TASK TRAINING OUTLINE

EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**
UNIT: **# 201/202**
DATE: **10/16/2018 (Revised)**

Purpose/Scope

The purpose of this document is to provide task training for the safe operation of the **Wirtgen 4200 Surface Miner**. This document addresses the health and safety aspects associated with training the new operator with the intent to understand the potential hazards associated with its use.

A. Safety Awareness:

1. Safety is your first and most important responsibility.
2. Follow all Bisti Fuels Company and MSHA safety rules.
3. Do not perform any work or operation of the machine unless you are authorized and qualified to do so through the task training process.
4. Only operate the Wirtgen 4200 to your level of task training i.e. Fully Certified, Maintenance Move, etc.
5. Persons operating, servicing, or repairing the machine must be fit for duty consistent with NAC policy
6. Always operate the machine with proper PPE including ear protection, eye protection and any other necessary protection
7. Know what safety devices this machine is equipped with and ensure each item is securely in place and operating properly before the machine is put into operation.
8. Ensure that all safety stickers/warning signs on the machine are intact and legible.
9. Know the operating characteristics and parameters of this machine.
10. Never modify or remove any part of the machine.
11. Never allow riders on the machine unless in the cab and positioned appropriately in the trainer/buddy seat.
12. Whenever you leave the machine follow the proper shut down procedures.
13. Secure your work zone of unauthorized personnel and equipment my maintaining at least 150’ of buffer to remain outside the line of fire.
14. Maintain three points of contact when getting on and off the machine.
15. Always use your seat belt when operating this machine.7. Never use the machine for tasks it is not designed for, damage to the machine and injury to the operator or both may result.

16. Know the working area and danger zones of your machine before you begin to cut coal or parting.
17. Ensure adequate illumination is in place in the work zone to comply with company and MSHA regulations
18. Follow proper equipment isolation rules and procedures as required
19. 30 CFR 77.807.2 states that booms and masts of equipment operated on the surface of a mine shall not be operated within 10' of an energized overhead powerline where the voltage of overhead lines is 69,000 volts. The minimum distances are listed as follows:

69000 – 114000 volts	12 feet minimum distance
115000 – 229000 volts	15 feet minimum distance
230000 – 344000 volts	20 feet minimum distance
345000 – 499000 volts	25 feet minimum distance

Inspect for leaks following Bisti Fuels Company level of severity plan for oil leaks listed below:

Level 1 Significant leak, obvious ignition source
MOP - Eliminate hazard or tag out immediately

Level 2 Noticeable leak, possible ignition source
MOP - Document in pre-shift inspection, monitor by operations, schedule repair and checked by maintenance during the shift.

Level 3 Minor leak or accumulation, no ignition source.
MOP - Document in pre-shift inspection, monitor by operations, place on PM inspection list / checked by maintenance during the shift.

TASK TRAINING OUTLINE

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UNIT: **# 201/202**

DATE: **10/16/2018 (Revised)**

Basic Machine Overview

Basic design

Frame
Rigid welded design with integrated tanks for fuel and water.

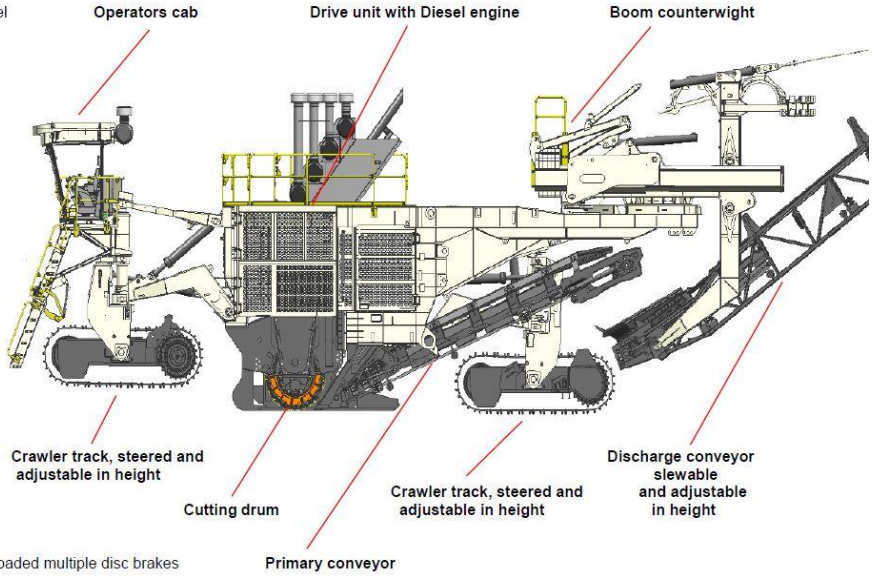
Crawler unit suspension
The four crawler tracks are mounted free-floating on parallelogram-type suspensions. The tracks are fitted with double grouser track shoes.

Cutting depth control
The height (cutting depth) is adjusted via hydraulic cylinders. The rear crawler suspensions are controlled via an automatic cutting control unit
(LEVEL PRO)

Travel drive
Each crawler track unit is driven by planetary gearing with hydraulic motor. Both, the front and rear travel drive motors are fed by a hydraulic variable displacement pump each. The advance drive speed can be infinitely adjusted from zero to maximum in both travel and operating gear.

Brake system

Operating via a closed-loop hydrostatic system.
Parking brake for each crawler unit with spring loaded multiple disc brakes



