittance. No admittance to unauthorized personnel. Violation can cause personal injury.
	Warning! — Box Crush Hazard, Read Manual
	Warning! — Rollover
	Warning! — Fire exstinguisher insert on hood.

Engine Compartment Guards



1. Turbo guard
2. Exhaust manifold blanket
3. Alternator guard
4. Exhaust pipe wrap
5. Exhaust Guard
6. Step



1. Radiator Fan Guard
2. Alternator Guard

Know Your Vehicle

The Atlas Copco Minetruck is a 4-wheel drive, rubber-tired vehicle powered by a diesel engine. The power train is through a torque converter, powershift transmission and differential type axles with planetary wheel ends. The Minetruck is designed for hauling and dumping materials.

The vehicle consists of two major sections: the power frame (bogie) and the load frame (chassis). These two sections are joined by hinge pins which allow the sections to pivot. The front section (the power frame) includes the engine, torque converter, transmission, the operator's compartment, and front drive axle. The rear section (the load frame) contains the dump box and rear drive axle.

As an operator, it is your responsibility to make certain that the Minetruck operates at maximum efficiency with the greatest possible safety. It is also your responsibility to keep it in top operating condition through proper operating techniques and correct operator maintenance. Remember, safe and efficient operation is up to you — the operator.

Model Identification

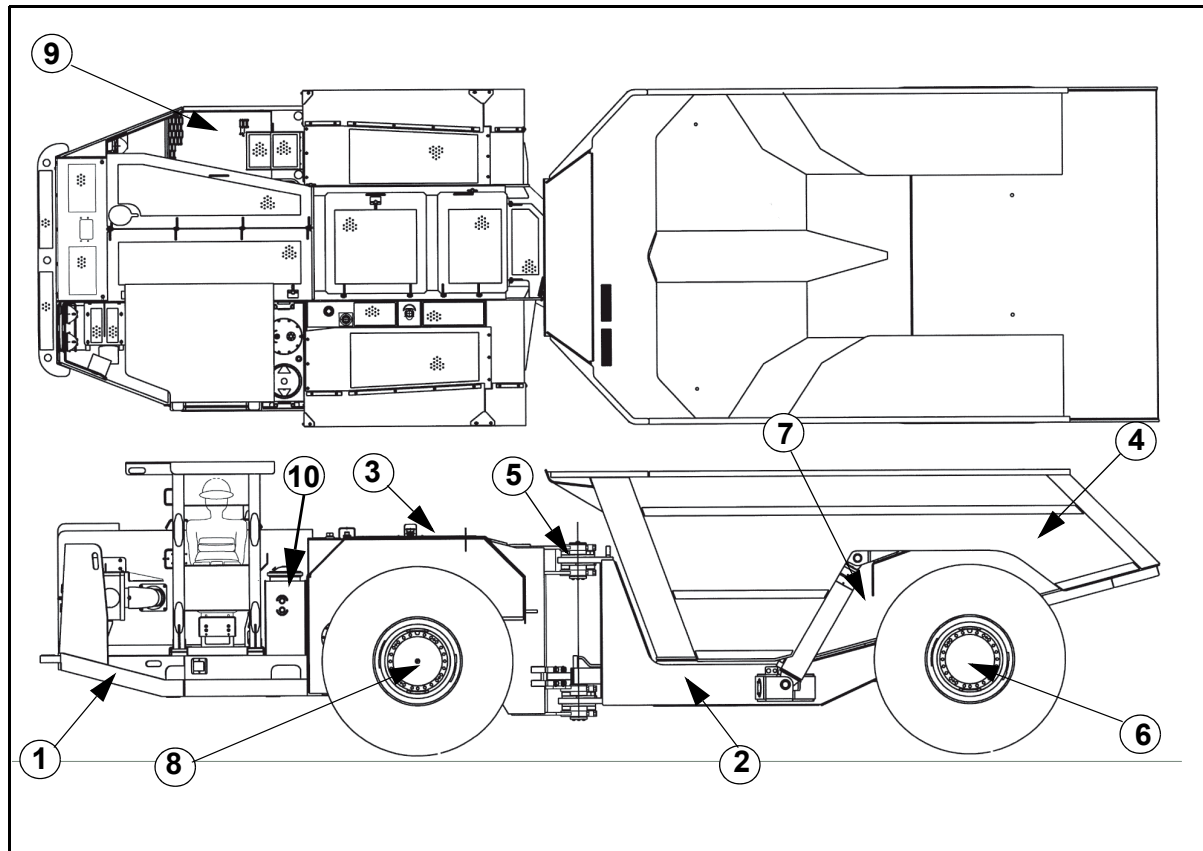
The model designation is assigned as follows.

Element	Meaning
MT	Minetruck
4	Four Wheel Drive
31, 36	Box capacity in short tons
B	Design series
LP	Design series, Low Profile
FS	Design series, Forward Seated
SS	Design Series, Side Seated
Can	Canopy, Protection Roof
Cab	Enclosed Cabin

The model identification data is stamped on the vehicle nameplate located near the operator compartment on the vertical surface of the chassis. The nameplate contains the vehicle model number and the vehicle serial number.

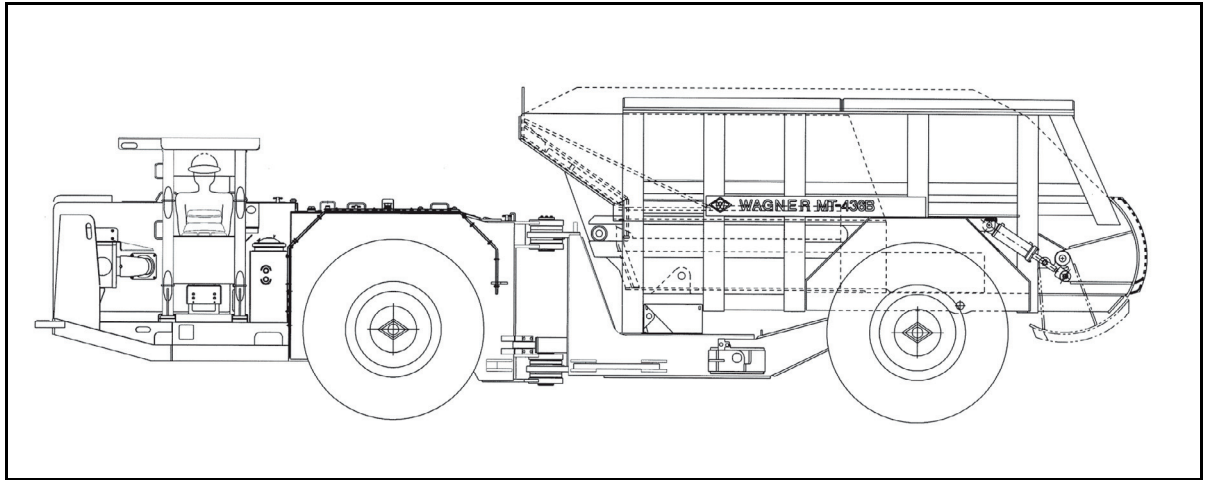
Terminology

Standard MT431B/MT436B/MT436LP



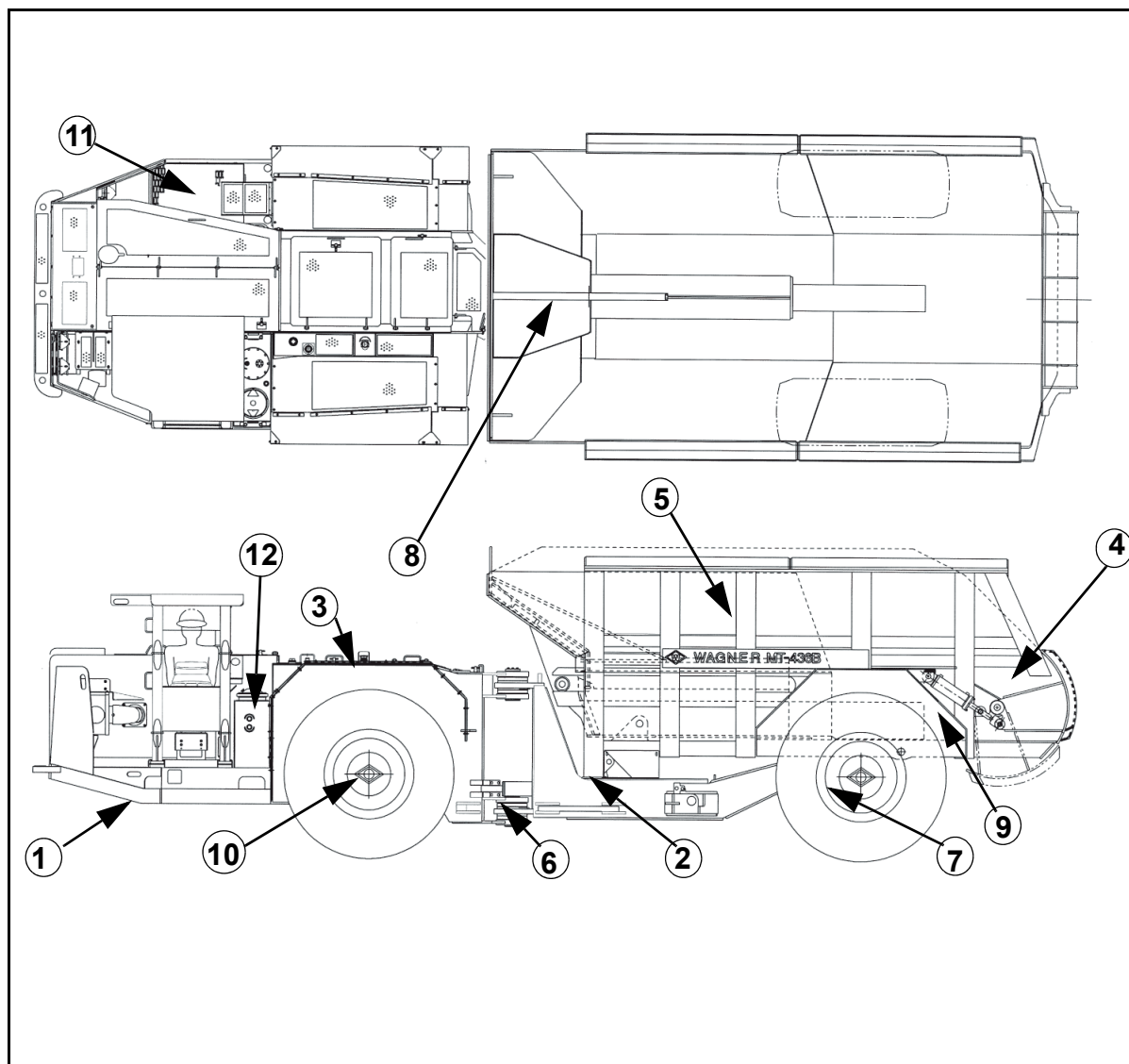
1. Power Frame
2. Load Frame
3. Fuel Tank
4. Dump Box
5. Articulation Hinge
6. Rear Axle
7. Dump Cylinders
8. Front Axle
9. Engine Tub
10. Hydraulic Tank

Left and right side



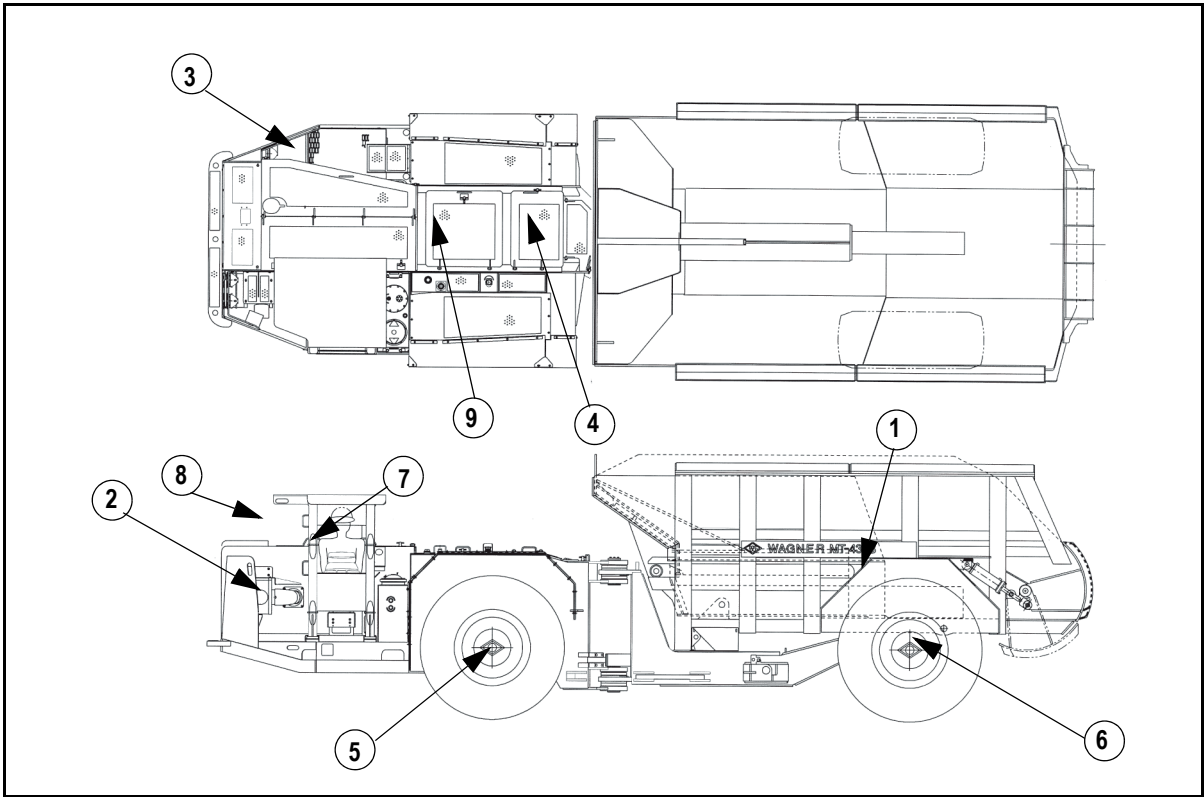
Right and left-hand, when used in this manual, are the right and left sides of the vehicle as seen from the operator's seat when looking toward the front of the vehicle. Most Atlas Copco Minetrucks offer either forward seated and side seated seating for the operator.

Teletram



1. Power Frame
2. Load Frame
3. Fuel Tank
4. Tailgate
5. Teletram Box
6. Articulation Hinge
7. Rear Axle
8. Push Plate Cylinder
9. Tailgate Cylinder
10. Front Axle
11. Engine Tub
12. Hydraulic Tank

Identification Numbers



Record the vehicle model number, Product Identification Number (P.I.N.), and component serial numbers on the lines provided below. When you need parts information or vehicle information, provide these numbers to your authorized Atlas Copco dealer.

Also record these numbers and the Manufacturer’s Statement of Origin in a safe place.

1. Vehicle model number	
2. Product serial number	
3. Engine model and serial numbers	
4. Transmission model and serial numbers	
5. Front axle model and serial number	
6. Rear axle model and serial number	
7. ROPS/FOPS certification number (where applicable)	
8. CE Marking	
9. Converter model and serial number	
Notes	

Chapter 2: Safety

General Safety Instructions

Incorrect or improper use of this vehicle can cause injury or death. Most accidents can be avoided by following basic rules and precautions.

Know the rules and laws of the area that you will be operating in. Make sure that you have the appropriate safety equipment. If you have any questions, check with the job foreman before you start.

Hard hats, protective shoes, reflector vests, heavy gloves, respirators, eye and face protectors, and ear protection are standard items required for the driver's security. Know what is required before you start the job.

Know and obey all signs, hand signals, and control signals.

Before you operate this vehicle, make sure you read and understand the operator's manual completely.

Do not operate this vehicle unless you have been trained in its safe and proper use.

Make sure that your vehicle has been maintained in accordance with the relevant maintenance schedule(s).

Always begin each shift by performing a walk around of the vehicle as outlined in Section Three of this manual.

At the beginning of each shift, check to make certain all controls, instrumentation, and emergency stop devices are functioning properly.

Make sure all access doors, panels, and covers are secure or closed correctly before you start.

Check the vehicle safety equipment such as lights, brake lights, directional lights, back-up alarm and seat belts before you start.

Keep the work area and haulage road clear of stray rocks.

Do not wear loose fitting clothing. Avoid long hair that is not covered and avoid jewelry and loose personal articles.

Know your vehicle's loaded overall height. Never drive under a structure unless your height is less than the structure height.

Never operate the vehicle when a warning system is activated, or with Warning/Do Not Operate tags attached.

Never smoke around fuel.

Always shutdown engine when refueling vehicle.

Know the location of the nearest fire extinguisher.

Exhaust fumes can cause death. Make sure you use adequate ventilation when you run the engine in an enclosed area.

Never start, stop or operate the vehicle unless seated in the operator's seat.

Do not allow unauthorized riders in or on the vehicle.

Risk Areas

Description

The risk area of the vehicle is a zone within or around the truck where a person is exposed to risk of serious injury and health hazards.

The following must apply in order for the vehicles risk area to be valid for a vehicle supplied from the factory.

- Ear protectors, goggles and helmet must be worn in the close vicinity of the vehicle while it is in operation.

Safe Zone

The operators cabin is the only safe zone on the vehicle during operation.

Risk Area

Repositioning

Note *Observe the following when moving the mining loader:*

- Make sure there is no one in the direction of travel of the vehicle.
- Make sure there is no one within the Minetrucks risk area.

Working in the Risk Area

Description

Fault finding or working in the vehicles risk area involves risk. Accordingly, always carry out the fault finding or the work with great care and accuracy.



DANGER *Never enter the articulation area of the vehicle until the articulation lock bar has been installed.*

Note *Take notice of the vehicles warning signals when you are in its vicinity*

Specific expertise

Specific expertise is required for:

- The electrical system
- Diagnosis of and work on the electrical system must only be performed by appropriately authorized electricians.
- Tires and wheels
- All work with tires and rims is to be carried out by specially trained maintenance personnel as it is important that the correct routines are followed and the correct tools are used.
- Climate unit refrigerant system
- Diagnosis of and work on the climate unit refrigerant system must only be performed of specially trained maintenance personnel.

Steps to take

All work in the vehicles risk area requires certain measures to be taken:

- The diesel engine must be switched off for fault finding and work in the vehicles risk area.
- Hydraulic and pneumatic systems must be depressurized for fault finding and work in the vehicles risk area.
- The vehicles power supply must be cut and blocked for fault finding and working in the vehicles risk area (the main switch must be switched

Starting and Driving the Vehicle

When getting into the vehicle, always face the vehicle and use the hand rails and steps. Do not rush and do not jump from the vehicle.

Make sure you keep the hand rails and steps clean. Remove all grease, oil, mud, etc.

Clean the operator's area before you start. Loose items in the operator's compartment can get into the controls and cause accidents.

If your vehicle has a cabin, make sure that the windows and windshield are clean and that the windshield wipers operate correctly.

Adjust the seat so that you can fully apply the service brakes with your back against the seat back. Fasten the seat belt securely. Make sure the seat belt is adjusted correctly.

Make sure all controls are in NEUTRAL and that the parking brake is ENGAGED before you start the engine.

Make sure all persons are away from the vehicle before you start the engine.

Sound the horn and warn all persons that you are going to start the engine. After the engine has started, check all instruments for correct operation.

Always check that there are no personnel in your path before setting the vehicle in motion.

Carry the box on the frame when travelling for the best visibility and vehicle stability.

On hilly terrain, your visibility may be impaired when cresting a rise or negotiating sharp corners. Always slow to a safe speed and sound your horn to warn others of your approach.

Know the area of operation and identify possible hazards that should be corrected or avoided prior to entering the area.