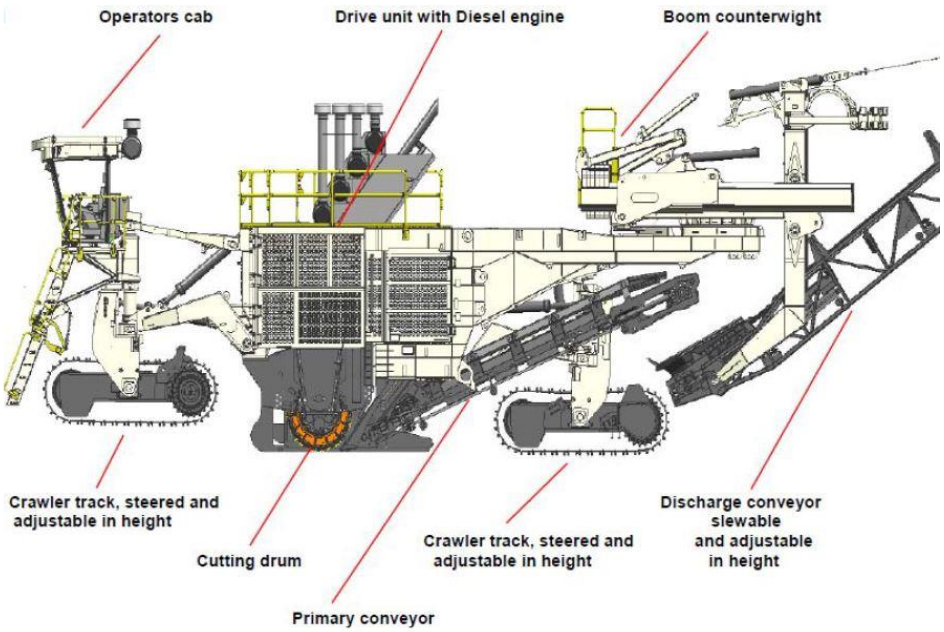
Basic design

Scraper blade
The drum chamberis sealed by a hydraulical actuated scraper blade behind the cutting drum,thus ensuring a clean cutting surface.

Steering
The surface miner is steered via an all-crawler steering.

Water spraying system
The Water spraying system largely prevents the generation of dust while cutting material and reduces the degree of wear on the cutting tools due to the cooling effect. The spray nozzles can easily be removed for cleaning. Spray nozzles are additionally installed for the loading conveyors, thus preventing the generation of dust while loading material.

Conveyor system
The conveyor system comprises a wide primary conveyor wich picks up the cutn and comminuted material at the cutting drum, as well as a discharge conveyor to load the material onto trucks. The discharge conveyor can be adjusted in height and slewed to both sides.
The conveying speed can be infintely varied.



TASK TRAINING OUTLINE	
EQUIPMENT/TASK:	**Wirtgen Surface Miner 4200**
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B. Pre-Operation Inspection/Cold Engine Start

Pre and Post shift inspections must be completed as part of the Operators responsibility. Additionally, any time during the shift, when the operator dismounts the machine a visual walk around should be completed to visually inspect for leaks, lose or missing parts, damaged parts, or parts out of adjustment.

The following outlines the Operators pre-shift or walk around Inspection:

Check Emergency Stop Buttons

TASK TRAINING OUTLINE

EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**

UNIT: **# 201/202**

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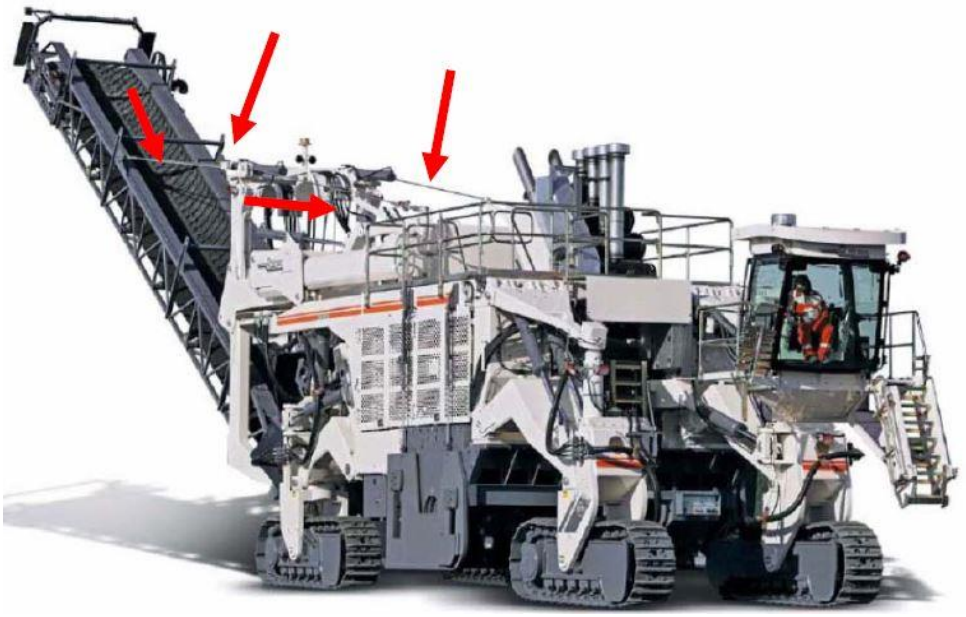
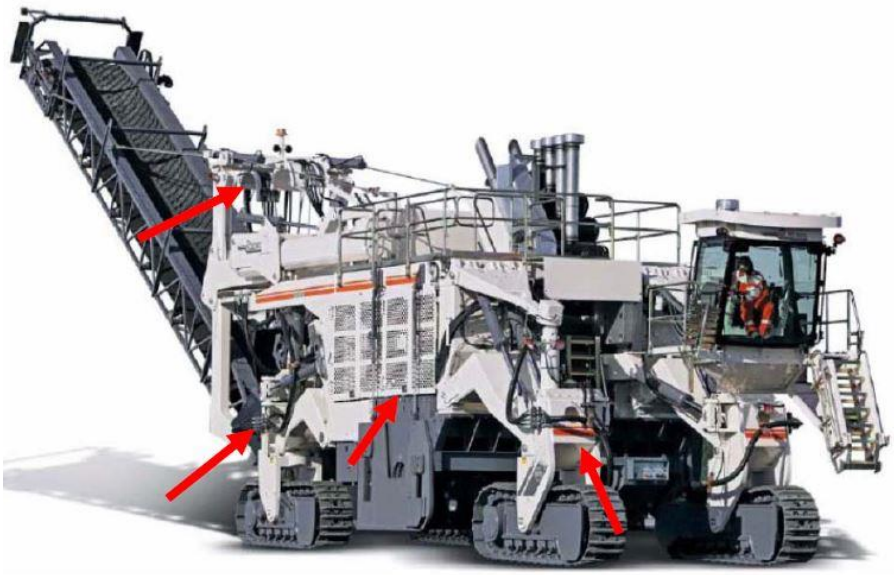
Check Wire Ropes



Check for Hydraulic Leaks



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Check for Hydraulic Leaks, Cont.