Do not drive close to ditches, holes, etc. Walk around the new job site and look for hazards. Know the haul road that you will be using. Make sure that all ramps and bridges will support your loaded vehicle.

Check out the dump area. Make sure all vehicle containment safety items are in place. If you have a person that is directing you, follow his instructions.

Check the instruments often as you operate. Stop operating the vehicle if a problem occurs. Have the problem resolved before you operate the vehicle again.

Do not operate the vehicle if you do not feel well. Your judgment may be reduced and can cause an accident.

You must make a judgment if weather, road, or earth conditions permit safe operation on hills, ramps or rough ground.

Drive the vehicle smoothly. Do not make sudden starts or stops.

Always give a loaded truck the right-of-way.

The safe zone on your vehicle during operation is the operator's compartment. The danger zones during operation include all areas on or around the vehicle, except the operator's compartment. Make sure that no personnel are in the danger zones during operation.

Never allow riders.

Do not leave the vehicle unattended with the engine running. Always apply the parking brake and block the wheels before leaving the vehicle.

Watch out for other people. They may not be watching out for you.

Parking and Stopping

Parking the Vehicle and Stopping the Engine

When you stop and park the vehicle, make sure the area is safe and level.

STEP 1 Make sure the box is completely down (or the teletram is fully retracted).

STEP 2 Engage the parking brake, stop the engine, put all controls in neutral, and remove the key, if one is available.

STEP 3 Release the seat belt.

STEP 4 Exit the vehicle.

Important *If you must park the vehicle on a grade, always turn the front of the vehicle toward the side wall, rib or curb. Make sure the vehicle is parked behind an object that will not move. Engage the parking brake and put blocks on the downhill side of each tire.*

Safety Equipment

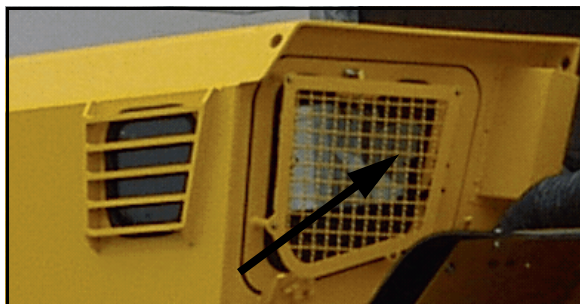
Emergency Exit

Cabin

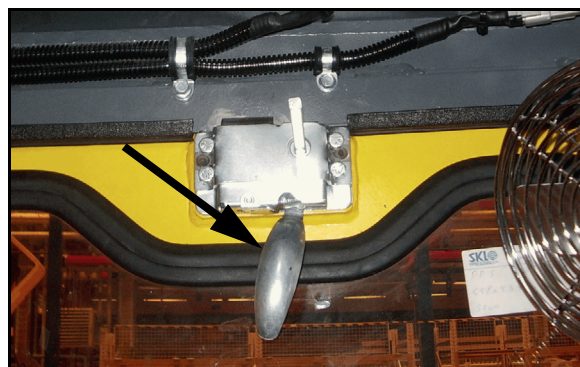


Pull the ring to remove the emergency cable, then push glass out of the window frame. In the event of an emergency, the driver can exit through the windshield or through the side windows.

Side seated cabin



Open right hand side window with latch.



Vehicle Safety Guards

After maintenance, check that all safety guards have been re-installed over all exposed rotating parts before returning the vehicle to service.



Wheel Chocks

WARNING Individual end user testing required to ensure proper chock selection and application.

- Improper use may result in product failure.
- Select wheel chock according to vehicle type and size.
- Always use in pairs and on firm surfaces
- Multiple pairs may be required in extreme conditions.
- Chock in direction of grade.
- Chock both sides of wheel if direction of grade is undetermined.
- Use only after parking brake is applied and tested.
- Center chocks snugly and squarely against tread of each wheel.
- Always test chocks to insure they meet requirements.
- Do not drive over wheel chocks.

User safety guidelines

Wheel chocks are effective holding devices, but only when used properly.

It is the decision of each individual end user to make the final determination about chocking.

Various combinations of chocking procedures should be evaluated and tested under various situations and conditions.

Wheel chocks should be used not only when a vehicle becomes disabled on a grade, but also during maintenance and any time the vehicle is left unattended.

Chocks should be used only after the parking brake is applied and tested.

A variety of chocks should be tested to determine the best chock for your particular application.

Use of Wheel Chocks

Positioning

Important Improper positioning decreases the wheel chock's effectiveness.

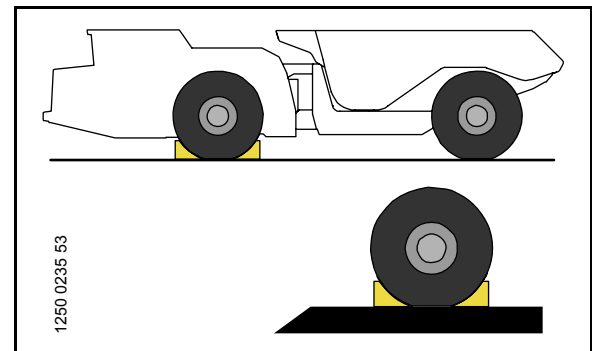
Chocks must be used in pairs and positioned downhill and below the vehicles center of gravity.

This could mean:

- chocking in front of the front wheels if the vehicle is disabled while travelling down a grade.
- chocking the back of the rear wheels if the vehicle is disabled while travelling up a grade.
- chocking the front and back of one wheel if the direction of the grade cannot be determined
- using 2 pairs of chocks in severe conditions.

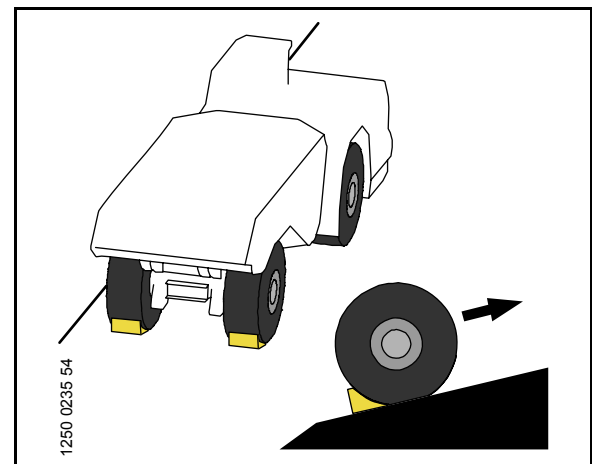
Chocks must also be positioned snugly and squarely against the center of the tire tread.

Level grade

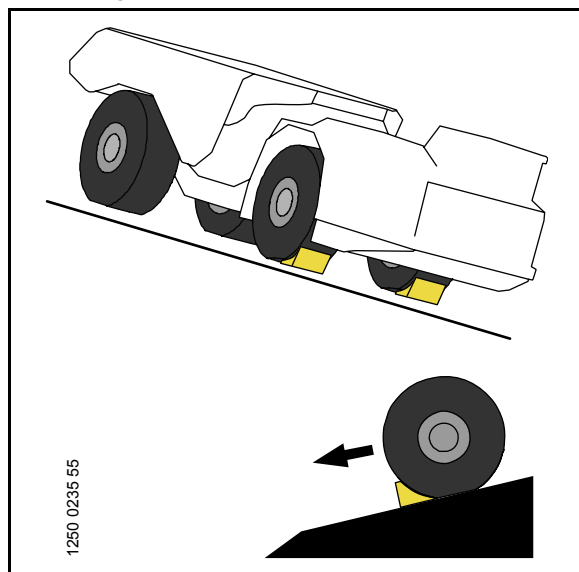


Chock both sides of wheel

Uphill grade



Chock rear wheels on each side

Downhill grade

1250 0235 55

*Chock front wheels on each side***Considerations**

There are many considerations that must be taken into account before implementing chocking procedures.

If wheel chocks are expected to hold on a specific grade, then all of the variables that may affect the chock's performance must be taken into account:

- Tyre size
- Tyre type (pneumatic, radial, bias-ply, solid rubber, etc.)
- Gross vehicle weight
- Varying tyre pressures that naturally occur with changes in the environment
- Type and condition of road surface (i.e. asphalt, gravel, dirt, firm, soft, wet, dry, icy, etc.)

Do not simply test a pair of chocks with a specific vehicle and payload, and broadly assume that the chocks will hold the same vehicle on the same grade every time.

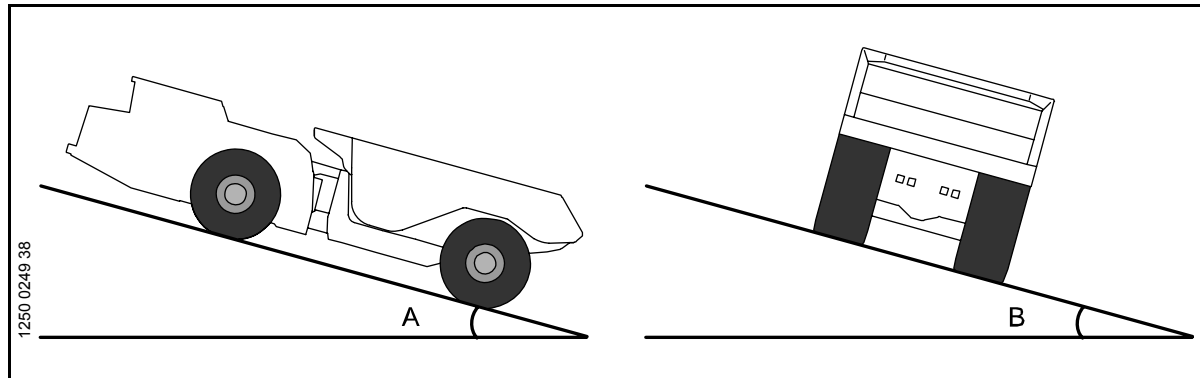
Countless combinations of conditions exist and this must be considered when selecting the most appropriate wheel chock for each application.

Complete and thorough testing must be completed to ensure that specific wheel chocks will meet the specific chocking requirements.

Stability

Static Angles of Inclination

Minetruck



Test conditions		Fully loaded vehicle, bucket down, vehicle straight/not articulated
A	Max. longitudinal inclination	10°
B	Max. lateral inclination	14°
WARNING The angles may not be combined! Important The angles do not take into account the machine's fluid levels and brake capacity!		

Driving On Slopes

General

The vehicle is dependent on many criteria to enable it to be driven safely:

- Operator's attention
- Vehicle Model
- Configuration
- Speed
- Ground conditions and terrain
- Direction of travel
- Maintenance of the vehicle
- Fluid levels
- Tyres and tyre pressure
- Load

The Operator

Note The operator has a major influence on vehicle stability.

A well-trained operator should follow the instructions in the safety, operator's and maintenance manual.

An operator should:

- make a note of the surroundings and work conditions
- have a feeling for the vehicle
- be aware of potential risks
- make the right decisions while driving

Speed

- Higher speeds make the vehicle more unstable.

Ground conditions and terrain

- The vehicle may be more unstable on uneven surfaces.
- Ground that has recently been filled with earth may sink under the vehicle.
- Stones and wet surfaces can dramatically worsen the machine's grip and stability. Stones can make the vehicle slide.

Direction of travel

- Avoid driving the vehicle across slopes. If possible, drive the vehicle straight up or straight down slopes.
- If possible, make sure that the heaviest part of the vehicle is at the top when the vehicle is driven on slopes.

Vehicle equipment

- The balance of the vehicle may be affected by the following: the components, weights and counter-weights fitted.
- Narrow tyres sink more easily in the ground and make the vehicle more unstable.

Load

The load has a major influence on vehicle stability.

- A heavy load may cause the tyres to sink further into the ground and cause the vehicle's angle of inclination to increase.
- Larger and in particular higher load volumes reduce vehicle stability.
- Low loaded vehicles are more stable.

Noise and Vibration

Declared Values

Hand arm vibration is less than 2.5 m/s² during the intended use.

These declared values were obtained by testing in accordance with the stated standards and are suitable for comparison with the declared values of other machines tested in accordance with the same standards. These declared values are not adequate for use in risk assessments and values measured in individual work places may be higher. The actual exposure values and risk of harm experienced by an individual user are unique and depend upon the way the user works, reflections from walls, road conditions, as well upon the exposure time and the physical condition of the user.

Atlas Copco cannot be held liable for the consequences of using the declared values, instead of values reflecting the actual exposure, in an individual risk assessment in a work place situation over which we have no control.

This machine may cause reduced health due to whole body vibration and noise if its use is not adequately managed. An EU guide to managing vibration and noise can be found at ISO/TR 25398 or EN 458.

Atlas Copco recommend a programme of health surveillance to detect early symptoms which may relate to vibration and noise exposure, so that management procedures can be modified to help prevent future impairment.

Noise

Declaration Noise MT436B

Machine model number, operating conditions and other information enabling identification: Minetruck MT436B, Empty dump box, free field, high idle			
DECLARED NOISE EMISSION VALUES (single-number declaration)			
	Total machine		
A-weighted sound power , LWAd (reference 1 pW) in decibels.	123		
	Cabin	Canopy	Average 1m distance
A-weighted emission sound pressure level , LpAd (reference 20 µPa), in decibels.	85	104	101
Values were determined in accordance with the noise test code provided in ISO 6394 and ISO 6393 based on basic standards ISO 3744 and ISO 11201 and ISO 11203 (remote at 1m distance free field). Note <i>Declared noise emission values are the sum of measured values and of the uncertainty. They represent an upper limit of the range, in which measured values are likely to be included.</i>			

Declaration Noise MT436B LP

Machine model number, operating conditions and other information enabling identification: Minetruck MT436LP, Empty dump box, free field, high idle			
DECLARED NOISE EMISSION VALUES (single-number declaration)			
	Total machine		
A-weighted sound power , LWAd (reference 1 pW) in decibels.	123		
	Cabin	Canopy	Average 1m distance
A-weighted emission sound pressure level , LpAd (reference 20 µPa), in decibels.	85	101	101
Values were determined in accordance with the noise test code provided in ISO 6394 and ISO 6393 based on basic standards ISO 3744 and ISO 11201 and ISO 11203 (remote at 1m distance free field). Note <i>Declared noise emission values are the sum of measured values and of the uncertainty. They represent an upper limit of the range, in which measured values are likely to be included.</i>			

Risk Assessment

Information of operation conditions and increase risk.

Factors that could reduce the risk from the noise levels:

- Use a machine with cabin
- Maintenance of door and cabin seal, isolators, mufflers
- Working with the cabin door and windows closed
- Select correct ear protectors or plugs see EN 458
- Educate personnel in how to use ear protection
- Maintenance ear protectors regularly (half year replacement of seals)
- Goggles and spectacles will reduce effect of the ear protectors use helmet goggles or ear plugs instead.
- Use the correct insertion methods for soft plugs and fitted plugs (wrong size or insertion method could reduce the effect of the plugs). See also tips below how to insert soft plugs.
- Take into account the higher noise level due to reflections from walls/roof in mine. This can be from 1 to 12 dB higher levels depending on:
 - Cabin or Canopy
 - The size (height and width) of the heading
 - The characteristics of the noise source
 - Acoustical absorption factor of the rock in the mine
 - low frequency noise levels on canopy machines
- Working hours
- Breaks and quiet areas

Noise can result in:

- permanent hearing loss;
- tinnitus;
- tiredness, stress;
- other effects such as loss of balance, loss of awareness;
- impairment of speech communication or of the perception of acoustic signals

Combinations

Note on the combination of noise and other factors:

- Vibration and noise in combination can cause higher health risks

Vibration

Declaration Vibration

Whole Body Vibration levels
For this type of machines, differences between the vibration emissions for different operating conditions are much greater than the differences between models of machine (when machines of similar size, power and purpose are compared). A vibration emission value, measured in a single standardized operating condition, is therefore unlikely to help the user to choose between competing machines or to assess and manage the risk. The typical rang of vibration levels are in real operation is in the range of 0.5 to 2 m/s2 for these type of machines.

Risk assessment

Several factors influence the whole body vibrations like speed, work cycle, ground condition and etc. The majority of the vibration risk can be reduced by the user. Selecting machines the options like ride control (Scooptram), Suspension (Minetruck) and use of correct seat according to EN ISO 7096 Class EM 3 (Scooptram) and Class EM 1 (Minetruck) will give better possibilities for lower vibration levels. But still the largest influence can be made by operator, because the operator has control over speed, working cycle, travel path, etc.

For more information how to estimate the vibration levels at your site see ISO/TR 25398.

Guideline for reducing vibration levels:

- Use the proper type, size of machine with optional equipment and attachment/tools for the task.
- Keep the ground in good condition
 - Remove larger stones and obstacles
 - Fill holes and ditches
 - Provide machines and schedules time in order to maintaining the condition of the terrain.
- Adjust the speed, operations and chose a suitable travel path to minimize the vibration level.
 - Reduce speed in rough terrain
 - Drive around obstacles and uneven ground
 - If work is performed in rough terrain an option could be to use machines with remote control
- Perform these operations smoothly:
 - Steer
 - Break
 - Accelerate
 - Shift gears

- Scoop/bucket
- Make sure that the seat is maintained and correctly adjusted
 - Adjust the set and its suspension for the operator weight and height
 - Do not over load seat according to specification
 - Inspect and maintain suspension and adjustment mechanism
 - Use the seat belt
- Minimize vibrations for long work cycles or a long travel distance.
 - Use machines with suspension for minetrucks
 - Use the option ride control on Scooptram
 - If no suspension or ride control is available reduce speed to avoid bouncing
 - Transport machines between work sites if possible
- Other risk factors may also cause back pain. They can be reduced by:
 - Adjust seat and controls to achieve good posture
 - Adjust mirrors to minimize twisted posture
 - Provide breaks to reduce long periods of sitting
 - Avoid jumping from down from the machine
 - Minimize repeated handling and lifting of heavy objects

Chapter 3: Controls & Indicators

Introduction

Atlas Copco provides a wide variety of instrumentation packages to meet the specific needs of our customers. Accordingly, instrumentation can vary within a model, as well as between models. Refer to the accompanying illustrations to help identify the instrumentation layout applicable to your vehicle.

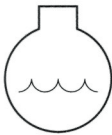
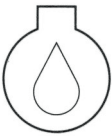
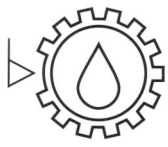
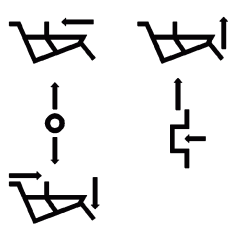
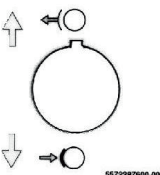
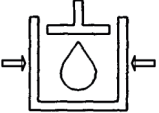
Become completely familiar with all controls and indicators before operating the Minetruck. Read the following descriptions carefully. They will help you to know your vehicle for maximum safety and efficiency during operation.

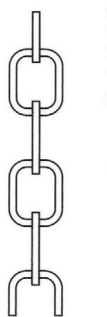
Check the controls and indicators frequently during operation to make sure that all systems are functioning properly. Report all malfunctions and illegible indicators.

This section is set up as follows:

- Gauges
- Indicators and Warning Lights
- Switches and Buttons
- Hand and Foot Controls
- Miscellaneous Controls

Symbols

Symbol	Description	Symbol	Description
	Engine Coolant Temperature		Transmission Oil
	Engine oil		Diesel fuel
	Engine oil filter		Hydraulic oil
	Fuel filter		Steering System Failure/ Malfunction
	Transmission oil filter		Monostick steering control
	Transmission oil level		Teletram control
	Parking brake release		Hydraulic oil pressure



Sling/tow point



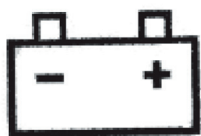
Hydraulic Oil High Temperature



Brake test switch



Retarder (engine)



Battery charge



Volume full



Hydraulic oil level low



Check engine



Horn



Stop engine



Converter lock-up release



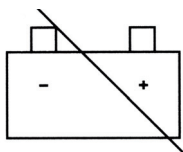
Dome light



Front lights



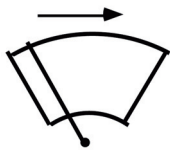
Rear lights



Battery disconnect



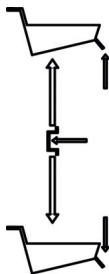
Front wiper (FS Cab)



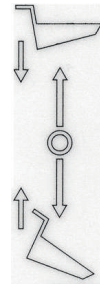
Front wiper (SS Cab)



Windshield washer



Tailgate control



Dump control



On/Off/Start switch



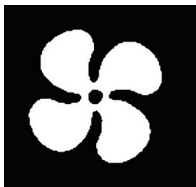
Rear wiper



Converter lock-up



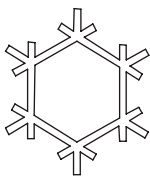
Defroster



Fan Hi-Lo



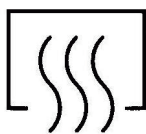
Engine



Air conditioner on/off



DDEC Override



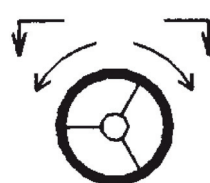
Climate control



Fire extinguisher



Transmission warning



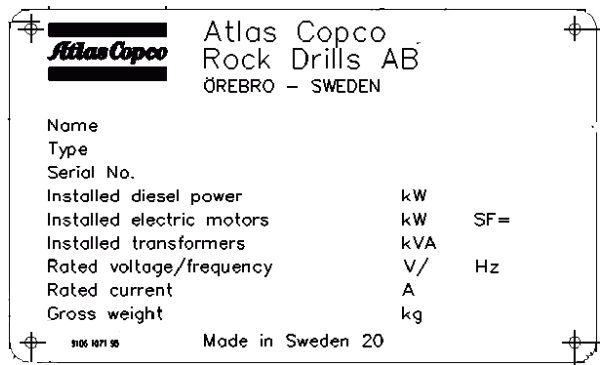
Wheel steering control



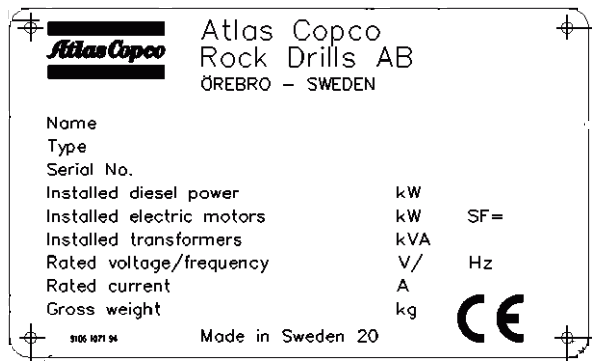
Dump control box float

Identification

Vehicle Nameplate



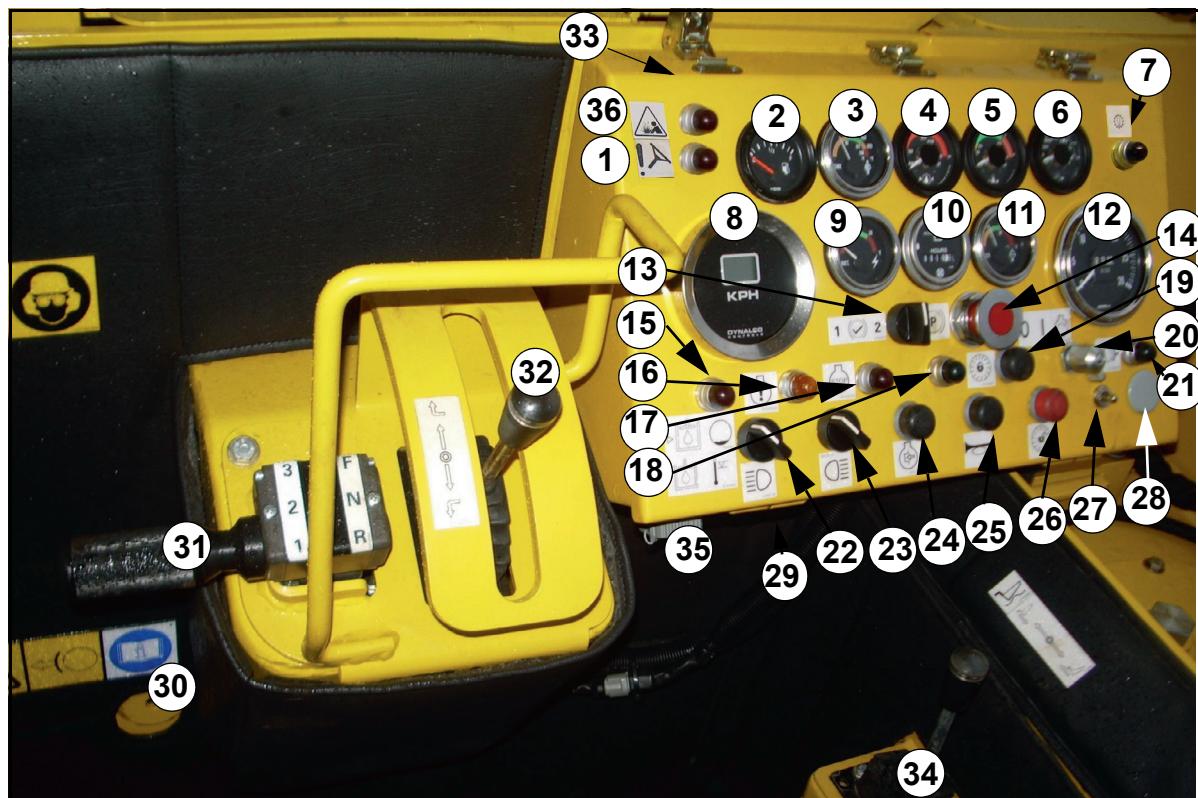
Nameplate



CE Regulations nameplate

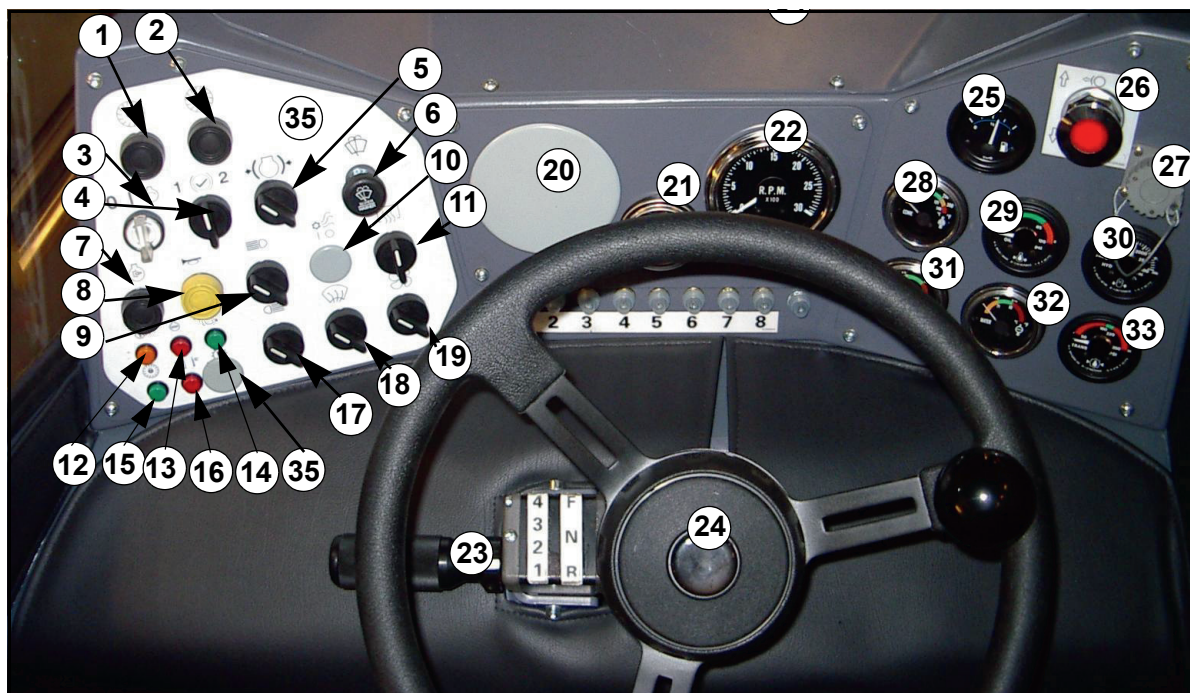
Instrument Panels

SS Canopy/Cabin (MT431 and MT436B)



- | | |
|---|---|
| 1. Emergency Steering Light (optional) | 19. Converter Lockup Button |
| 2. Fuel gauge | 20. ON/OFF Start |
| 3. Converter Temp | 21. Retarder Warning Light (Engine) |
| 4. Converter Pressure | 22. Front Light Switch |
| 5. Oil Pressure | 23. Rear Light Switch |
| 6. Accumulator Pressure | 24. DDEC Override |
| 7. APC100 Warning Light (optional) | 25. Horn |
| 8. Speedometer (optional) | 26. Converter Lockup Release Button |
| 9. Volt Meter | 27. Retarder Switch |
| 10. Hour Meter | 28. (optional) |
| 11. Engine Coolant Temperature | 29. Emergency Steering Warning Buzzer (optional) |
| 12. Tachometer | 30. Sahr Brake Override |
| 13. Parking Brake Test Switch | 31. Electric Shift Control |
| 14. Parking Brake Switch | 32. Monostick Steering Control |
| 15. Hydraulic Warning Light (Oil Level low /Temperature High) | 33. Instrument Panel |
| 16. Check Engine Light | 34. Dump Control |
| 17. Stop Engine Light | 35. DDEC Reader Port |
| 18. Converter Lockup Light | 36. Emergency Steering Remaining System Pressure Warning (optional) |

FS Cabin (MT 431 and MT436B)

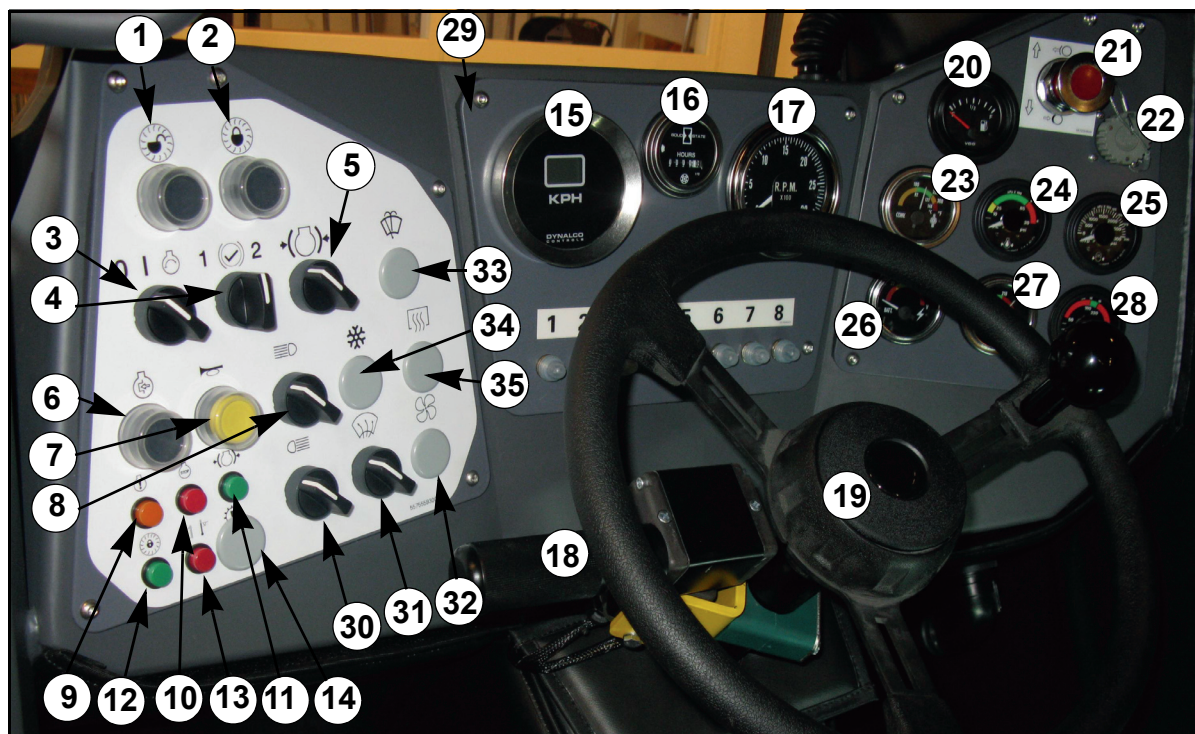


- | | |
|---|---------------------------------------|
| 1. Converter Lockup Release | 18. Defroster |
| 2. Converter Lockup | 19. Pressurizer Switch |
| 3. Ignition | 20. Speedometer (optional) |
| 4. Parking Brake Test Switch | 21. Hour Meter |
| 5. Retarder /Engine) | 22. Tachometer |
| 6. Wiper/Washer | 23. Electric Shift Control |
| 7. DDEC Override | 24. Orbitrol (wheel) Steering Control |
| 8. Horn | 25. Fuel Gauge |
| 9. Front Light Switch | 26. Parking Brake Switch |
| 10. AC | 27. DDEC Reader port |
| 11. Heater Switch | 28. Converter Temp |
| 12. Check Engine | 29. Oil Pressure |
| 13. Stop Engine | 30. Accumulator Pressure |
| 14. Retarder Warning Light (Engine) | 31. Volt Meter |
| 15. Converter Lockup | 32. Engine Coolant Temperature |
| 16. Hydraulic Warning Light (Oil Level low /Temperature High) | 33. Transmission Pressure |
| 17. Rear Light Switch | 34. Instrument Panel |
| | 35. APC100 Warning Light (optional) |



- | |
|---|
| 36. Emergency Steering Light (optional) |
| 37. Emergency Steering Remaining System Pressure Warning (optional) |

FS Canopy LP (MT436B)



- | | |
|---|---------------------------------------|
| 1. Converter Lockup Release | 18. Electric Shift Control |
| 2. Converter Lockup | 19. Orbitrol (wheel) Steering Control |
| 3. Ignition | 20. Fuel Gauge |
| 4. Parking Brake Test Switch | 21. Parking Brake Switch |
| 5. Retarder (Engine) | 22. DDEC Reader port |
| 6. DDEC Override | 23. Converter Temp |
| 7. Horn | 24. Oil Pressure |
| 8. Front Light Switch | 25. Accumulator Pressure |
| 9. Check Engine | 26. Volt Meter |
| 10. Stop Engine | 27. Engine Coolant Temperature |
| 11. Retarder Warning Light (Engine) | 28. Transmission Pressure |
| 12. Converter Lockup | 29. Instrument Panel |
| 13. Hydraulic Warning Light (Oil Level low /Temperature High) | 30. Rear Light Switch |
| 14. APC100 Warning Light (optional) | 31. Defroster (optional) |
| 15. Speedometer | 32. Pressurizer (optional) |
| 16. Hour Meter | 33. Wiper Washer (optional) |
| 17. Tachometer | 34. Air Conditioner (optional) |
| | 35. Heater (optional) |



36. Emergency Steering Light (optional)
 37. Emergency Steering Remaining System Pressure Warning (optional)

Gauges

General

Some model Atlas Copco vehicles are usually equipped with color-coded gauges. Temperature or pressure is normal when the gauge needle is in the green zone. If the gauge needle moves into the red zone, stop the vehicle in a safe location and report any malfunction to maintenance personnel.

Accumulator pressure



This gauge indicates hydraulic pressure in the brake accumulator circuit. The accumulators are normally charged to approximately 83 bar. The Accumulator Pressure Gauge will normally read between 110-138 bar during the normal operation.

Note While gauges on older Atlas Copco models were mechanically activated, gauges on the newer vehicles are electrically activated when the ON/OFF start switch is turned to the ON position. Do not assume that accumulator pressure is at zero until the ON/OFF start switch is in the ON position and fully vented all accumulator pressure.

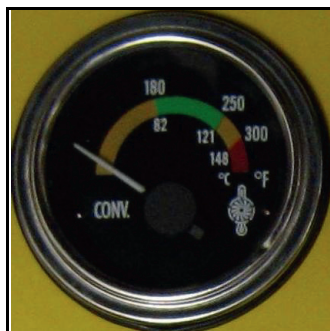
Transmission pressure



Indicates transmission clutch or converter oil pressure. Normal pressure is 12,4-15,2 bar and is indicated by the green area on gauge.

Important Stop the engine and consult maintenance personnel if needle is in the red area when operating.

Converter oil temperature



Indicates converter oil temperature. Normal temperature is approximately 93 °C (200 °F). If the temperature rises above the safe level, stop the Minetruck and allow it to run in neutral until the temperature drops to normal. Report excessive temperature conditions to maintenance personnel.

Important Important: Do not exceed 121 °C (250 °F) for extended periods.

Engine coolant temperature



On vehicles equipped with water-cooled engines, normal temperature is 160-185 °F (71-85 °C). Maximum allowable temperature is 212 °F (100 °C). If the gauge indicates above maximum temperature, stop operation and allow the engine to idle. When the temperature lowers, stop the engine and report the malfunction to the maintenance personnel.

Important Do not operate the engine if maximum temperatures are exceeded.

Engine oil pressure



During normal driving, the engine oil pressure should read between 1.7-6 bar. At idle speed, the pressure may be lower. If the engine oil pressure decreases and enters the yellow zone of the gauge (below 1.7 bar) during normal driving, stop the vehicle and stop the engine. Contact maintenance personnel to correct the problem before resuming operation of the vehicle.

Voltmeter



The voltmeter indicates the output of the alternator. Normal operation is in the GREEN zone, but may register in the YELLOW zone at engine idle.

Important If the gauge indicates in either the lower or upper RED zone, stop operation immediately and report the malfunction.

Hourmeter



This meter is activated by the engine oil pressure. It registers the total elapsed time of engine operation. Use the engine hourmeter to service your vehicle according to the service intervals. Report any malfunctions to the maintenance personnel.

Tachometer



This gauge shows the engine speed in revolutions per minute (RPM).

Important Do not operate the engine at speeds faster than 2300 rpm. Damage to the engine can result. 2300 rpm is marked with a red line on the gauge.

Indicators and Warning Lights

Check engine light



On DDEC engines a YELLOW warning indicator illuminates when the engine senses an operating problem which is not critical. You should contact maintenance personnel as soon as possible. Check the engine at the end of your shift or at the end of the day.

Stop engine warning light



This RED lamp indicates when an unsafe condition is sensed on the DDEC engine. When it illuminates, the engine will automatically start to reduce power. Stop the engine and contact maintenance personnel to correct the problem before starting the engine again.

Note Operator will have 30 seconds at the pre-rampdown power level before engine drops to low power.

Note See “Override button” on page 44.

Converter APC lock-up indicator

This lamp illuminates when the Automatic Powershift Controller sends a signal to activate the converter lockup solenoid.

In converters equipped with lock-up, a hydraulic clutch similar to the transmission clutches is used to “lock” the engine mechanically to the output of the converter. Hydraulic pressure actuates the lock-up, which locks the impeller cover to the turbine hub. The converter then turns at a 1:1 speed ratio and provides direct drive.