Check for Oil Leaks at Tracks

TASK TRAINING OUTLINE

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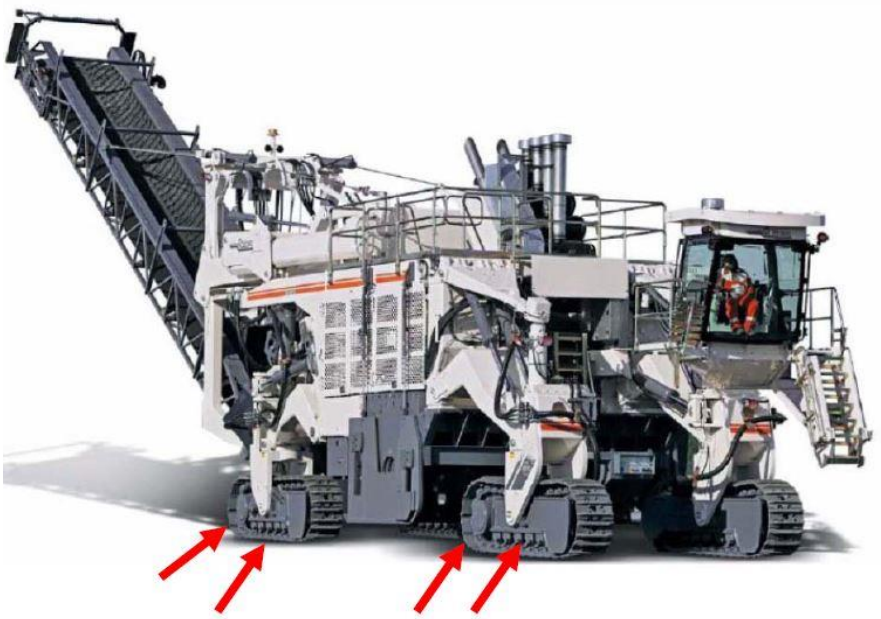
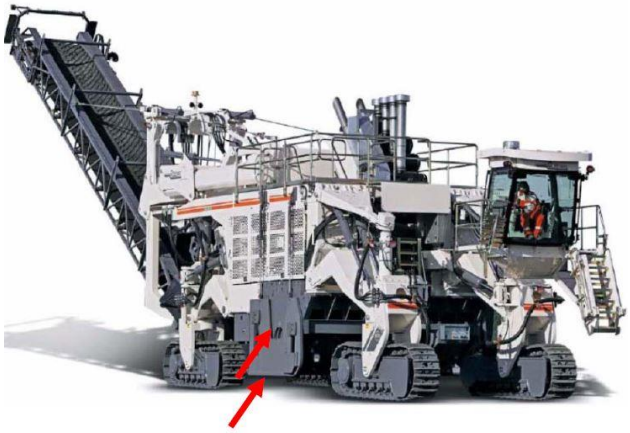


Check for Oil Leaks at the Milling Drum



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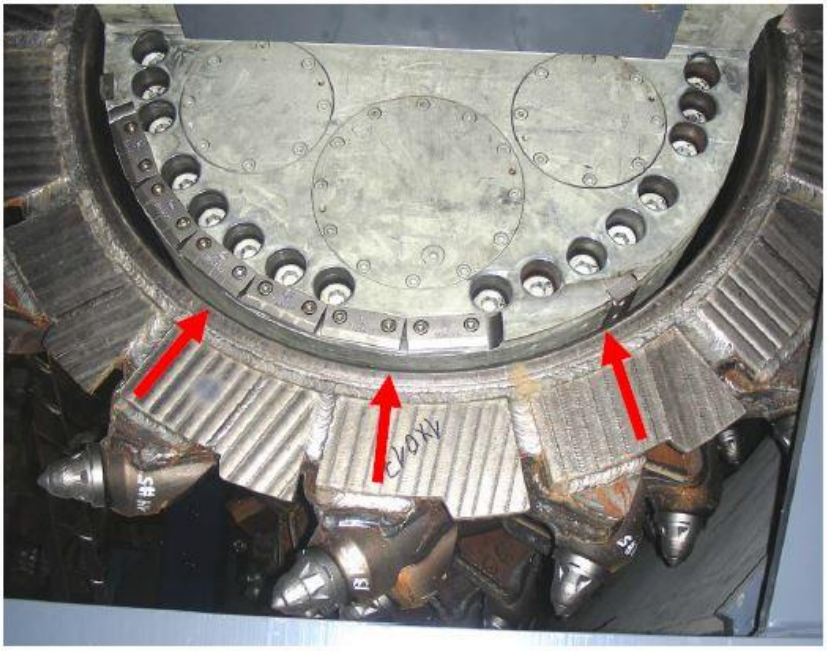
Check for Oil Leaks at the Milling Drum

Left side of milling drum



Right side of milling drum

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EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**
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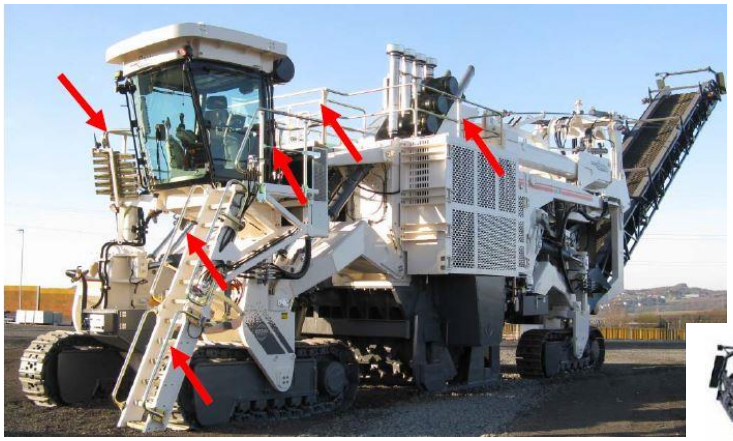
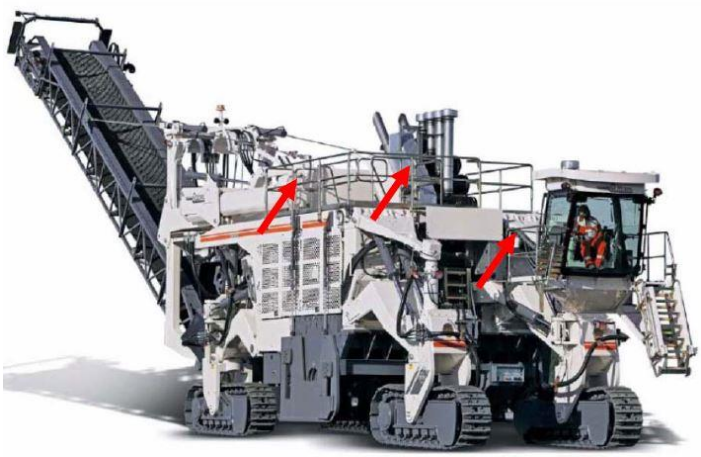
Check Stairs