The result is less heat generation in the transmitter/converter circuit and, in some cases, actual cooling of the circuit. The torque multiplying feature of the converter is lost, however.

Converter lock-up light

This GREEN lamp shows when the transmission is in lock-up. The light should illuminate when the converter lock-up button is pressed. The light will go off when the lock-up release button is actuated or engine rpm falls below 1200.

Engine retarder/jake brake light

This GREEN light illuminates when either the transmission retarder or engine Jake brake system is activated.

Auto transmission warning light



This warning lamp can indicate detection of four different conditions:

- inhibition by a shift protection feature
- driveline overspeed
- low clutch pressure
- output speed sensor failure

In the first two cases, the light will illuminate steadily. If you are attempting to change direction or gear and this light comes on, you are attempting an action not allowed for conditions.

If the light comes on when you are not attempting to change direction or gear, your driveline is overspeeding. You should apply the brake to slow the vehicle.

If the light is blinking slowly, it indicates that clutch pressure is low. A fast blink indicates output speed sensor failure. Contact maintenance immediately when either of these occur.

Note Refer to the APC 100 Systems and Service Manual for further information on correct system operation.

Switches and Buttons

Brake override knob

SAHR brake systems are spring applied and hydraulically released. Without hydraulic pressure all four wheel end brake assemblies are applied. To release the brakes without pressure supplied by the hydraulic pumps (i.e., when the engine isn't running), the vehicle is equipped with a manual brake pump-off system consisting of a hand pump and this brake release (Override) knob. [See "SAHR Brake override system" on page 55.](#) for the safe operation of this system.

Note *The location of the override may vary, but it will always be clearly labelled and within easy reach of the operator when safely seated.*

This control must be constantly activated during towing procedures to assure enough pressure to release the wheel-end brakes. As soon as this control is released, all pressure in the brake system is dumped to tank, and the springs immediately reapply the brakes. While the control is held in place, the brakes can also be applied by normal use of the brake pedal.

Circuit breakers

There are usually two groups of circuit breakers, located in the instrument panel, and a main circuit breaker box in the engine compartment. Additional circuit breakers may be in the electrical circuit if optional equipment requires.

Refer to the circuit breaker installation illustrations in the Parts Book for the placement of circuit breakers on your vehicle.

Horn button



The horn is electrically operated by pressing this button. It is good practice to sound the horn before starting or placing the vehicle in motion.

ON/OFF/START switch



When set to ON, this switch supplies power to the instrument panel. Use this switch to start and stop the engine. To engage the starter, turn the switch all the way to the right. Release when the engine starts, and the switch will spring return to the ON position. To stop the engine, turn the switch left, to the OFF position.

Note *On some vehicles, this is a keyed switch*

Converter lock-up button



Pressing this button activates converter lock-up as long as engine speed is above 1200 rpm. The green lock-up light will illuminate.

Converter lock-up release



Press this button to disengage converter lock-up.

Note *Vehicles equipped with the APC100 automatic transmission control will not have converter lock-up and lock-up release buttons.*

Retarder engine



This switch will manually activate the Jake brake on large trucks equipped with an engine exhaust braking system. The system is also equipped with a speed sensing switch that will automatically activate the Jake brake upon high engine RPM.

Light switches

Vehicles with rocker switches

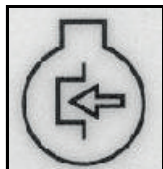
Push the top of the switch to the first detent position to illuminate the parking lights. Push the switch to the second detent position to illuminate the driving lights. Push the bottom of the switch for the OFF position.

Vehicles with rotating or toggle switches

Set either switch to ON as required for front and/or rear headlights.

Override button

Detroit diesel engine



The DDEC engine is a computer controlled engine with many safety features built in. When certain unsafe conditions (i.e. low oil level) are sensed while the engine is running, it will automatically rampdown to a lower power within 30 seconds, from whatever power level the engine was at when the condition was sensed. The override button is provided to allow the operator the opportunity to get the vehicle to a safe location and call maintenance personnel. Pressing it will return engine power to the level it was at prior to rampdown. This provides the operator another 30 to 40 seconds of continued operation, until the engine starts dropping back to low power again. The button does not need to be held down. Hitting the button again provides another 30-40 seconds. Activation of the Override button is recorded by the DDEC monitoring system.

Important Do not continue to operate the vehicle any longer than necessary to get it to a safe location.

Important Damage to the engine may occur if the engine rampdown is overridden. The Engine Rampdown Override is only for an emergency or hazardous situation.

During engine startup, this button may be used to provide engine error codes, should the RED Stop Engine warning light remain on. Depressing the Override button will flash the appropriate error code with the On/Start switch in the ON position.

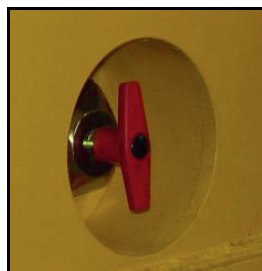
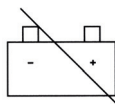
Override procedure

When a potentially damaging condition arises with either the engine or the transmission, the on-board computers provide a means to protect their respective systems from extensive damage. The engine Electronic Control Module (ECM) will ramp down power when it detects a severe problem. The transmission Electronic Control Unit (ECU) will disable the transmission's upper gears and will default to neutral if the ECU detects a problem.

The following are conditions that will cause the computers to begin their safeguarding procedures:

- Low Engine Oil Pressure (Below 1.3 bar)
- Engine Temperature Too High (Above 99 °C)
- Low Coolant Level
- Low Coolant Pressure

Battery isolation switch



This switch isolates the battery from the electrical circuits and should be set to OFF when the vehicle is not in use or during maintenance and repair to help prevent electrical shorts.

Important To prevent damage to the DDEC electronic control system, disconnect the battery isolation switch and pull the main electrical circuit fuses before welding. Failure to isolate the DDEC system from high current flow can result in severe ECM damage

Parking brake button



To park the vehicle or make an emergency stop, push down on this button. On vehicles with the Atlas Copco SAHR brake system all four wheel-end brake assemblies will be applied. The parking brake cannot be released until the engine is started and hydraulic pressure is available.

The Minetrucks are equipped with an automatic brake latching safety circuit. The indicator light will blink when the parking brake has been set by the automatic brake application. This circuit activates the parking brake automatically upon loss of brake accumulator pressure, converter oil pressure, or when electrical power to the parking brake solenoid is interrupted. When the brakes are automatically applied, you must manually apply (depress the parking brake switch) the brakes prior to getting out of the vehicle.

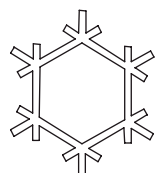


DANGER Always apply the parking brake before getting out of the vehicle. When the parking brake light is flashing, that is an indication that you did not set the brake.

As an added safety measure, if for any reason the engine is turned off, the parking brake will automatically be applied. If you forgot to set the parking brake prior to shutting off the vehicle, the engine will not start until the parking brake switch is depressed.

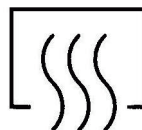
Overhead console in vehicles with SS Cabin compartment

Air conditioner on/off



This two position switch controls the air conditioner. Down is off. The Up position activates the cooling system.

Climate control



5574483900.00

This rotary dial controls the cabin temperature. Turn clockwise to increase temperature and counter-clockwise to decrease temperature.

Heater Hi/Lo



The heater fans are activated by this toggle switch: Low and High.

Defroster switch



The defroster fans are activated by this three-position toggle switch: Off, Low, and High.

Dome light switch



This switch controls the cabin dome light. The light can be set to regular and extra strength.

Windshield washer controls



Three switches control the windshield washing system and they are clearly labelled. One switch controls the washer, while there are separate switches for front and rear wipers.

Emergency steering (option)

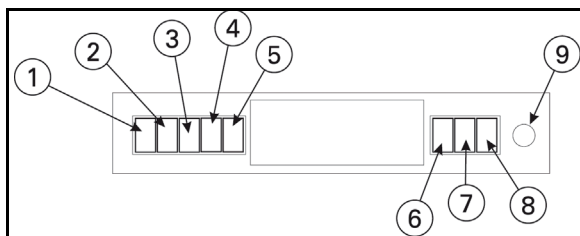


Emergency steering warning light and warning buzzer: Is activated by the pressure switch on the accumulator charge valve:

When the steer pump pressure is too low (steering malfunction) the Emergency steering light and buzzer (visual and audio warning) is activated to alert that the operator is now steering on stored accumulator pressure only. The operator must immediately come to a safe stop.

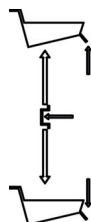
When turning off the ignition wait for the light to turn off to verify that the steering system is bleeding off. When the light is on it indicates that the steering system is still under pressure. If the light stays on for more than 2 minutes contact your maintenance personnel.

Overhead Console (SS Cab)



1. Plug
2. Dome Light
3. Front Wiper
4. Washer
5. Rear Wiper
6. Defrost
7. Heater Hi/Lo or Plug
8. A/C On/Off
9. Climate Control

Dump Control Lever



This lever controls the movement of the dump box or of the tailgate and both stages of the teletram system, according to the type of truck. Location and operating direction may vary depending on the configuration of your vehicle.

The Standard configuration for the dump lever is to the right of the operator seat.

Moving the dump lever back will raise the dump box or extend the ejector tray.

Moving the dump box forward will lower the dump box.

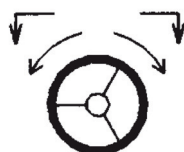
The dump lever has two positions in the lowering mode, first position is power down mode which retracts the cylinder by hydraulic pressure. The second mode is float in which the weight of the dump box is used to retract the cylinders.

Teletram vehicles are equipped with a button on top of the Dump Control lever, which activates the tailgate. Pressing the button while pulling back on the lever opens the tailgate. Release the button while continuing to pull on the lever, and the push plate and 1st stage box will eject the load.

To return the box to the position for loading, first push forward on the lever to retract both stages of the box. Then press the button on top of the lever while continuing to push forward to raise the tailgate.

Steering Control

Wheel steering control



The steering wheel provides steering control turning the wheel clockwise or counterclockwise. The vehicle will turn right if the wheel is rotated clockwise and left if rotated counterclockwise regardless of whether the vehicle is traveling forward or reverse.

Monostick steering control



The monostick steering control lever provides steering control by forward and rear positioning of the lever. Forward movement turns the vehicle to the right, and rear movement turns the vehicle left.

Transmission control

Dual function lever

This dual function lever is located to the left of the steering wheel. The lever can be shifted back and forth and rotated. Shifting positions of the lever chooses between forward, neutral and reverse, while rotating the lever chooses between the four (4) speed ranges of the transmission from first gear to forth gear. The lever can be shifted to the best speed range for the job while the Minetruck is in motion.

APC100 Automatic control

Some trucks are equipped with an automatic transmission control system. These vehicles use the same dual function rotary transmission control lever. The operator can select a gear and the APC100 will monitor vehicle conditions and automatically select the appropriate gear, up to that selected range by the operator. With the APC system the converter lockup will be automatically controlled.

Throttle control

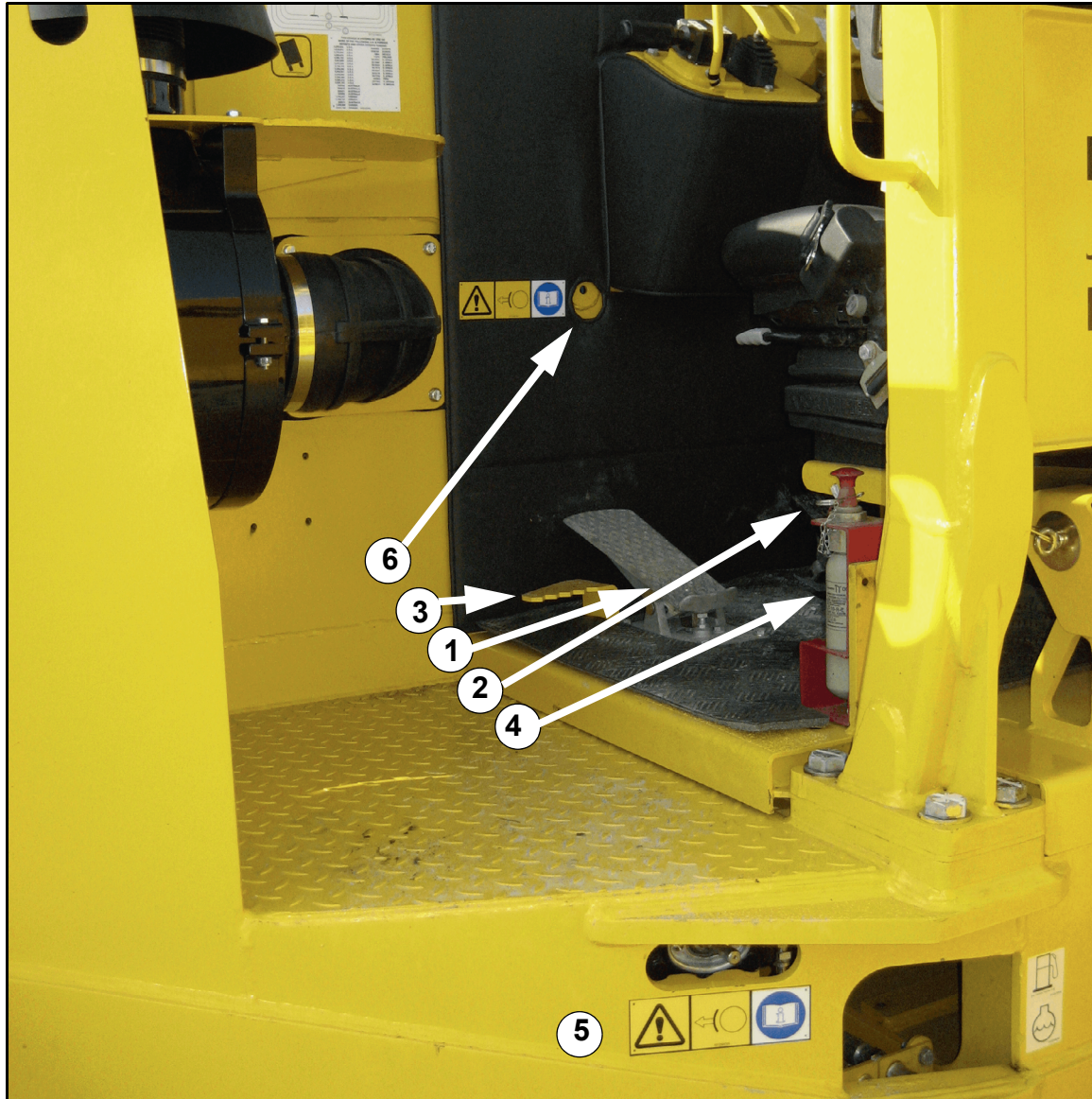
Accelerator pedal

Electronic throttle control

The accelerator pedal operates a spring-returned rheostat controller attached to the DDEC. This control is infinitely variable between low idle and full throttle.

Hand and Foot Controls

SS Canopy (MT431 and MT436B)



1. Brake Pedal
2. Throttle Pedal
3. Foot Rest
4. Fire Suppression Actuator
5. Hand Pump
6. Sahr Brake Override Valve

FS Cabin (MT431 and MT436B)



1. Brake Pedal
2. Throttle Pedal
3. Dump Control
4. Foot Rest
5. Wiper/Washer Bottle
6. Fire Suppression Bottle Actuator Cab
7. Sahr Brake Override Valve Behind Hole

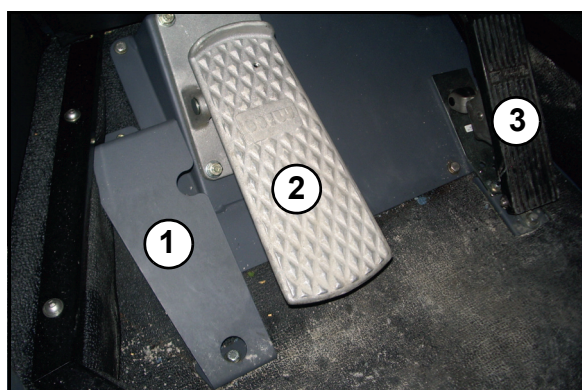
FS Canopy LP (MT436B)



- 1. SAHR Brake Override
- 2. Dump Control
- 3. Throttle Pedal

- 4. Brake pedal
- 5. Electric Shift
- 6. Monitor for Cameras

Foot Controls



- 1. Foot Rest
- 2. Brake Pedal
- 3. Throttle Pedal

Brakes

SAHR Brake Pedal

All vehicles equipped with SAHR brakes, the brake pedal operates a hydraulic brake valve which directs hydraulic oil through the all hydraulic brake circuit to control the front and rear wheel brake assemblies. In the SAHR system, hydraulic oil is supplied to the brakes, keeping them released. Depressing the brake pedal vents oil from the wheel-end assemblies back to the hydraulic tank, and the springs apply the brakes.

Miscellaneous Systems

Video Systems (option)



Monitor

Fire Suppression System

See OEM manual for more information.

Actuator

The vehicle may be equipped with a fire suppression system consisting of one or two extinguisher bottles, four (4) or more remote spray nozzles and two (2) or more actuators. Each actuator is fitted to a charging cartridge and a safety pin. Normally one actuator is located in the operator's compartment, the other at or near the engine compartment.

To actuate, remove the safety pin and repress the plunger. When either actuator plunger is depressed it will puncture the pressurized cartridge and actuate the extinguisher system.



SS Canopy



FS Canopy LP (MT436B)



Fire suppression actuator in cabin/FS canopy LP is located close to door opening.

System description

The fire suppression system is designed to protect specific fire hazard areas on the vehicle. It is intended to supplement, not replace, a sound fire prevention policy in the mine. Fire prevention depends on regular inspection and maintenance of those areas on the vehicle where a fire is most likely to start; the wheel ends, the motor tub, the transmission, and the torque converter. Daily shift maintenance should include the cleaning of areas where flammable materials and combustible debris may collect.

In the event of fire



This decal is located above the fire suppression actuator.

Follow all local fire emergency regulations. Before exiting the vehicle:

- STEP 1** Shut off the ignition.
- STEP 2** Set the brakes.
- STEP 3** Pull the ring pin on the manual actuator.
- STEP 4** Strike the red button.
- STEP 5** Evacuate the vehicle.
- STEP 6** Stand by with a fire extinguisher.

When either actuator plunger is pressed it will puncture the pressurized cartridge and release fire suppression chemicals. The expellant gas pressure makes the dry chemical extinguishing powder act like fluid. The dry chemical powder is propelled through the distribution hose after pressure in the dry chemical tank reaches the point to rupture the bursting disk.

The dry chemical extinguishing agent is discharged through the nozzles into the protected areas, suppressing the fire.

Portable Fire Extinguisher

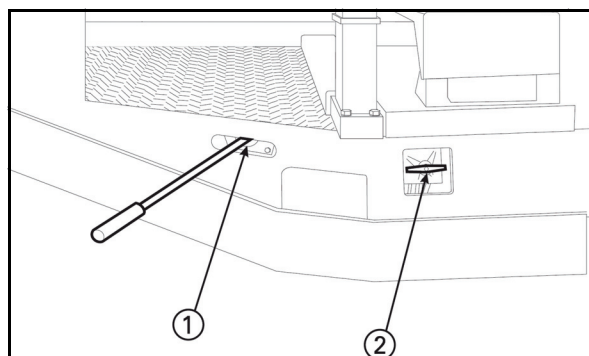
In addition to installed fire suppression systems, always have a reliable hand-held fire extinguisher mounted on the vehicle.

Make sure that portable fire extinguishers are firmly mounted in a readily accessible and safe place. All visual seals must be in place, and the distributor certification tag must be attached and readable.

Brake Pump-Off Hand-Pump

To release the SAHR breaks for towing, the operator may first need to pressurize the hydraulic system using the hand-pump. The handle for the pump is located in the operator compartment. See *“Brake override knob”* on page 43.

MT-436B



1. Hydraulic hand pump
2. Battery isolation switch

SAHR Brake override system

The SAHR brake override system provides a means to tow the vehicle if needed. To tow the vehicle, depress the OVERRIDE button located in the operator's compartment. A minimum accumulator pressure of 100 bar must be available for the override system to operate.

The system consists of an onboard manual Hydraulic Pump for pressurizing the system, and a SAHR Brake Override Control button.

To activate the system, the operator must be sitting in the operator's seat and depressing the control button by hand. The control button is located in the operator compartment.

Caution Care should be taken not to depress the SAHR Brake Override Control button when entering or exiting the vehicle. This will cause accidental release of the brakes.

If there is not enough pressure available in the accumulator, pressure can be supplied to the accumulators by the hand pump. To charge the system, switch the pump to the ON position operate the pump with the handle provided, until the desired pressure (approximately 138 bar is obtained in the accumulator. The pump has a built-in relief valve to prevent over-pressurizing the brake housings.

Releasing the override control will immediately vent system pressure to the hydraulic tank, and reset the brakes.

Seat Controls

Seats will vary from vehicle to vehicle, and comfort controls for seat adjustment can range from a single knob under the front of the seat to numerous knobs and levers. Here are some of the many controls you might encounter.

Armrest controls

- Rotate the armrest controls to change the angle of each armrest.

Backrest control

Rotate the backrest control handle upward and hold, while selecting the backrest angle. Release the control to lock in position.

Seat height adjustment, front and rear

- Lift the front or rear control up and adjust the seat height and angle. Release the control to lock the seat in position.

Front/rear seat adjustment control

- Rotate the control up and adjust the seat forward or rearward. Release the control to lock the seat into position.

Operator weight control

- Rotate this control knob until your weight is shown on top of the knob. This will give maximum suspension performance.

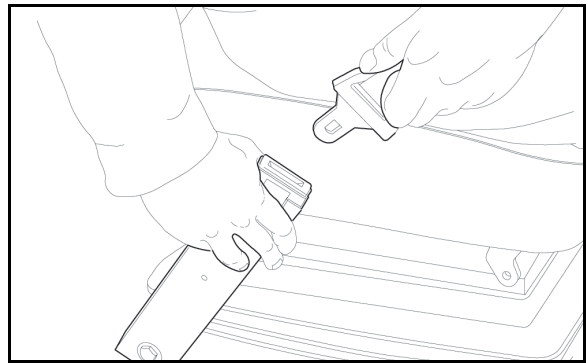
Seat Belts



DANGER An accident or sudden vehicle movement can cause injury or death. Before you start the engine in this vehicle, always fasten and adjust the seat belt. Park the vehicle and stop the engine before you release the seat belt.

Check the condition of the seat belts and seat belt mounting hardware before you start each day. Replace any parts that are damaged or missing.

Adjust both ends of each belt. When fastened, the belt must be snug but not too tight. If your belt has an anticreep device, always adjust correctly to remove all slack.



Fasten seat belt

Pull the left belt out of the holder and push the blade into the buckle on the right side. Make sure the belt buckle is secure.

Release seat belt

Depending on the type, either push the button on the side of the belt buckle, or lift the top flap, to release the seat belt.

Chapter 4: Operating Instructions

WARNING Before you start the engine and operate this vehicle, make sure you have read and understand the operation of the vehicle. Make sure you have read and understand all the safety messages in the operator's manual, safety manual and the safety decals on the vehicle.

WARNING It is your responsibility to understand and follow the manufacturer's instructions on vehicle operation, service, and safety. Be sure you observe all laws and regulations that are on your job and in your operating area. Injury or death can result if you do not follow these instructions. See your Atlas Copco sales company or authorized dealer if you have any questions.

Introduction

You, the operator, have a key position on the mining team. Skill and alertness on your part are essential for maximum productivity as well as the safety of yourself and others. The operating instructions in this manual are given to help you get the maximum use of your vehicle with the greatest possible safety. Become completely familiar with all operating controls and indicators. Learn the vehicle, its capabilities and limitations. Study the operating techniques given so that, through experience, you can develop additional techniques of your own and contribute to the success of your team.

Safety First

Your teammates depend on you to “maintain safety during operation”. Before operating the vehicle, study the safety precautions at the beginning of this Operator's Manual and observe the safety precautions given in this section. This machine can kill or injure you and anyone around it if operated improperly or carelessly. Be a safe operator. A good safety record can be rewarding.

Safety Instructions

In areas where auxiliary ventilation is used, make sure that the fans are operating before starting the vehicle.

Never operate an engine that is smoky, running unevenly or if the exhaust system is not in good condition.

Never start a vehicle that you feel is mechanically unsafe.

Make sure that the vehicle is equipped with standard safety equipment such as a horn, front and rear lights, fire extinguisher, seat belt and, in some cases, wheel chocks.

Never allow riders in the box or any other part of the vehicle.

Make sure that all persons are clear of the vehicle before starting or placing it in motion.

Speed ranges may be selected while the vehicle is in motion. However, do not change direction (i.e. forward/reverse) while the vehicle is in motion. Come to a complete stop before changing direction to prevent damage to the torque converter, transmission and other drive line components.

Never travel with the box raised off the stops.

Read the operator's manual

Follow all instructions carefully. Learn to properly use your controls and indicators. It will make your job easier.

Vehicle Inspection

- Safety Checks
- Preventive Maintenance Checks
- Prestart Checks
- Poststart Checks and Tests
- If You Have a Mechanical Failure While Traveling

Immediately apply the service brakes. If the brakes do not function, apply the emergency brakes. If the vehicle still does not stop, steer the vehicle against a wall.

Know your work area

Check to make sure that all travel ways are clear of obstructions such as rocks, timber, etc. Know the limitations of the vehicle.

Make sure that proper side clearances are maintained. When operating around blast areas, keep the engine running. There is always the possibility that the vehicle cannot be started and moved in time after a charge has been set.

Never use controls as mounting assists

Use of equipment controls as mounting assists is a dangerous habit which can result in serious injury to personnel and damage to the equipment.

Check your safety equipment frequently

Make sure that your vehicle is equipped with standard safety equipment such as a horn; lights (front and rear), fire extinguisher and seat belts.

When traveling up or down a ramp

Use LOW gear on steep ramps. Go down a ramp at the same speed and gear you would go up in.

Give loaded vehicles the right-of-way

It's much easier for you to stop an unloaded vehicle. Reduce speed and sound the horn before turning blind corners.

Driving Practices

A proper tire maintenance program and maintaining haulageways in good condition cannot guarantee optimum service life of tires. Poor driving practices are a major cause of excessive wear and permanent damage.

Drivers can help to reduce tire costs by:

Avoiding obstacles and keeping away from chuckholes or other hazards, which can damage tires.

Not climbing or driving up on the ore pile. Such practice subjects tires to cutting and concentrated impact. Operators should lower the bucket when approaching the ore pile, to clear the work area.

Preventing excessive braking. Heat developed by braking may be transferred to the beads (and/or inner liner of tubeless tires), causing these areas to become charred or cracked.

Not letting tires rub against side walls or against barriers erected to facilitate unloading.

Avoiding taking turns at high speeds and driving in the lowest gear applicable.

The driver who drives carefully and who makes a reasonable attempt to prevent tire damage saves a substantial amount of money on tire costs.

Pre-Starting Procedures

Before starting the vehicle, review the shift maintenance check list to make sure that your machine is ready for operation. This will help to protect you and others, as well as the equipment. In addition, it can increase the efficiency of your vehicle. A recommended check list is given in “Before Each Shift”. However, you may want to add to this list as you gain experience as a qualified operator.

Walk-Around Inspection

Do the following checks to the vehicle before you start each day or shift:

- Check the articulation lock(s) and make sure it is in the proper STORAGE position.
- Check for oil or fluid leaks under the vehicle.
- Check each tire for damage and the correct air pressure.
- Check the engine area and remove all debris.
- Check the condition of all hoses, make sure none are damaged or leaking.
- Look under the vehicle and check for damaged, cracked, or missing parts.
- Clean all steps, walkways, and hand rails.
- Perform all shift service activities.
- Check that the engine hood and all access doors are securely latched or closed.
- Check that all safety signs are clean and not damaged. Make sure that all signs are present before operating the vehicle.
- Clean the operator’s compartment and remove all loose items.
- Repair, replace or adjust any item as required before you operate the vehicle. If you have any questions, see your Atlas Copco sales company or dealer for help.

Prestart Checks

Check engine oil level

Dipstick is located on the right side of the vehicle. To obtain an accurate dipstick reading, the engine must have been shut down for a minimum of 5 minutes.

Note *Do not add engine oil until level is below the add mark on the dipstick. A major cause of engine oil consumption on a Detroit engine is overfilling the crankcase.*

Note *Some older model engines will have dipsticks with two dots following the words FULL and ADD. Correct engine oil level is indicated between these dots. Do not use the words as indicating marks.*

Important *Failure to promptly add oil when indicated may result in serious engine damage due to piston and bearing seizure.*

Check radiator coolant level

Vehicles with DDEC engines usually come equipped with a cross-flow radiator and surge tank. Coolant level is automatically monitored at the surge tank and a low level condition will indicate with a RED Stop Engine warning light when the On/Start switch is turned to the ON position. Pressing the Engine Override button will provide an engine error code indicating that coolant level is low. To check coolant prior to starting the engine, unscrew the surge tank filler cap and view coolant level. Coolant level should be within a 1/2 inch (13mm) of the bottom of the fill tube. Sight gauges may also be located on the surge tank if requested.

Note *This system contains a balanced combination of antifreeze, water and a cooling system corrosion inhibitor. If the coolant level is found to be low, contact maintenance personnel for refilling.*

Note *See instructions in Preventative Maintenance Section on checking and adding coolant.*

Caution *Do not remove the radiator cap or surge tank filler cap when the radiator is hot.*

Important *Do not fill with water.*

Vehicle Start-Up



DANGER Make sure that there are no persons around your vehicle before you start the engine. Severe injury or death can result.

Start the engine

When the ignition switch is turned to the ON position, both the yellow check engine light and the red stop engine light will illuminate for 5 seconds. This indicates that the computer controlling the engine is functioning normally. If these lights do not come on when the key is turned on, the engine may not start.

- STEP 1** Observe the vehicle and make sure it is parked in a safe manner and the parking brake is applied.
- STEP 2** Turn the electrical battery isolation switch to ON.



- STEP 3** Adjust the seat and fasten the seat belt.
- STEP 4** Set the Transmission Forward-Reverse lever to the NEUTRAL position.
- STEP 5** Assure the Dump Box Control lever is at NEUTRAL.
- STEP 6** Check that the parking brake is applied. (Parking Brake knob is depressed. Light should come on when On/Start switch is activated.)
- STEP 7** Turn the On/Start switch to ON and check all indicator and warning lamps.
- STEP 8** Sound the horn to warn all persons that you are going to start the engine.
- STEP 9** Turn the On/Start switch to the START position to actuate the starter motor. As soon as the engine starts, release the switch.

Important If the engine does not start, do not actuate the starter motor for more than 20 seconds. Let the starter motor cool for several minutes before trying to start the engine again.

Note The Check Engine (yellow) or Stop Engine (red) warning light may remain on after turning the On/Start switch to the ON position. The operator may continue with the startup procedure with the Check Engine light lit and notify maintenance personnel at the end of the shift. If the Stop Engine light remains lit, the operator can depress the Engine Override button to determine the engine error code and take corrective action or notify maintenance personnel, as appropriate.

STEP10 If the Engine Oil Pressure gauge shows no pressure within 15 seconds, stop the engine and check for the cause.

STEP11 Let the engine idle for several minutes before operating the vehicle to insure effective lubrication.

Important When starting in cold weather conditions, run engine at moderate speed until it has become properly warmed before placing a load on the engine.

Post-start Checks

Transmission oil level

With engine running and oil warm (approximately 93 °C / 200 °F), check level of transmission oil.

Fluid leak check

Check for visible signs of hydraulic oil, fuel or coolant leakage. If leaking hose, fitting or connection is found, shutdown the vehicle and notify maintenance personnel.

Test the service brakes

Put the transmission in second gear by rotating the shift handle. Select the safest direction for the test by shifting the direction handle to forward or reverse mode, and firmly press the service brake pedal and hold. Release the Parking Brake. Slowly press the accelerator pedal to the floor. The service brakes should prevent the vehicle from moving.

Test the brakes



Note The momentary contact switch will return to center when released. Remember to hold the switch in position throughout the test.

The purpose of this test is to verify, with the brake test switch in both position 1 and 2, that the brakes will apply and release properly. Conduct this test before every shift. The following procedures are for both automatic and manual transmissions.



DANGER Use caution when testing the brakes. Never assume that the brakes will hold the vehicle.

Test the parking brake system in position 1

The operator must sit in the driver's seat during the brake test. Before beginning the test procedure, with the engine running, check to see that the service brakes and parking brake will release. The vehicle should roll and move freely when the parking brake is not set and the service brake pedal is not pressed.

- STEP 1** With the engine running, apply the parking brake and push and hold the service brake pedal with foot.
- STEP 2** Turn the brake test switch left to position 1. Hold the brake test switch in the rotated position for the duration of the test for primary solenoid.
- STEP 3** Place the transmission selector in drive. Verify that the gear selector is placed in position 2.

Note Releasing the switch during the test will give a false result.

- STEP 4** Release the service brakes and slowly press the throttle pedal to the floor. The primary parking brake solenoid should prevent the vehicle from moving under full throttle.

Note Do not apply full throttle for extended periods of time. This will cause the transmission to overheat.

If the vehicle moves

The parking brake system has failed the first test.

- STEP 1** Immediately release the brake test switch, remove foot from throttle pedal, and shut down the vehicle.

- STEP 2** Call the maintenance department for repair.

WARNING Do not operate the vehicle until the problem has been resolved.

If the Brakes Prevent the Vehicle From Moving

The parking brake system has passed the first test.

- STEP 1** Reduce throttle and proceed to the second test.

Test the parking brake system in position 2

- STEP 1** Turn the brake test switch to position 2 and hold in position for the duration of the test.
- STEP 2** With the parking brake still applied, push and hold the service brake pedal with foot.
- STEP 3** Confirm that the transmission selector is still in Drive and verify that the gear selector is placed in position 2.
- STEP 4** Confirm that no one has gotten close to the vehicle.
- STEP 5** Release the service brake and slowly press the throttle pedal to the floor. The secondary parking brake solenoid should prevent the vehicle from moving under full throttle.

If the Vehicle Moves

The parking brake system has failed the second test.

- STEP 1** Immediately release the brake test switch, remove foot from throttle pedal, and shut down the vehicle.

- STEP 2** Call the maintenance department for repair.

WARNING Do not operate the vehicle until the problem has been resolved.

If the Brakes Prevent the Vehicle From Moving

The parking brake system has passed the second test.

- STEP 1** Reduce throttle and release the brake test switch.

- STEP 2** Proceed with the service brake test.

Test the Service Brakes

- STEP 1** Apply the service brakes by fully depressing the brake pedal.

STEP 2 Turn the brake test switch left to position 1. Hold the brake test switch in the rotated position for the duration of the test for primary solenoid.

STEP 3 Place the transmission selector in drive. verify that the gear selector is placed in position. Verify that the gear selector is placed in position 2.

Important Releasing the switch during the test will give a false result.

STEP 4 Release the parking brake.

STEP 5 Slowly press throttle pedal to the floor, the service brakes should prevent the vehicle from moving while under full throttle.

Note Do not apply full throttle for extended periods of time. This will cause the transmission to overheat.

If the Vehicle Moves

The service brakes have failed the test.

STEP 1 Immediately remove foot from throttle pedal, let go of the brake test switch, apply the parking brake and shut down the vehicle.

STEP 2 Notify the maintenance department for repair.

WARNING Do not operate the vehicle until the problem has been resolved.

If the Brakes Prevent the Vehicle From Moving

The service brakes have passed the test.

STEP 1 Reduce throttle and release the brake test switch.

STEP 2 Place gear selector in neutral.

STEP 3 Begin normal operations.

Check dump box operation

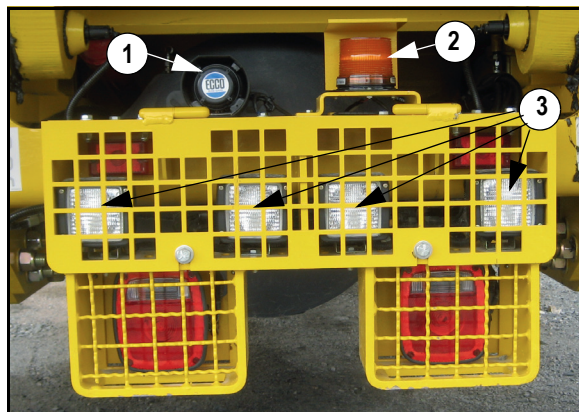
Actuate the Dump Box Control lever(s). Check for excessive play in the controls.

Check for full movement of the box and tailgate through their entire range.

Check lights

Set the light switches to ON and check that the front and rear lights are working correctly.

Rear light/Back-up alarm



1. Back-Up Alarm (Audible)
2. Back-Up Alarm (Visual)
3. Rear Lights

Driving

- STEP 1** Reduce engine RPM to idle speed.
- STEP 2** Move the Transmission Speed Selector to the desired speed range. Always match your speed range to load and road conditions.
- STEP 3** Move the Transmission Forward-Reverse Selector to the desired travel direction.
- STEP 4** Apply the service brakes, then release the parking brake by pulling UP on the Parking Brake knob.
- STEP 5** Make sure that all persons are clear of the vehicle before placing it in motion.
- STEP 6** Release the service brakes and apply even pressure on the accelerator.
- Note** *Never pump the brake pedal. Always keep your foot off the brake pedal when driving.*
- STEP 7** Speed ranges may be selected while the vehicle is in motion. Never change direction while the vehicle is in motion.

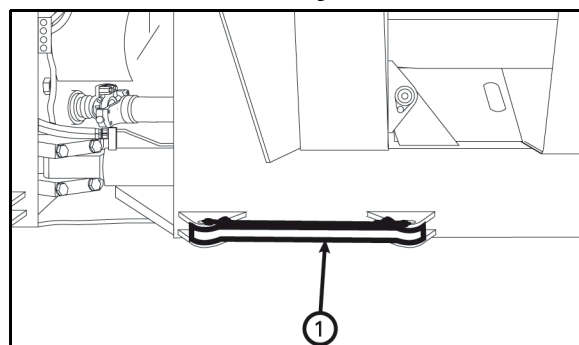
Note *During operation of a vehicle with a Detroit Diesel engine the operator may see a Check Engine (yellow) or Stop Engine (red) light. See "Engine Warning Lights" on page 69.*

Parking and Engine Shut-down

The engine should be idled for a minimum of 2 minutes prior to shutting down. This is to allow for proper turbo charger lubrication and engine cooling. Excessive engine idling, however, should be avoided.

- STEP 1** Stop the vehicle out of traffic lanes, preferably on level ground or turned against a wall.
- STEP 2** Ensure the dump box is in the lowered position.
- STEP 3** Apply the parking brake.
- STEP 4** Set the Transmission Forward-Reverse lever to the Neutral position.
- STEP 5** Allow the engine to run at idle speed for at least two minutes, before stopping the engine. On some vehicles you can stop the engine by turning the On/Off/Start switch to the Off position. On others you will have to pull out the Engine Shutoff handle to cut off fuel to the engine.
- STEP 6** Turn the Start Switch to OFF.
- STEP 7** Set the battery isolation switch to OFF.
- STEP 8** Make sure that the steering accumulators are bleeding down.
- STEP 9** Always install the articulation locking bar in the Locked position before servicing the vehicle, even if the engine is not running.