Check Rails on Machine





TASK TRAINING OUTLINE

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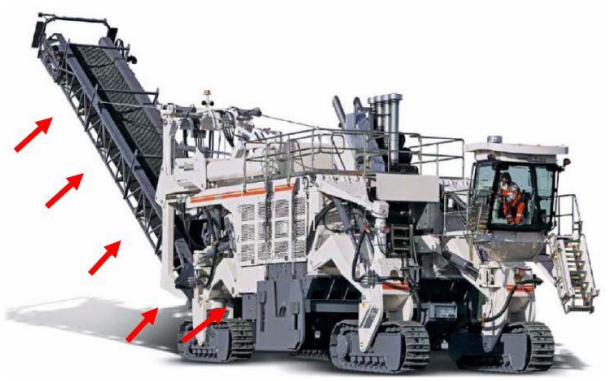
Check Conveyor Belt



Check Cutting Tools and Tool Holder (Drum)

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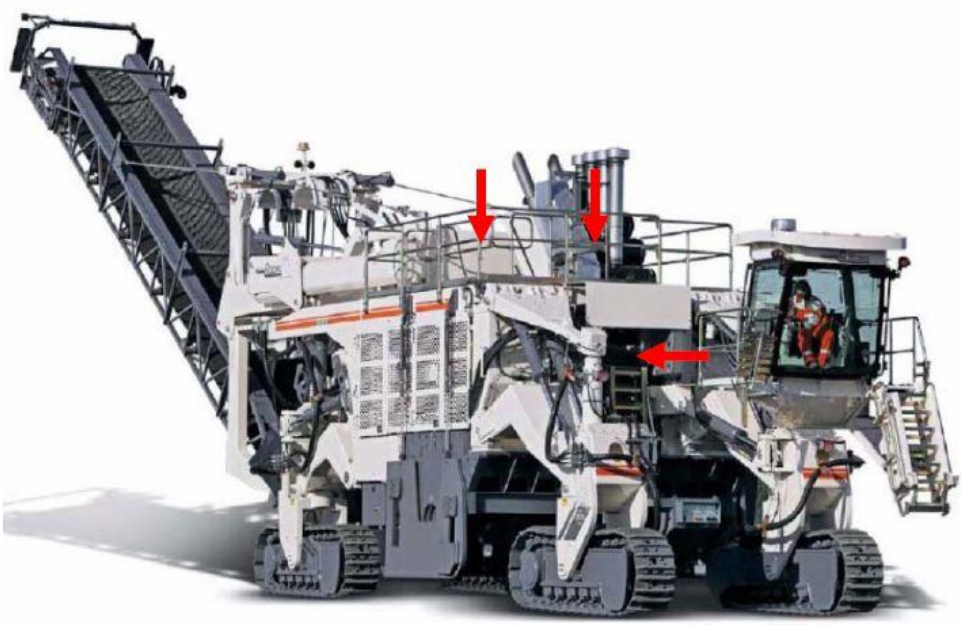
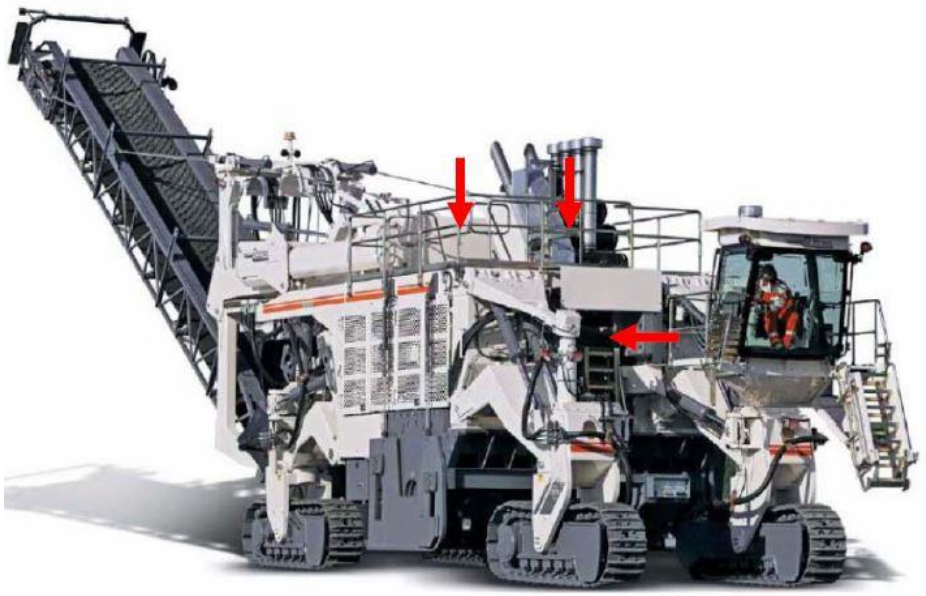
Check for Oil Leaks in the Engine Compartment



Check Coolant and Oil Levels at the Engine Compartment



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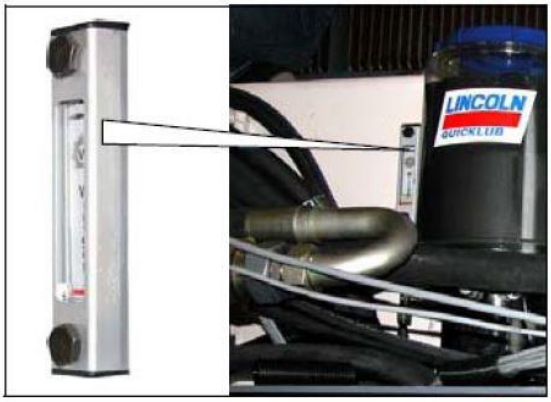
Fluid Level Site Glasses