Articulation safety lock



WARNING *If the vehicle is parked on a slope, make sure that the parking brake is set and the wheels are blocked. The transmission cannot be used as a braking device when parked.*

Vehicle Operation

Safety when driving

Before you drive this vehicle, think about your safety and the safety of those people around you. Be a careful operator; you can prevent accidents.

WARNING *Before each shift, make sure that you check the vehicle controls for correct operation of the steering, brakes, hydraulic system, transmission, etc. A vehicle that runs correctly can avoid accidents. Always make sure that you perform the correct maintenance and inspection before you operate.*

- Adjust the operator's seat and fasten your seat belt. Make sure the seat is adjusted so your back is against the seat cushion and you can push the brake pedal completely down.
- After you have started the engine, check all of the instruments and indicator lamps. Make sure all instruments and indicators are functional and in the NORMAL range before moving the vehicle.
- Check the steering system, parking/emergency brakes, service brakes, box and dump controls. The correct procedures for performing these tests are given above.
- If the weather is below freezing, run the engine at low idle for 5 to 10 minutes before driving the vehicle. If the temperature is -29 °C (-20 °F), allow the engine to run for at least 10 to 20 minutes or until the engine coolant gauge shows normal (green) operating temperature range. Then, use the following procedure to increase the temperature of the hydraulic oil.

Warm-up in cold weather

- STEP 1** After the engine temperature is normal, apply and release the Parking Brake knob to load the hydraulic system pumps.
- STEP 2** Slowly activate the tailgate and dump system. Perform this procedure several times to circulate warm oil to all parts of the hydraulic system.
- STEP 3** Select first gear and drive the vehicle slowly for about 5 to 10 minutes at a reduced speed.

Engine Warning Lights

Check engine light - yellow

- The following conditions will activate the yellow light:
- High Oil Temperature
- Injector Operation
- Low Fuel Pressure
- Engine Overspeed
- System Self Diagnosis

In the event of the yellow light coming on, you may continue to operate the vehicle without fear of engine damage. The yellow light is a diagnostic tool and does not indicate an engine damage situation. The yellow light will go out on its own if the situation is corrected, however the occurrence of the light coming on must be reported to maintenance personnel at the end of the shift.

Stop engine light - red

The following conditions will activate the red light:

- Excessive Oil Temperature
- Low Oil Pressure
- Low Coolant Level
- Low Coolant Pressure
- High Coolant Temperature

When the red light is activated, engine power will be reduced after 30 seconds. Maintenance personnel must be contacted for repair. To prevent serious damage from occurring, the engine should not be operated until approval is given by maintenance personnel.

Miscellaneous Operating Instructions

DDEC Diagnostic Test Button and DDEC Override Button

These buttons are provided primarily for the maintenance department. However, when certain unsafe conditions exist (ex., low oil level), the engine will automatically reduce power. The override button is provided to allow the operator to get the vehicle to a safe location to park it, shut down and call for maintenance.

SAHR Brake Override



To move a vehicle that has no power or clutch pressure, cycle the SAHR Brake Override repeatedly. This allows oil pressure through the relay valve to the brake treadle control valve to release the brakes so the vehicle can be safely moved.

While the override is in use, the brakes can be applied to slow and/or stop the vehicle by:

- releasing the SAHR Brake Override.

or;

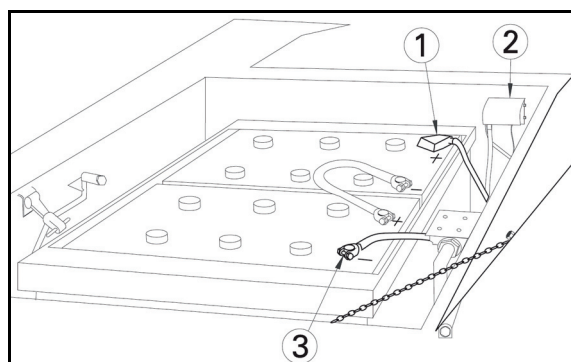
- applying pressure to the brake pedal.

Applying the brakes with the brake pedal will gradually deplete the accumulator pressure.

Releasing the SAHR Brake Override will vent the entire system pressure. If the accumulator pressure is reduced, use the hand-operated hydraulic pump to restore the pressure.

Jump Starting the Engine

WARNING Batteries contain explosive gases and acid. An explosion can result from sparks, flames, or wrong cable connections. Before connecting a charger or jumper cables to the batteries, see the procedure in the operator's manual. Serious personal injury can result if the battery explodes.



1. Positive Terminal (+)
2. Fuse
3. Negative Terminal (-)

Two persons are required for this procedure. Make sure that the person making the connection is wearing face protection as this person will connect to the battery of the vehicle.

- STEP 1** Sit in the operator's seat and make sure the parking brake is ENGAGED.
- STEP 2** Shift the Transmission Control lever or button to NEUTRAL.
- STEP 3** If you are using another vehicle for power, make sure the other vehicle does not touch your vehicle and that the power source is 24 volts DC.
- STEP 4** Have the other person connect the positive (+) jumper cable to the positive (+) battery terminal on the vehicle.
- STEP 5** Connect the negative (-) jumper cable to a good frame ground away from the battery.
- STEP 6** Wait for a few minutes to allow the battery on your vehicle to charge.
- STEP 7** Start the engine and have the other person disconnect the negative (-) jumper cable first and then disconnect the positive (+) jumper cable last.

Towing the Vehicle



Towing point, front



Towing point, front



Towing point, rear



DANGER Towing this vehicle improperly can cause serious injury or death. If this vehicle is disabled, block the front and rear of each wheel and use the recommended procedure in this manual.

The following instructions are for moving the disabled vehicle a short distance to a safe repair area. If you must move the vehicle a long distance, transport it on a suitable trailer.

Important Do not tow vehicle more than one mile.
Do not exceed 3.3 km/h (2 m.p.h.)

STEP 1 Block the vehicle at all wheels to prevent movement.

STEP 2 It is recommended that the towing vehicle be at least as big as the vehicle to be towed. The towing vehicle must have enough brake capacity, weight and power to control both vehicles, taking into consideration the terrain and distance involved.

STEP 3 Inspect the towing bar or towing cable to make sure that the bar or cable is in good condition and there is no damage. Make sure that the bar or cable is strong enough for the towing conditions taking into consideration whether the towed vehicle is loaded, unloaded, on a grade, or stuck in the mud.

STEP 4 Connect a towing bar or towing cable of sufficient size. If towing with a cable, a shield must be provided on the towing vehicle and on the truck if an operator is present during the towing operations. The shield must be strong enough to protect both operators if the cable should break.

STEP 5 In order to provide sufficient control and braking while moving the disabled vehicle downhill, a larger towing vehicle and a solid towing bar are recommended. The Articulation Lock must be installed in the LOCKED position. Additional vehicles may be required at the rear of the disabled vehicle.

STEP 6 If the disabled vehicle is to be towed downhill and needs to be articulated, it is necessary to have a towing vehicle at the front and a vehicle at the rear to control the rear of the disabled vehicle. The Articulation Lock must be in the STORED position if this procedure is followed.

STEP 7 Disengage the parking brake. “See “SAHR Brake Override” on page 71.

Note The parking brake must be disengaged before you move the vehicle or damage to the tires or vehicle may occur.

STEP 8 Carefully remove wheel chocks.

STEP 9 Gradually and smoothly begin moving the vehicle to prevent overloading the towing bar or cable.

STEP 10 Reapply parking brake and chock all wheels once the vehicle is parked.

Transporting the Vehicle

WARNING *If you transport this vehicle on a trailer, the vehicle can slip from the trailer or ramp and cause injury or death. Before you load this vehicle, always make sure that you remove all oil, ice, snow, water, etc., from the trailer or ramp. Slowly and carefully drive the vehicle onto the trailer. Make sure that you center the vehicle on the ramp and the trailer.*

Know the laws and regulations for each area you will be transporting this vehicle through. Also, know all the safety equipment that is required in each area.

Trailer loading instructions

STEP 1 Block each wheel of the trailer.

STEP 2 Carefully and slowly drive the vehicle onto the trailer.

Note *If the vehicle to be transported is inoperable, refer to the instructions on towing if winching aboard the trailer.*

STEP 3 When the vehicle is stopped, install the Articulation Lock Bar in the LOCKED position.

STEP 4 Place the Parking Brake knob in the ENGAGED position and stop the engine.

STEP 5 Remove the key from the vehicle and lock the cabin (if applicable).

STEP 6 Put blocks at the front and rear of each wheel.

STEP 7 Use sufficient chains of adequate size to fasten the vehicle at the front, center and rear of the vehicle.

Important *Do not chain on or over cylinder rods, drivelines or machined surfaces. This can cause damage to the vehicle.*

STEP 8 Measure the vehicle and the trailer to determine width and clearance height.

STEP 9 After driving the load a few miles, stop and check load to be sure that it has not shifted.

STEP 10 Be very careful when you unload the vehicle. Make sure the Articulation Lock is removed.

STEP 11 Drive the vehicle slowly and carefully off the trailer.

General Operating Instructions

Before placing the unit in motion, review the following operating instructions. They will help you receive greater performance from your Minetruck while maintaining safety.

Loading and Unloading

The Dump Control lever controls either the dump box or tail gate and ejector tray, according to the type of truck. The lever location and operating directions depend on whether the vehicle utilizes a forward or side facing operators cab.

Forward facing cabs have a horizontally mounted dump lever to the right of the operator. Moving the lever down raises the dump box or extends the ejector tray. Moving the lever up lowers the box or retracts the tray.

Side facing cabs have a vertically mounted dump lever. Moving the lever toward the operator raises the dump box or extends the ejector tray. Moving the lever away from the operator lowers the box or retract the tray.

Teletram vehicles are equipped with a button on top of the Dump Control lever, which activates the tailgate. Some vehicles have an optional two lever ejector tray and tail gate control arrangement. One lever operates the tray, as described above. The second lever raises (or lowers) the tail gate and operates in the same manner as the first lever (i.e. down or rearward to open and up or forward to close).

Important *Always make sure the tailgate is fully open before ejecting a load.*

When loading, the Transmission Selector Lever should be in N (Neutral) position with the brakes set. When unloading, increase engine speed while raising the dump box or extending the ejector tray.

Caution *Make sure that the dump box or ejector tray is in the fully lowered or retracted position before putting the vehicle in drive.*

Note *Some vehicles are optionally equipped with either a dump box position indicating light and limit switch actuator that remains on until the box/tray is the lowered/retracted position, or a parking brake safety interlock switch that prevents release of the parking brake until the box/tray is in the proper stowed position.*

Converter Lock-Up

The function of the converter lock-up is to mechanically link the engine to the drive train. The benefits of converter lock-up are as follows:

- Increased Speed on Grade.
- Reduced Fuel Consumption.
- Reduced Transmission/Converter Heat.
- Reduces the necessity of using service brakes, when proper gear selection is used on down grades.

The use of converter lock-up is recommended both for up and down grade operation. It should be engaged when the desired gear has been attained and the engine is above 1250 rpm. (The lock-up will not engage when engine speeds are below 1250 rpm) A green light will activate indicating that the lock-up system is engaged.

The converter lock-up will automatically disengage under the following conditions:

- Engine speeds fall below 1100.
- Transmission is shifted from original position
- Lock-up release button is depressed.

If the lock-up should happen to disengage, simply push the on button and the system will reengage.

Tires



- Stand on the tread side, never stand in front of the wheel.



DANGER Excess heat caused by damage or incorrect assembly can cause the tires to explode and propel wheel parts. Stand on the tread side of a tire when performing service.

- The vehicle must be empty before servicing the tires.
- Check each tire for deep cuts, breaks or loose tread. Look for exposed cord. Report any damage to maintenance personnel for corrective action.
- Use a long hose and self-attaching air valve fitting to be outside of the danger zone when inflating the tires.
- Always inflate tires to the recommended pressure.
- Follow approved warm-up procedures for tires before operating vehicles in extreme cold conditions.



DANGER Never mix different size wheel parts. Never use damaged wheel rims or parts. Incorrect modification or rework to wheel rim or parts may result in failure, injury, or death.

Deflate the tire before attempting to repair tire tread or removing foreign objects. If the tire and wheel assembly is removed from the vehicle, always put it into a tire inflation cage before adding air.

Chapter 5: Preventive Maintenance

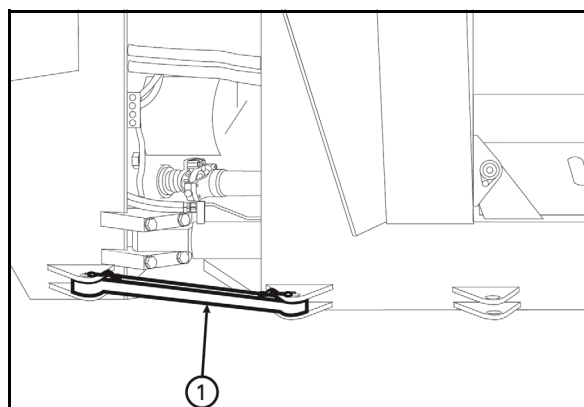
Safety Instructions

Perform Maintenance on Level Ground

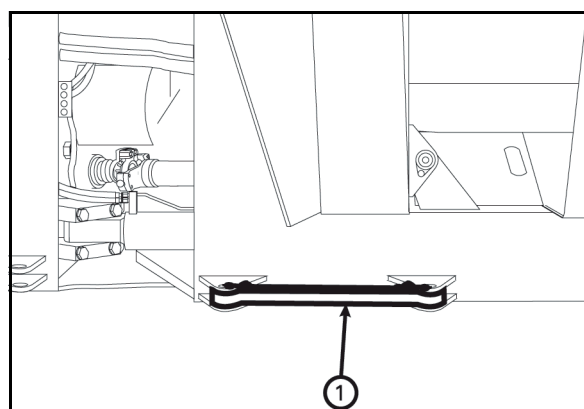
The vehicle should be on level ground whenever possible for maintenance. Before you start, make sure the parking brake has been applied and the wheels are blocked. Keep the vehicle well clear of traffic lanes.

Install Articulation Locking Bar

An articulation locking bar is attached to the frame on either the right or left hand side of the vehicle. Before performing any maintenance in the pivot area of the vehicle, make sure this bar is connected between the load frame and power frame to prevent the vehicle from pivoting.



1. Articulation Locking bar - LOCKED Position



1. Articulation Locking bar - STORED Position

General Safety

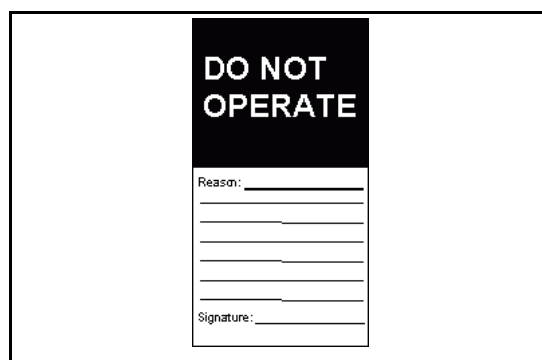
Read the safety and information decals on the vehicle. Also read and understand this operator's manual. You must understand the operation of this vehicle before performing maintenance.

Do not attempt repairs that you do not understand. See the service manual for this vehicle or see your Atlas Copco sales company or authorized dealer for more information.

Use the correct safety clothing and safety equipment. It may be required that you use eye or face protection, ear protection, safety shoes, hard hat, heavy gloves, etc.

Before performing any maintenance on the Minetruck, review the following safety precautions. They're included for your protection.

- STEP 1** Empty the dump box completely and set the parking brake.
- STEP 2** Shutdown the engine.
- STEP 3** Turn the Start Switch and Battery isolation switch to OFF position. Block the wheels.
- STEP 4** If you must service the vehicle in the articulation area with the engine running, always install the Articulation Locking Bar in the LOCKED position.



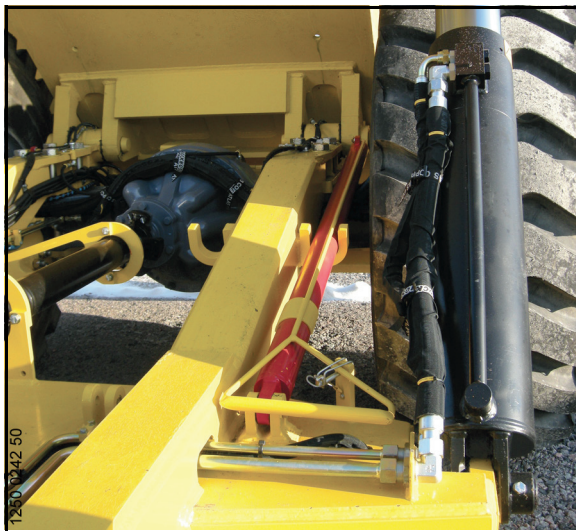
- STEP 5** Before you service the vehicle, always put a DO NOT OPERATE tag in the cabin on the steering wheel or lever. Then, remove the key if one is available.

If you must service the vehicle with the engine running, have a second person help you. The second person must be in the operator's seat during the service or adjustment.

Dump Box Safety Support



MT431



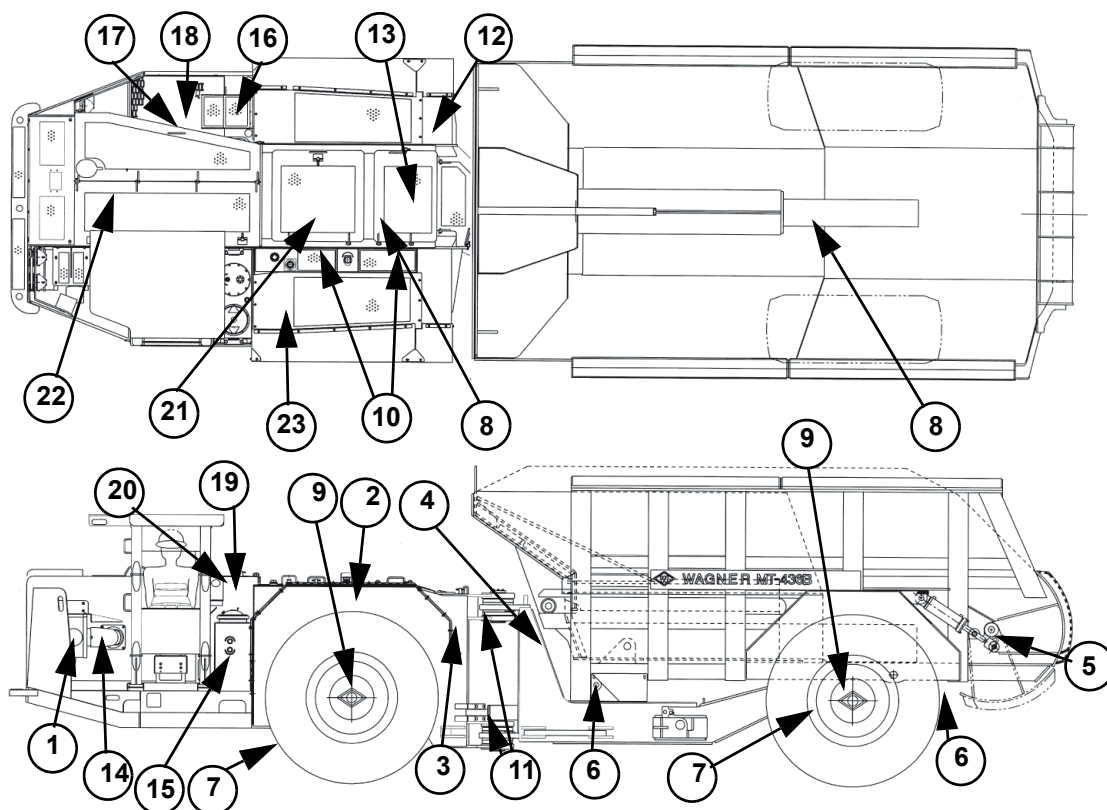
MT436



DANGER The dump box is extremely heavy, use only approved support devices.