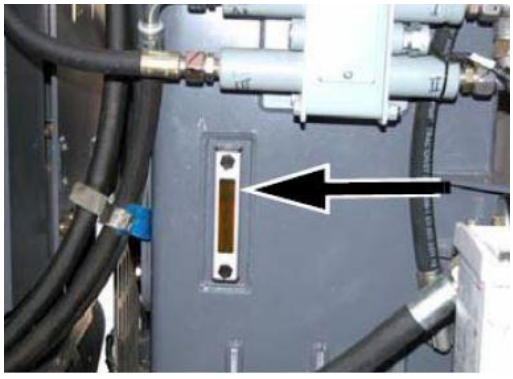


Checking Hydraulic Oil Level

- Check the oil level prior to starting the shift
- The oil level must reach the upper edge of the sight-glass

Checking Engine Oil Level

- Extract the dipstick; the oil level must be between MIN and MAX, otherwise the lubrication system must be checked
- Check oil level in oil reservoir: Oil level inside reservoir must be higher than the sight-glass



TASK TRAINING OUTLINE

EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**
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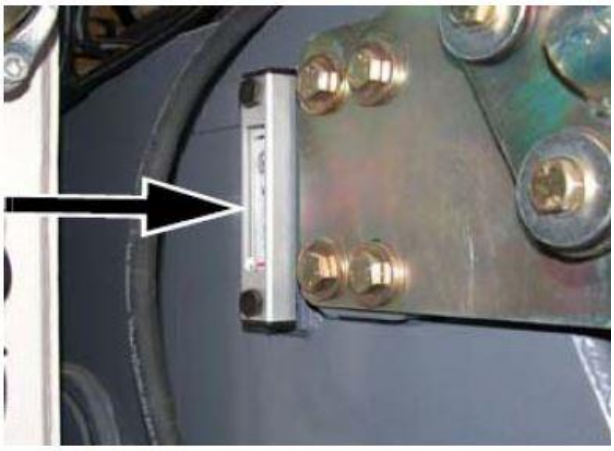
Hydraulic Oil/Pump Splitter Gearbox

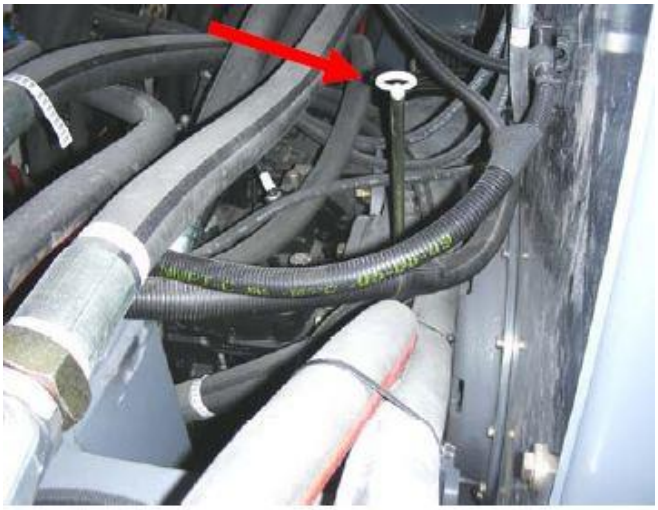
Checking Hydraulic Oil Level

- Check level at start of shift
- Sight-glass must be at least half full, otherwise add fluid



Checking Gear Oil Level

- Check level at start of shift
- Check dip stick
- Must be between upper and lower markers



TASK TRAINING OUTLINE

EQUIPMENT/TASK: Wirtgen Surface Miner 4200
UNIT: # 201/202
DATE: 10/16/2018 (Revised)

Check Water Cooler for Contamination

Check Hydraulic Oil Coolers for Contamination

TASK TRAINING OUTLINE

EQUIPMENT/TASK: Wirtgen Surface Miner 4200
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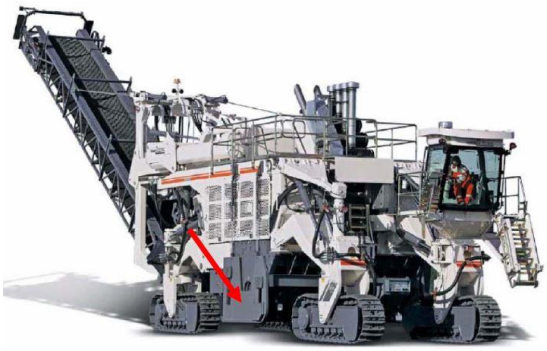
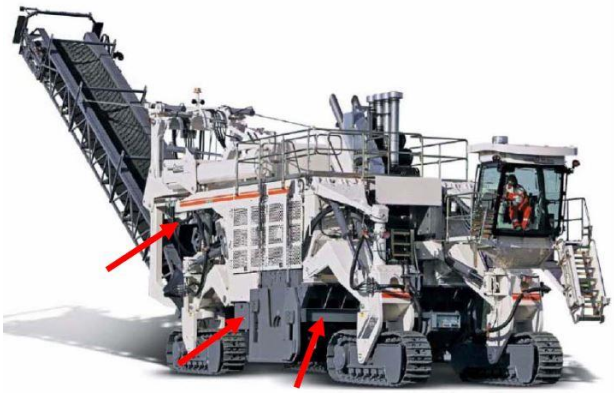
DATE: 10/16/2018 (Revised)

Check the Side Plates



Check Water System

(Special consideration during cold weather)



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The following is the Pre-Operational Inspection Checklist to be utilized with the Wirtgen SM 4200

NOTE: This will serve as the White Card and will be completed at the beginning of every shift

Wirtgen 2705-201 Shift Inspection

Date:	Hours:
Shift:	Supervisor:

Pre-op / Running Check List		OK	Problem	Required By
Seatbelt				
Propel Alarm				
Horn				
Park Brake				
Steering				
Fire Extinguisher (Tag, Seal, Caps, etc.)				
Lights				
Tracks				
Oil/Grease Accumulation				
Glass & Wipers				
Instrument Panel & Gauges				
Cab Conditin (Rops, Loose Materials, etc.)				
Fluid Level (Engine Oil, Colant, Hydraulics)				
Handrails & Ladders				
Other				
Chassis / Safety devices	*Check functions before starting work			
Operators Station	*Check dust pre-cleaner; clean if needed			
	*Check A/C condenser			
	*Check A/C evaporator			
Milling Drum	*Check cutting tools (Bits) frequently			
	**Replacements available at W/H if needed			
	*Check tool holders			
Turbo Coupling	*Check oil level			
Engine / Motor Group	*Check fuel level frequently (Sightglass)			
	*Check Engine oil level (Dipstick by oil filters)			
	*Drain water from Fuel water seperator			
	*Check air filters (Indicators)			
	*Inspect Engine coolers			
	*Check coolant level; add if needed			
Hydraulic Oil	*Check hydraulic oil tank level			
	*Check hydraulic pump drive oil level			
	*Inspect hydraulic oil cooler fins			
Advance Drive	*Inspect track pads			
	*Inspect rollers			
Primary Conveyor	*Inspect rollers and lower side of the belt			
Conveyor Units	*Inspect support rollers			
Discharge Conveyor	*Inspect rollers and lower side of the belt			
	*Inspect support rollers			
Dust Suppression System	*Check water level frequently			
	*Check and clean water filter			
	*Check spray nozzles			
Lube	*Check and fill lube tank frequently			

Comments:	
Operator:	Supervisor:

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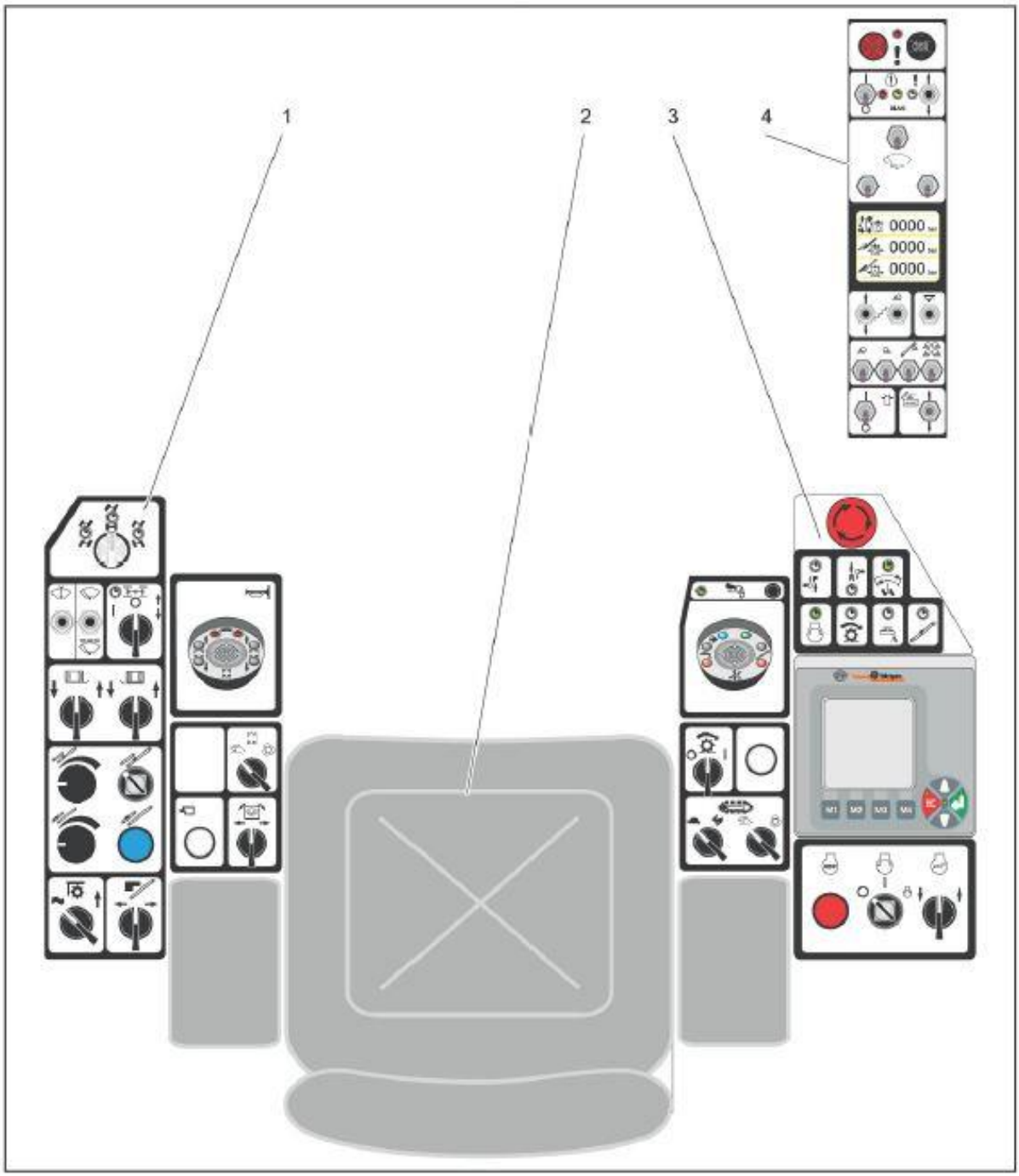
Overview of the Control Panels in the Operators Cab



[1]	Control panels on the operator's seat left	[3]	Control panels on the operator's seat right
[2]	Operator's seat	[4]	Control panel on the cabin pillar right