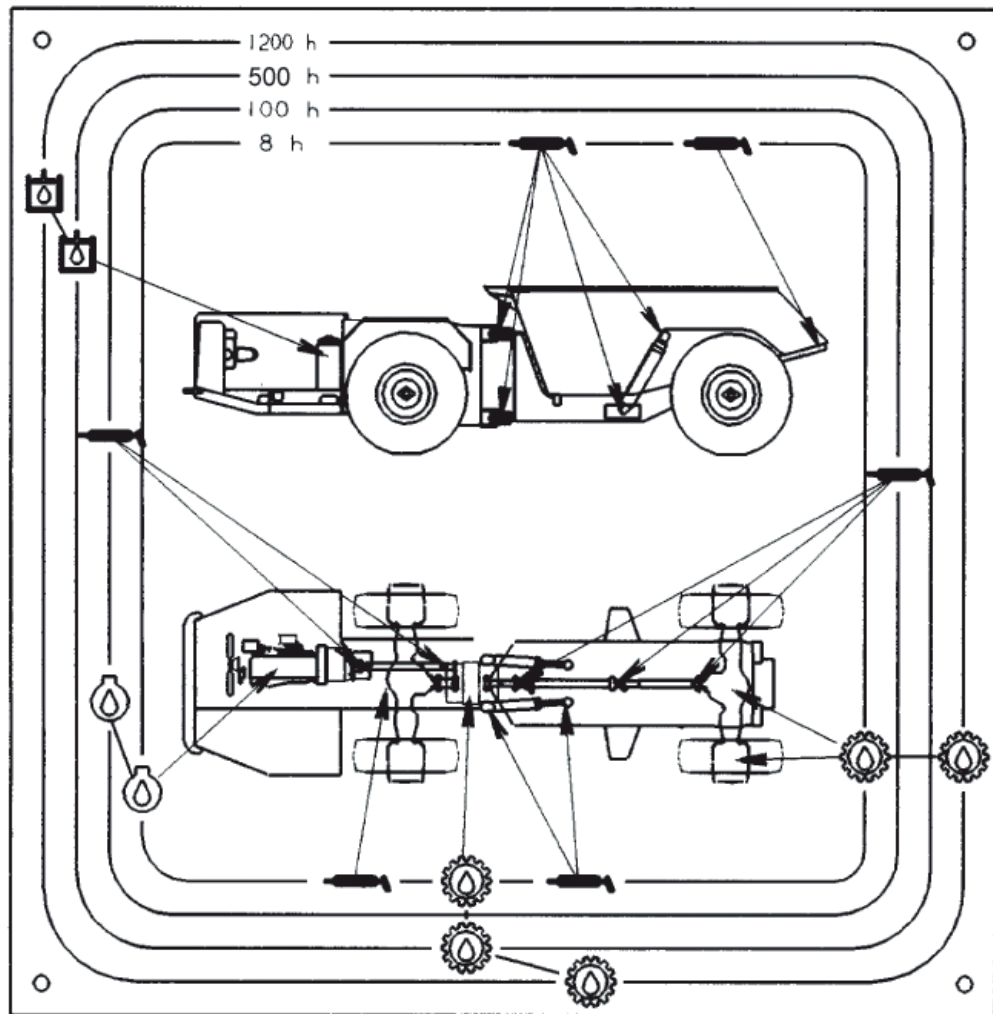
If the Minetruck must be serviced in the load frame area, install the dump box safety support stand before allowing anyone under the raised dump box.

Maintenance Check Points



1. Air Filter — Engine
2. Fuel Tank Level Gauge
3. Power Frame Central Lube Panel
4. Load Frame Central Lube Panel
5. Tailgate Cylinder Stem End — 2 locations
6. Dump Box Mounting Pin Lube — 4 locations
7. Tire Pressure — 4 locations
8. Axle Differential Oil Check Port — 2 locations
9. Axle Planetary Oil Check Port — 4 locations
10. Oscillation Bearings
11. Articulation Bearings — 2 locations
12. Transmission Oil Gauge
13. Transmission Oil Fill
14. Engine Air Filter Restriction Indicator
15. Hydraulic tank Oil Gauge
16. Fuel Water Separator
17. Engine Oil Fill
18. Engine Oil Level Dipstick
19. Hydraulic tank Oil Fill
20. Hydraulic Tank Breather
21. Batteries
22. Engine Coolant Fill
23. Fuel Fill

Lubrication instruction label



This label is located in the operator's compartment and pictorially represents lubrication needs for shift, weekly, monthly, and quarterly service intervals and corresponds to the detail given later in this section beginning with General Maintenance

The regular care a vehicle receives by its operator is generally rewarded by decreased down time and greater reliability. With the help of the information in this section, you should be able to maintain your Minetruck at top operating efficiency. All maintenance and lubrication procedures given can be performed on the job site with a minimum of shop tools.

At the end of every shift, look for loose or damaged hoses and hose fittings. Check for loose nuts, bolts and electrical wiring connections. Check for signs of fresh oil around fittings and under the vehicle. At the first sight of damage or oil leakage, notify maintenance personnel.

Scheduled preventive maintenance and lubrication are required to provide safe and efficient operation of the vehicle. Follow the Lubrication and Maintenance Chart carefully and make sure that all points are serviced correctly and on time.

Fluid Checks

Daily/Shift requirement

- Lube Points
- Fluid Leaks
- Engine Oil dipstick
- Transmission oil (dipstick and sight glass)
- Hydraulic oil tank (sight glass)
- Engine Coolant tank (= surge tank)
- Air intake restriction indicator
- Air Filter Evacuator valve
- Fire Extinguisher



- Transmission oil (sight glass)

Note Use the dip stick to see the correct level!



Engine coolant tank (surge tank)



Hydraulic oil tank (sight glass)



Air filter evacuator valve

Record Keeping

Good record keeping is essential to a proper maintenance program. Each scheduled maintenance form should be checked off as the inspection or procedure is completed. Quantities of replenished lubricants and fluids, and pressure and flow readings, should be recorded.

All discrepancies should be recorded whether remedied or pending. Operators and mechanics should sign off forms and return them to maintenance supervisor for approval and retention in a vehicle maintenance file.

Accurately recorded maintenance forms will give maintenance personnel an overview of equipment condition on an individual or fleet basis.

Good records enable maintenance personnel to identify and evaluate problem and/or high cost areas which can then be targeted for improvements or solutions.

Good record keeping will identify certain items on the schedules which may need to occur more or less often, depending upon the vehicle's operating environment.

Finally, good maintenance records aid in the planning and scheduling of maintenance and repair procedures, which result in the efficient use of maintenance resources and maximum equipment reliability and availability.

Independent Oil Analysis

Atlas Copco highly recommends the regular use of an oil analysis program. Regular oil analysis can indicate problems and approaching maximum wear limits significantly before they are discovered by system performance checks.

The objective of a preventative maintenance program is diagnosis and repair before failure. Good sampling techniques and independent laboratory analysis are considered primary elements of a good program.

Important *Oil analysis is not to be used to determine if oil can be re-used past recommended service life. Change oil during recommended service intervals even when oil analysis shows oil to be up to standards. A comprehensive analysis program can aid in establishing optimum service intervals.*

Shift Maintenance Report

Shown here is a sample shift maintenance report form. A shift maintenance report form must be used to report defects found when making shift maintenance checks at the beginning of each shift.

Your company may have a different reporting method, however, it is recommended that this form be filled out at the end of each shift and returned to your supervisor. Accurate shift maintenance reports can help your company anticipate maintenance problems and take action to prevent costly failures.

Shift Maintenance Report		
Vehicle Model		
Vehicle Number		
Date	Shift No	
Hour Meter Reading		
Clearly state any mechanical failures on this vehicle at end of each shift.		
Fluids Added		
Engine Oil	liters	
Transmission Oil	liters	
Hydraulic Oil Tank	liters	
Coolant tank	liters	
	OK	Defect
Trans Clutch Pressure		
Engine Oil Pressure		
Tire Pressure		
Brakes (Test)		
Volt Meter		
Remarks:		
Name:	No:	
Operator Signature		
Supervisor Signature		

Shift Maintenance Checklist

A recommended check list is given to assist you in developing a sound shift maintenance program if one has not been developed by your company. Perform

these checks at the beginning of each shift. Use the shift maintenance report form to report mechanical defects.

Shift Report

Driver

Hour Meter

Date

Shift No.

Vehicle No.

Vehicle Model

Check Before Starting Engine		Comments
Engine Crankcase	☐ Check oil level ☐ Check for leaks	liters added
Transmission	☐ Check oil level ☐ Check for leaks	liters added
Engine Air Cleaner	☐ Check indicator ☐ Clean or change	
Engine V-belts & Pulleys	☐ Check adjustment and wear	
Radiator	☐ Check coolant level ☐ Check for leaks	liters added
Fuel Tank	☐ Fill & check for leaks	
Fuel Filters	☐ Drain off water	
Hydraulic Tank	☐ Check level ☐ Check for leaks	liters added
Battery	☐ Check electrolyte level	
Tires	☐ Check condition ☐ Check pressure	
Wheels	☐ Check for loose or missing lug nuts	
Hoses	☐ Check for leaks and abrasions	
Fire Extinguisher	☐ Check indicator and seals	
Fire Suppression System	☐ Inspect hoses, nozzles, and valves.	
Check After Starting Engine		Comments
Engine	☐ Does it sound normal?	☐ Oil Pressure OK ☐ Defect
Cooling System	☐ Check for leaks	☐ OK ☐ Defect
Oil Leaks	☐ Check and report	☐ OK ☐ Defect
Fuel Leaks	☐ Check and report	☐ OK ☐ Defect
Transmission	☐ Check oil level with engine idling at normal operating temperature in NEUTRAL gear	☐ Oil Pressure OK ☐ Defect
Air Intake System	☐ Check for leaks or damage	☐ OK ☐ Defect
Exhaust System	☐ Check for leaks and smoke	☐ OK ☐ Defect
Lights	☐ Clean lenses and check operation	☐ OK ☐ Defect
Parking/Emergency Brake	☐ Test against engine power	☐ OK ☐ Defect
Service Brakes	☐ Test against engine power	☐ OK ☐ Defect
Horn	☐ Check operation	☐ OK ☐ Defect
Control Levers	☐ Check operation	☐ OK ☐ Defect

Maintenance Intervals

As required

- Radiator—clean exterior
- Cab, box, and frames—check for damage, missing parts or cracks
- Circuit breakers or fuses—reset or replace
- Windshield wipers and washer fluid (on cab-equipped vehicles)—replace or refill

Before Each Shift

- Check fuel gauge—fill tank as necessary
- Engine—check the engine oil level
- Transmission—check the transmission oil level
- Fuel water separator—check for water
- Hydraulic tank—check the oil level
- Hoses—check all retaining clamps properly installed.
- Tires—check condition
- Fire extinguisher—check
- Alternator drive belt—check
- Engine fan drive belt—check
- Air filter evacuator valve—check
- Engine air filter—check filter restriction indicator
- Cooling system—check the coolant tank level
- Grease the following fittings
 - Steering cylinders, base ends (2) fittings
 - Steering cylinders, stem ends (2) fittings
 - Dump cylinders (4) fittings, 2 each cylinder
 - Oscillation bearing (2) fittings
 - Articulation bearings (2) fittings, one each pivot
 - Dump box pivot pins (2) fittings, one each pivot
- Autolube system—check grease tank level

Note If the vehicle is equipped with an optional auto-lube system, verify that the fittings are receiving lubrication.

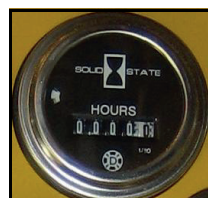
Every 50 Hours Of Operation

- Fire extinguisher - Loosen the powder in the fire extinguisher once a week by shaking.
- Tires—check air pressure

Every 100 Hours Of Operation

- Engine air filter—replace the primary (outer) filter
- Test supplemental coolant additive
- Batteries—check voltage balance
- Batteries—check fluid level
- Batteries—clean battery terminals and connections
- Hydraulic tank breather—inspect
- Transmission breather—inspect
- Axle breathers—inspect
- Axles—check the oil level of all planetaries and differentials
- Brake cooling oil tank breather—inspect
- Brake cooling oil tank level—check
- Wheels—check lug nut torque
- Grease driveline slip joints and universals
- Steering pins and articulation pin caps—check bolt torque
- Fire Suppression system—check dry chemical level, gas cartridges and nozzles

Hourmeter



The engine hourmeter shows the amount of time in actual hours the engine has run. The numbers on the right show tenths of an hour and the remaining numbers show hours. Check the hourmeter often to make sure all required services are done at the correct time.

Maintenance Instructions

Fuel System

Intervals

Check/Fill fuel tank	Before each shift.
Draining water from the fuel filter	Before each shift.
Fuel filter replacement	Every 100 hours of operation

Note The DDEC has injector monitoring. Atlas Copco recommends that vehicles equipped with DDEC should rely on DDEC troubleshooting results to determine injector change intervals.

Fuel tank level

Fuel level should be checked at the start of each shift. A level gauge is usually located on the tank, near the fill port. On larger trucks equipped with two tanks, each tank must be checked. Upper and lower sight glasses are provided for this.

Note Most engine manufacturers recommend that the fuel tank be kept full to prevent condensation in the tank. Atlas Copco recommends refilling the tank(s) at the end of each shift.

Important Always shutdown engine when refueling vehicle or working on fuel system.

Fuel/Water separator filter

On vehicles equipped with DDEC engines, the Primary fuel filter also acts as a fuel/water separator. It should be checked before each shift.

Inspect bottom view glass on filter.

If water is present, open the drain valve on the bottom of the fuel filter and drain water from the fuel filter.

Close the drain valve.

Drain water from fuel tank

Loosen the drain plug on the bottom of the fuel tank and check for water after every 500 hours of operation or if a significant amount of water is found in the primary fuel filter.

Caution If the fuel tank is full, there will be high pressure on the drain plug. To remove the water, only loosen the plug. Do not remove the plug.

Note Large trucks will have two fuel tanks mounted behind the engine on either side of the vehicle.

Replace fuel filters

Replace the fuel filters every 100 hours of operation.

Clean the outside of both fuel filters and the area around each filter.

Clean the strainer screen in the fuel tank filler.

Turn the two fuel line shutoff valves 90° to the OFF position.

Turn each filter counterclockwise and remove from the filter head. Discard the old filters.

Use a clean cloth and wipe the mounting surface of each filter. Make sure this area is clean.

Apply a thin layer of clean oil to the gasket of each new filter.

Fill each new filter with clean diesel fuel and install each filter.

Turn each filter clockwise to install. When the gasket of each filter touches the filter head, continue to tighten each filter 2/3 turn.

Note See the next topic to bleed air from the fuel system

Bleed air from fuel system

Air must be removed from the fuel system if the engine runs out of fuel, if the fuel filter been changed, or the vehicle has been in storage for more than three months.

Fill the fuel tank (or add a minimum of ten gallons of fuel to the tank).

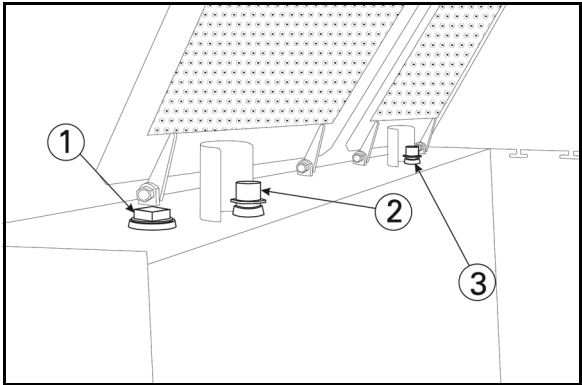
Clean the area around the air bleed plug(s) on top of the primary fuel filter. Remove the air bleed plug(s) on the top of the primary fuel filter.

Operate the hand primer pump until you see air free fuel coming out of the plug hole.

Install the plug(s) and start the engine. Run at idle speed and check for fuel leaks.

Continue priming if the engine fails to start immediately.

Caution When performing any checks or maintenance on the fuel system, be certain to clean up all fuel that has spilled on the engine or vehicle.



- 1. Plug
- 2. Fuel Level Gauge
- 3. Fuel Filler

Engine Oil System

Intervals

Oil level check	Before each shift.
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Engine oil level

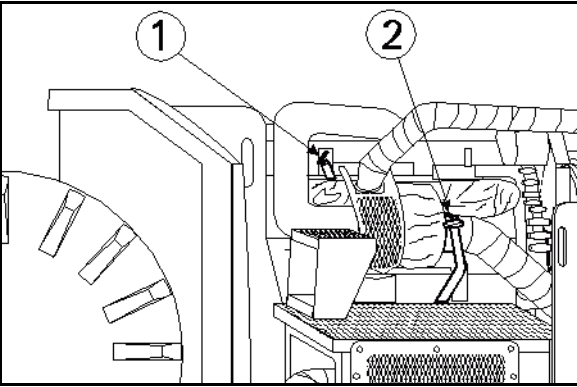
The engine lubricating oil should be at the FULL mark on the dipstick. To accurately check the oil level, stop the engine and allow for the oil to drain off engine internal parts (at least 20 minutes for Detroit Diesel engines). This eliminates the possibility of overfilling. When checking the oil level, make sure that the area around the dipstick is clean and the vehicle is setting on level ground.

Push the dipstick completely down and pull out. (See [“Prestart Checks” on page 61](#). for determining proper level indication and need for additional oil.)

If the oil level is below the ADD mark, add oil to raise the oil level up to the FULL mark on the dipstick.

Note Do not add engine oil until level is below the ADD mark on the dipstick. A major cause of engine oil consumption on a Detroit engine is overfilling the crankcase.

Important Failure to promptly add oil when indicated may result in serious engine damage due to piston and bearing seizure.



- 1. Engine Oil Dipstick
- 2. Engine Oil Fill

Air Filter System

Intervals

Evacuator valve check	Before each shift.
Service indicator check	Before each shift
Primary filter inspection	Before each shift.
Filter element service	Replace the primary element if the filter restriction indicator reads in the red or every 100 hours.

Important Always service the air filter system with the engine stopped. You can damage the engine severely with dust and debris.

Dry type air filter

These engine air filters consist of a cyclonic-type, dry air filter. A service indicator shows the condition of the filter. The indicator will show in the GREEN zone when the filter is clean. The indicator will show RED when the filter is restricted. Check the service indicator after starting up the vehicle prior to the start of each shift. If RED appears in the indicator window, replace the primary air filter element and press the reset button on the indicator.

Important Air filter indicator can be damaged if stepped on. Care should be taken when working around air filter housing.

Primary (outer) filter element

Replace the outer filter element when air restriction is in the red or every 100 hours of operation.

Note Replacement of primary filter will vary according to operating conditions. Initially, filter should be inspected each shift, to determine proper frequency.

Loosen and remove the air filter cover.

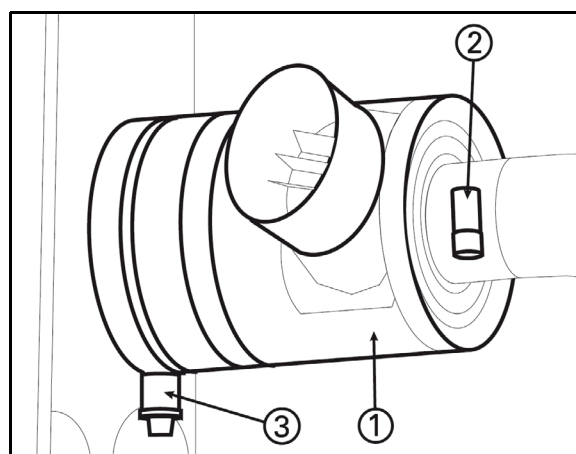
Loosen and remove the outer filter element wing nut and remove the element.