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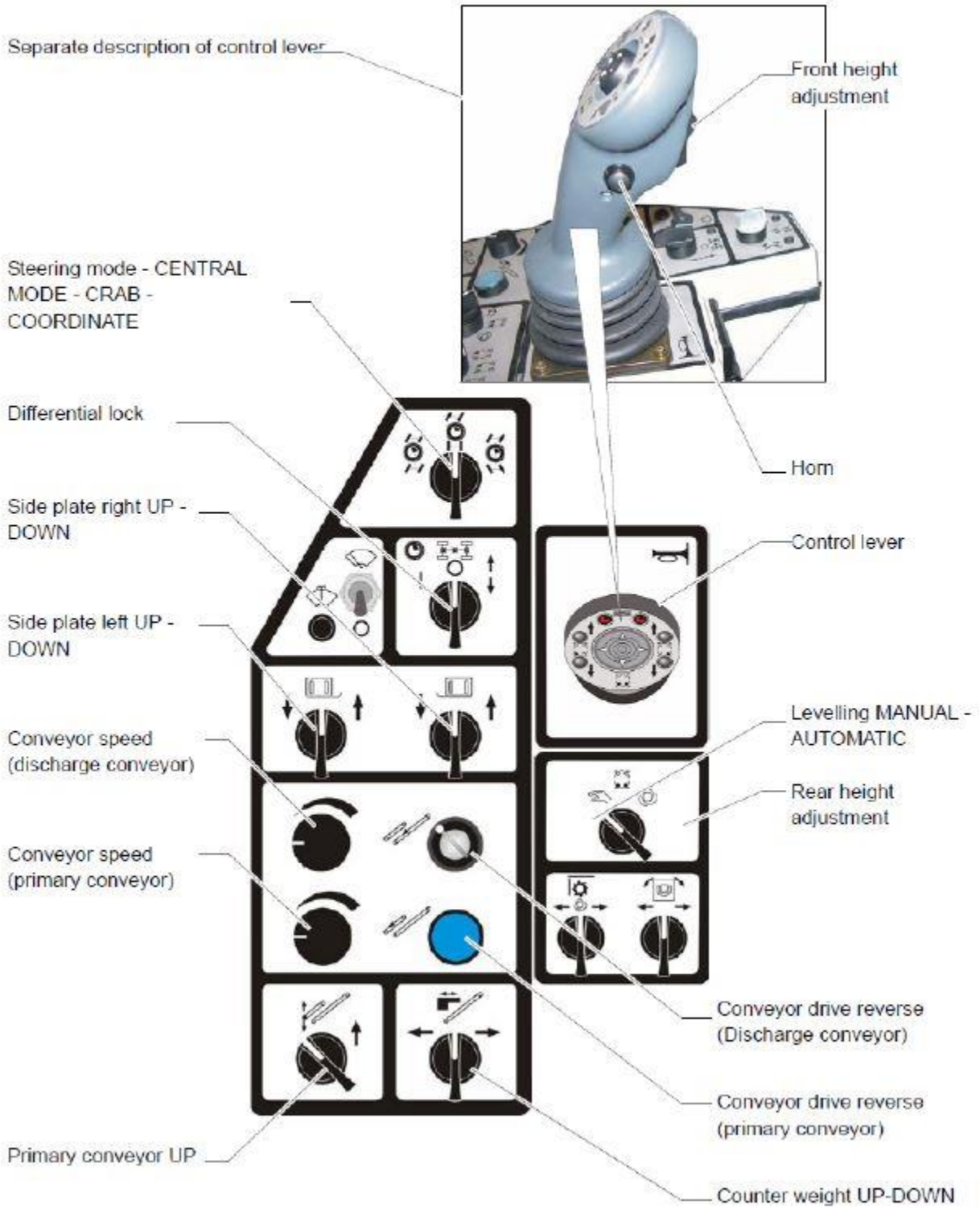
Left hand control elements



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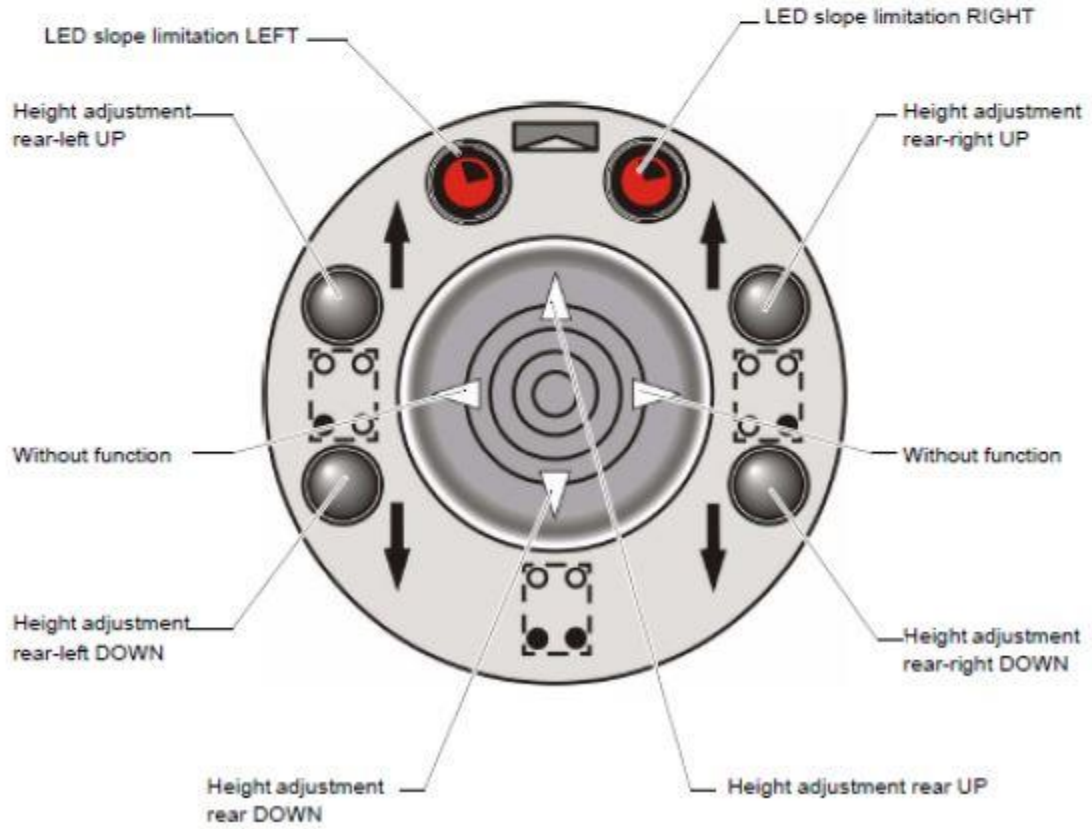
Control lever left