Inspect filter housing gasket sealing surface for signs of damage. Replace housing if needed.

Install a new primary element. Rotate the element as you tighten the wing nut to make sure there is a good gasket seal.

Reset filter service indicator.

Start the engine and run it at high idle speed. If the filter service indicator indicates red again, replace the inner filter element.



1. Filter Housing
2. Restriction Indicator
3. Evacuator Valve

Evacuator valve

Check and clean the evacuator valve before every shift. Make sure there is no obstructions inside the evacuator valve. Check the evacuator valve more often when you operate in severe dust or wet conditions.

Pre-cleaner

Note Some vehicles may be equipped with an Air Intake Pre-cleaner for operation in extreme environments.

Pre-cleaner should be inspected periodically for dust and dirt buildup. This will help prolong the life of the air filters.

Loosen and remove pre-cleaner from air filter housing.

Shake or blow out with air to remove any dirt or dust that has accumulated. Wear eye/face protection.

Re-install in vehicle.

Cooling System

Intervals

Coolant tank level check	Before each shift.
Coolant system hoses	Every 100 hours of operation

WARNING*Hot coolant can rush out of the radiator or coolant tank and cause serious burns. Check the coolant level only when the system is cool. If you add coolant, turn the radiator or tank cap to the first notch and wait for the pressure to release. Remove the cap and add the coolant.*

Atlas Copco recommends that the coolant mixture contain 50% ethylene glycol and 50% water mixed with supplemental coolant additives. This will protect your vehicle down to -35 °C and will also protect the water pump and engine block from air cavitation. Use this mixture in your vehicle the year-round. If you want to check the coolant mixture in the engine, use a Refractometer. This is a tool that measures the speed of light as it passes through the fluid. Only a few drops of coolant is required to give you a direct freeze protection reading. This tool automatically compensates for the coolant temperature.

If the anticipated outside air (ambient) temperature will be lower than -34 °C refer to your antifreeze distributor and adjust the mixture. Do not use 100% straight antifreeze in this cooling system, 100% straight antifreeze will freeze at -10 °C.

Use an ethylene glycol coolant (low silicate formulation) that meets or exceeds the standard of either GM 6038-M formulation (GM 1899-M performance) or ASTM D 4985 requirements.

Cross flow radiator

Check the water /coolant level in the radiator by viewing the surge tank sight glass. Coolant level should be observable from the upper sight glass.

Note *On trucks equipped with DDEC Series 60 engines, a sight glass is not always provided. Coolant level is automatically monitored and a low level condition will be indicated by the YELLOW Check Engine light.*

Add clean water/coolant as required.

WARNING*Do not remove the cap from the radiator. Check and fill through the surge tank only.*

When operating in cold weather, make sure that the antifreeze content is adequate. Check with maintenance personnel or refer to the coolant specifications in this manual.

Note *Always premix the solution before you fill or add to the system. Do not allow nitrite concentration to exceed 2400 ppm (parts per million) or drop below 800 ppm.*

Coolant system hoses

Radiator hoses should be inspected for loose fittings, leaks and damaged condition every 100 hours.

Replace hoses as required and after every 4000 hours of operation.

Hydraulic System

Intervals

Hydraulic oil level check	Before each shift.
Hydraulic tank breather inspection	Every 100 hours of operation

Hydraulic oil level

Check the hydraulic oil level every shift.

Park the vehicle on a level surface and put the dump box in the LOAD position.

Stop the engine and allow time for accumulator to bleed down.

Vent the tank by loosening the filler cap on top of the tank.

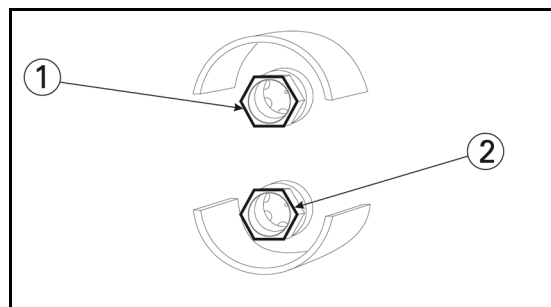
Check the hydraulic oil in the hydraulic tank with all cylinders retracted. Upper sight glass (or sight gauge) should show the bead floating inside the gauge.

Report to maintenance personnel if oil does not appear in upper sight gauge.

Note Do not overfill the hydraulic tank.

Note Hydraulic tank can be filled either through the filler cap or through a quick disconnect fitting, using the accompanying hose and hand pump, depending on the model vehicle.

Hydraulic sight gauges



1. Upper sight gauge
2. Lower sight gauge

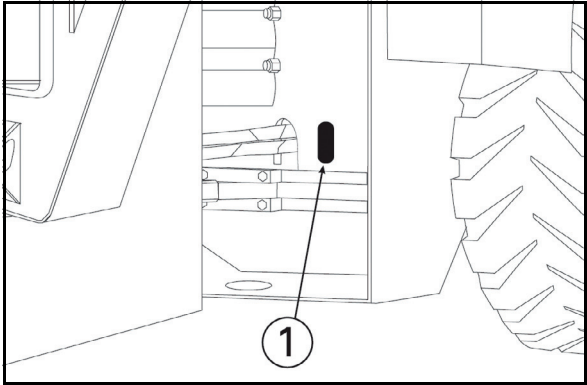
Transmission System

Intervals

Hydraulic Transmission fluid level check	Before each shift.
Breather inspection	Every 100 hours of operation

Important If the vehicle is new or the transmission has been replaced or rebuilt, change the transmission oil and replace the filter after the first 50-100 hours of operation.

Sight gauge



1. Transmission oil sight gauge (MT436B)

Transmission oil level

With the engine running at idle, check the transmission oil level:

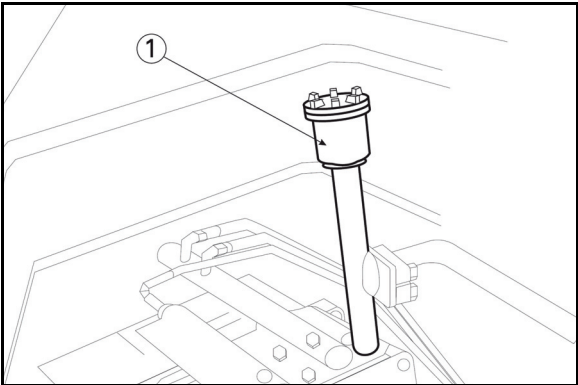
Park the vehicle on a level surface.

Apply the parking brake.

Shift the transmission to NEUTRAL and run the engine at idle speed.

Note On most vehicles, a dipstick and fill tube are located under a hinged cover at the top center of the vehicle. Some models will also include a sight glass. It is not possible to see the correct level through the sight glass.

Correct level is at the FULL mark on the dipstick. Make sure that the area around the dipstick is clean before checking. Never overfill the transmission.



1. Transmission oil fill

Important The transmission oil level must be checked at operating temperature.

Clark	82 °C - 93 °C (180 °F - 200 °F)
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Transmission breather

Inspect the transmission breather every 100 hours of operation. The breather is located on top of the transmission.

Axles

Intervals

Oil level check for all differentials and planetaries	Every 100 hours of operation
Breather check/clean	Every 100 hours of operation

Important *If the vehicle is new or if the axle is new or rebuilt, change the axle oil after the first 100 hours of operation. Then, change the axle oil every 1000 hours of operation.*

Oil check

Important *Check fluid levels when oil is cold. Do not check with hot oil, as incorrect level will be indicated.*

Differential and planetary breathers

Inspect each differential and planetary breather every 100 hours of operation. Make sure the breather is not blocked with debris.

Breathers should be removed and cleaned during every oil change.

Electrical System

WARNING Batteries contain explosive gasses and acid. An explosion can result from sparks, flames, or wrong cable connections. Serious personal injury can result if the battery explodes.

WARNING *WARNING: Before you service a battery, always wear face protection, protective gloves, and protective clothing. Battery acid or battery explosion can cause serious injuries.*

Batteries

The electrical system in this vehicle is 24 volts. Each battery is 12 volts. Before you service any part of this electrical system, always disconnect the (-) negative battery terminal.

Check the battery fluid level every 100 hours of operation. Add clean or distilled water to the battery until the fluid level is up to the split ring of each cell.

Make sure that each battery vent is clean.

Battery isolation switch

This switch isolates the battery from the electrical circuits and should be set to OFF when the vehicle is not in use or during maintenance and repair to help prevent short circuits.

Circuit breakers/Electrical component box

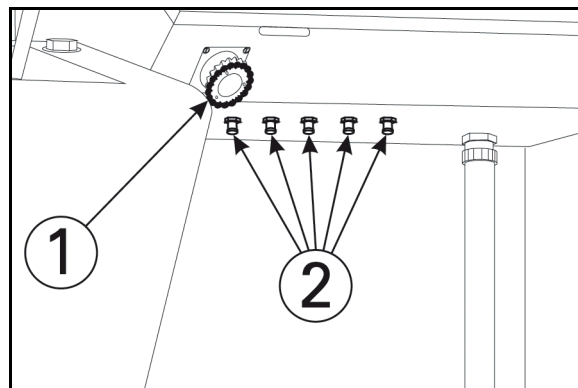
The electrical component box contains fourteen (14) thermal/magnetic circuit breakers which provide “first-line” protection for the electrical system. These breakers are equipped with an internal contact that prohibits reset while the fault still exists, even if the circuit breaker is manually held in the reset position.

The lower amperage breakers in the instrument panel are “push-pull” which allows for manually isolating circuits for troubleshooting.

All breakers are manually reset. Should an electrical fault occur, try resetting the appropriate breaker. If the breaker cannot be reset, contact maintenance personnel to resolve the problem before continuing operation.

Important Do not run the engine with the battery terminals disconnected.

Important To prevent damage to the DDEC electronic control system, disconnect the battery isolation switch and pull the main electrical circuit fuses before welding. Failure to isolate the DDEC system from high current flow can result in severe ECM damage.



1. DDEC Diagnostic Coupler (Capped)
2. Circuit Breakers

Rims and Tires

Servicing

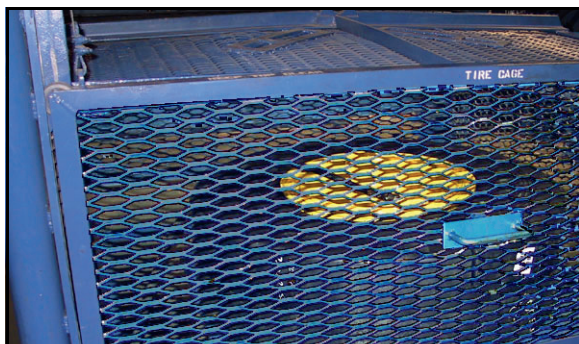


DANGER Tyre and rim servicing can be dangerous. All work on wheels and tyres must be performed by trained personnel using proper tools and procedures. Always keep yourself and others out of the danger areas of tyres and wheels.



DANGER If wheel parts are damaged or improperly installed, air pressure and heat from normal operation are adequate to cause rapid disassembly with explosive force that can injure or kill.

- Deflate the tire before attempting to repair tire tread or removing foreign objects.
- If the tyre and rim assembly is removed from the vehicle, always put it into a tire inflation cage before adding air.



Tyre inflation cage

- Stand on the rolling surface (tread) side of a tyre when you perform service.

Always inflate the tyres to the recommended pressure.



DANGER Tyres and rims can explode and cause injury or death!

The dump box must be empty before servicing the tyres. Check each tyre for deep cuts, breakage or loose

tread. Look for exposed cord. Report any damage to the maintenance department for corrective action.

Important All tyres must be the same size. The rolling radius must never differ more than 5% between two tyres.

Check tire pressure

Always check tire pressure when the tire is cold.

Be aware that in extremely cold temperatures, inflation pressures will vary from those listed in this manual. Contact your Atlas Copco sales company or authorized dealer.

Wheel lug nuts

Make visual inspection of the wheels. Check for loose, damaged, or missing lugnuts and studs.

Lubrication and Miscellaneous Maintenance

Grease points

Lubricate each grease point shown in the shift maintenance diagram every shift or every 40 hours as indicated. Use a high pressure gun, except as indicated on the lubrication checks.

Lincoln Auto Lubrication

Check grease tank

On vehicles equipped with automatic central lubrication, check the level of the grease tank every 100 hours.

Caution Always fill through the fill point. Never open the lid!"

Check distribution block



Distribution block

Check that no red pin sticks out of the pressure indicators on the distribution block.

A red pin indicates that lubrication between adjacent output and lubrication point is blocked.

If a red pin is visible perform the following:

STEP 1 Check where the lubrication is blocked.

STEP 2 Fix the problem.

STEP 3 Reset the pressure indicator by pressing the pin back in.

Exhaust system

Your vehicle may be equipped with one or more of the following components:

- catalytic exhaust converter.
- ECS purifier
- silencer

Catalytic exhaust converter

The converter consists of platinum coated pellets or honeycomb mesh. When heated by the engine exhaust gas the platinum acts to complete the combustion and oxidize carbon monoxide and hydro-carbons in the exhaust plume. Back pressure should be checked periodically to prevent carbon residue buildup.

ECS purifier

The purifier works like the catalytic converter, with the additional feature of providing particulate filtering. When starting a cold engine, black smoke or dark exhaust smoke will be visible. A ceramic honeycomb structure in the purifier traps the carbon soot and other particles. The smoke should disappear as the engine warms. This means that the catalytic purifier is effective and requires minimum maintenance.

Note Do not idle the engine for more than five minutes as this causes carbon buildup in the purifier. When carbon build-up is present dark smoke will appear during low-speed operating. If this happens, the system can be regenerated by running the engine at governed speed for five minutes (no load) until the exhaust becomes clear. The time between regeneration depends on use, condition of the engine and the grade of fuel used.

Engine drive belts

Check the tension of the drive belts by pressing with the thumb halfway between the pulleys. The belts should not deflect more than 13-19 mm (1/2"-3/4"). If any belt is loose or worn, report to maintenance for corrective action.

Fan hub grease fitting

If cooling fan hub is supplied with a grease fitting, apply one (1) hand pump of grease. Do not over grease. Shaft seals will be blown out by excessive greasing. Should the fan assembly need to be disassembled, the bearings will have to be packed in grease prior to reassembly. Use this fitting to fully lubricate the assembly.

Fire extinguisher

Ensure that a fire extinguisher is secured to the vehicle and that the indicator shows that it is serviceable.

Placement of the fire extinguisher may vary depending on customer specifications.

Fire suppression system

On vehicles equipped with this option it is recommended that the dry chemical level, gas cartridges and nozzles be checked every 100 hours.

Storage

Preparation for Storage

If the vehicle is to be in storage for 30 days or more, park it in a building if possible. If a building is not possible, park the vehicle in a dry, level area. Shift the transmission to NEUTRAL and engage the parking brake.

Clean the vehicle as well as possible.

Lubricate all pivot points.

Paint any areas where the paint has been damaged.

Drain, flush, and refill the engine cooling system. Replace the cooling system filter with pre-charge filter. Run the engine for 10 to 20 minutes to circulate the new coolant and to mix the additive.

Drain the fuel tank and put in diesel flushing oil. Run the engine as instructed by the manufacturer of the flushing oil.

Drain the flushing oil from the fuel tank.

Suspend a bag of Shell Oil Company VPI crystals in the fuel tank and install the fuel cap.

Change the engine oil and replace the engine oil filters.

Clean or replace the elements for the engine air filter.

Remove and clean the batteries. Put the batteries on a wood pallet and store in a cool dry place that will remain above freezing. Put each battery on a slow charge one time each month.

Install the articulation lock in the LOCKED position.

Make sure all controls are in NEUTRAL.

Put a coat of rust and corrosion preventive grease on each cylinder rod that is exposed.

Removal from Storage

Do not start the engine until steps 1 through 12 have been done.

STEP 1 Change the fuel filters.

STEP 2 Remove the VPI crystal bag from the fuel tank and fill the fuel tank with fresh fuel.

STEP 3 Check the condition of the engine drive belts, replace any belt that looks worn or cracked.

STEP 4 Check the oil level of the transmission.

STEP 5 Check the oil level of the hydraulic tank.

STEP 6 Check the level of the radiator and the coolant tank.

STEP 7 Check the oil level of each axle.

STEP 8 Lubricate all pivot points.

STEP 9 Use a petroleum base solvent and remove the grease from all cylinder rods and valve spools.

STEP10 Check the charge of each battery and install in the vehicle.

STEP11 Prime the Turbocharger oil lines with oil.

STEP12 Start the engine and run the engine at idle speed. Follow the engine and vehicle warm up procedure before you start working.

Trouble Shooting

The following table lists the most common problems that may be encountered by a Minetruck operator. If the problems cannot be solved using the corrective

actions listed in this table, notify maintenance personnel immediately.

Symptom	Probable Cause	Corrective Action
Engine fails to start	No electric current	Turn battery isolation switch and ignition switch all the way to ON. Tighten battery terminals. Check that circuit breakers or fuses are not tripped. Check wiring.
	Transmission speed lever not in neutral	Move shift lever to neutral.
	Fuel shutoff valve at tank closed	Open valve.
	Fuel tank empty	Fill up tank.
	Fuel system not primed adequately	Hand-prime fuel system with fuel pump at injection pump.
	Fuel filter blocked	Check lines and remove restriction. Check connections and tighten them if loose.
Engine difficult to turn over	Battery low	Fill electrolyte to proper level.
	Battery terminals oxidized or loose	Clean and tighten terminals.
	Wrong grade of motor oil	Replace oil with proper grade.
Engine runs unsteadily and power output low	Fuel system not primed.	Hand-prime with fuel pump.
	Insufficient fuel supply	Fill tank. Clean the fuel strainers. Replace filter. Tighten fuel lines.
	Dirt in the fuel	Drain tank and fuel lines, clean strainers, and replace filter, before re-filling with clean fuel.
	Wrong fuel	Drain tank and fill it with proper fuel.
Exhaust smokes badly	Too much oil in sump	Drain oil to proper level.
	Oil bath air cleaner oil level too high	Drain to proper level (if applicable).
	Air intake restricted	Check restriction indicators. Replace or clean air filter(s). Clear restriction.
Engine overheats	Radiator (or Air Cooler) cooling fins dirty	Clean fins.
	Low coolant in radiator	Check coolant level.
Engine oil pressure low	Low oil level	Check oil and fill to proper level.
	Oil leaks	Tighten connections.
	Converter overheating	Check Transmission oil level. Check that gears are engaging properly.
Voltmeter indicates discharge	Alternator drive belt slipping	Tighten belt.
	Alternator drive belt broken	Replace belts.
	Loose battery terminal connections	Check and tighten connections as required. Make sure connections are clean.
Parking Brake will not release	No accumulator pressure	Check gauge and charge system if necessary.
	No clutch pressure	Check clutch pressure gauge. Check transmission oil level.
	No current	Check brake system circuit breakers.

Symptom	Probable Cause	Corrective Action
Vehicle will not move	Engine not running	Start engine.
	Parking Brake engaged	Release Parking Brake.
	Forward (or Reverse) gear not selected	Select appropriate gear.
	Wheels chocked	Remove chocks and store in proper place.
Box will not dump	Pilot pressure too low	Check pilot pressure.
	Main Relief pressure too low	Check Main Relief pressure.
	Ore density to high for box volume	Reduce amount of load in box.