TASK TRAINING OUTLINE

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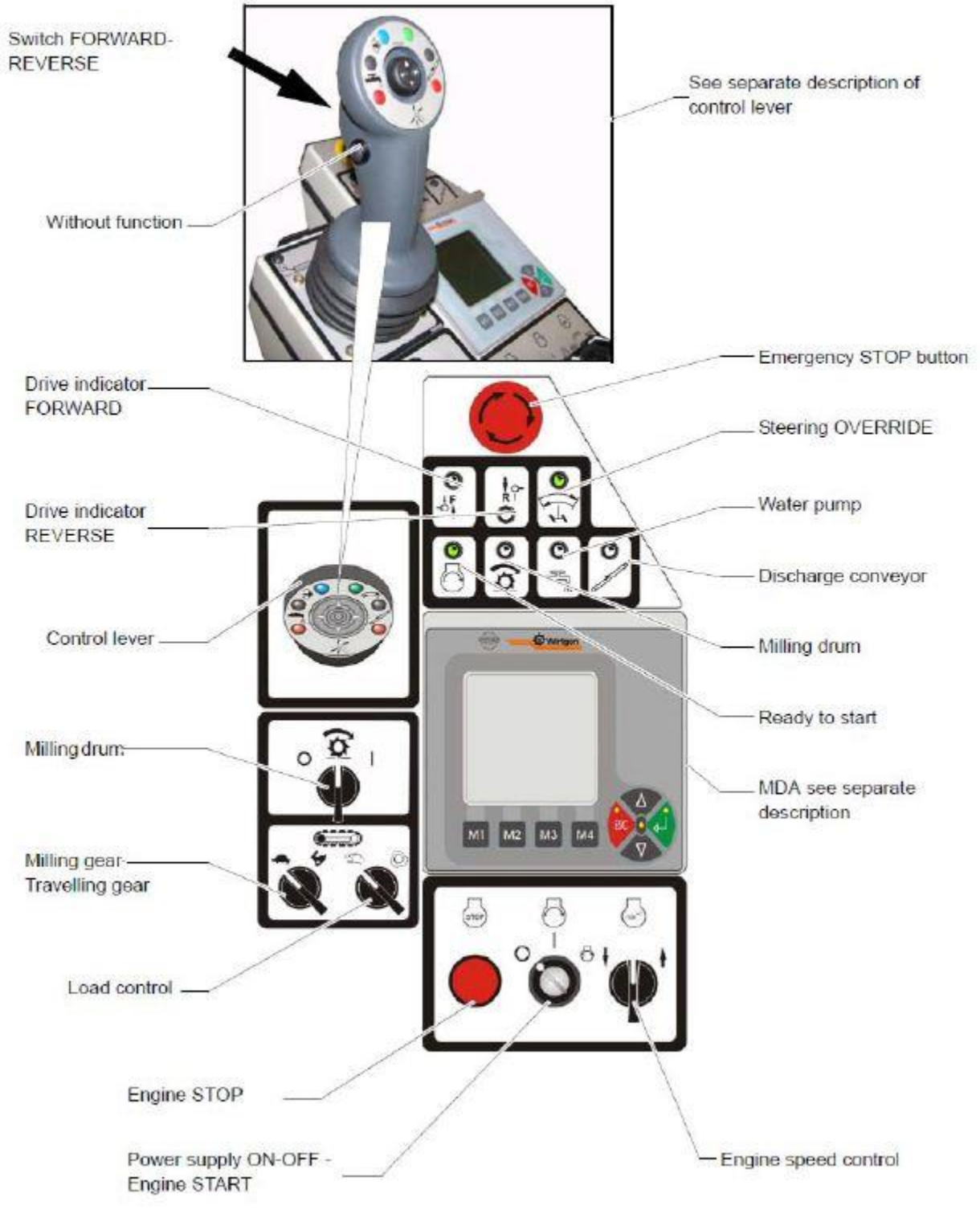
Right hand control elements



TASK TRAINING OUTLINE

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UNIT: **# 201/202**

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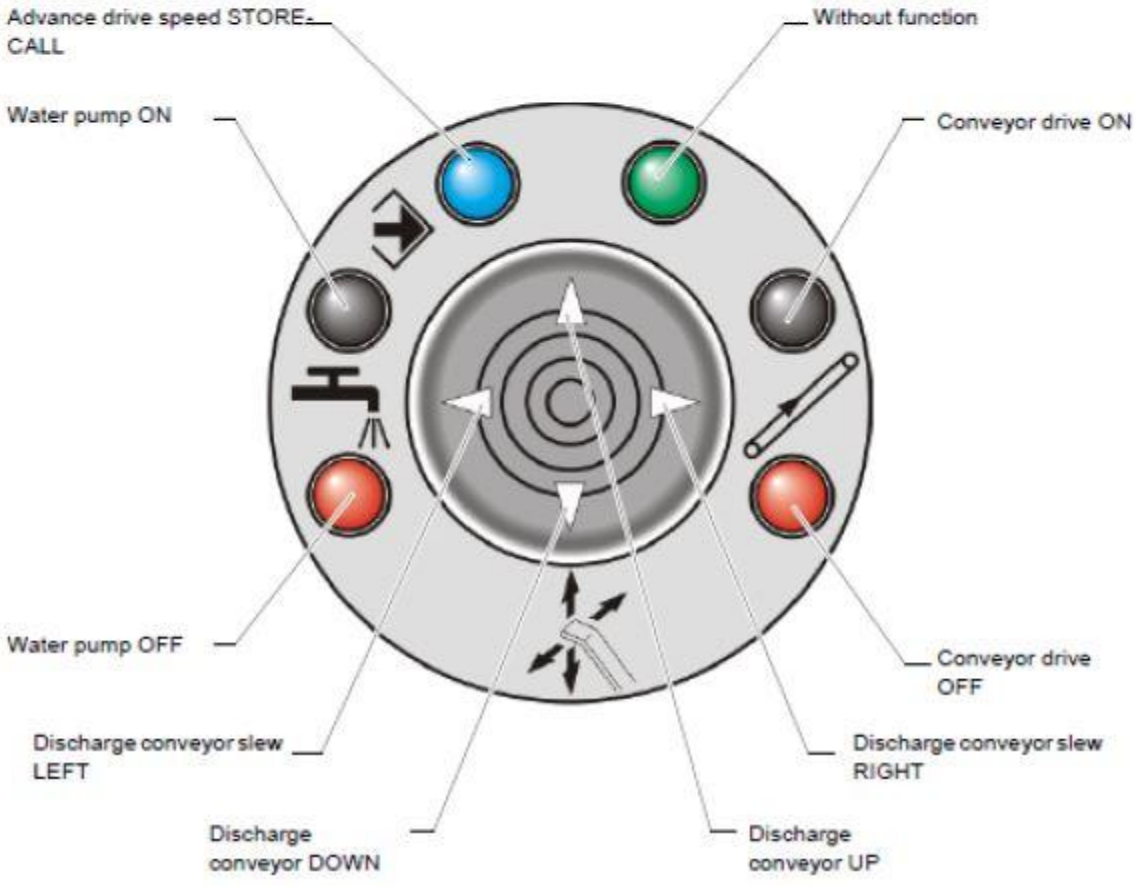
Control lever right



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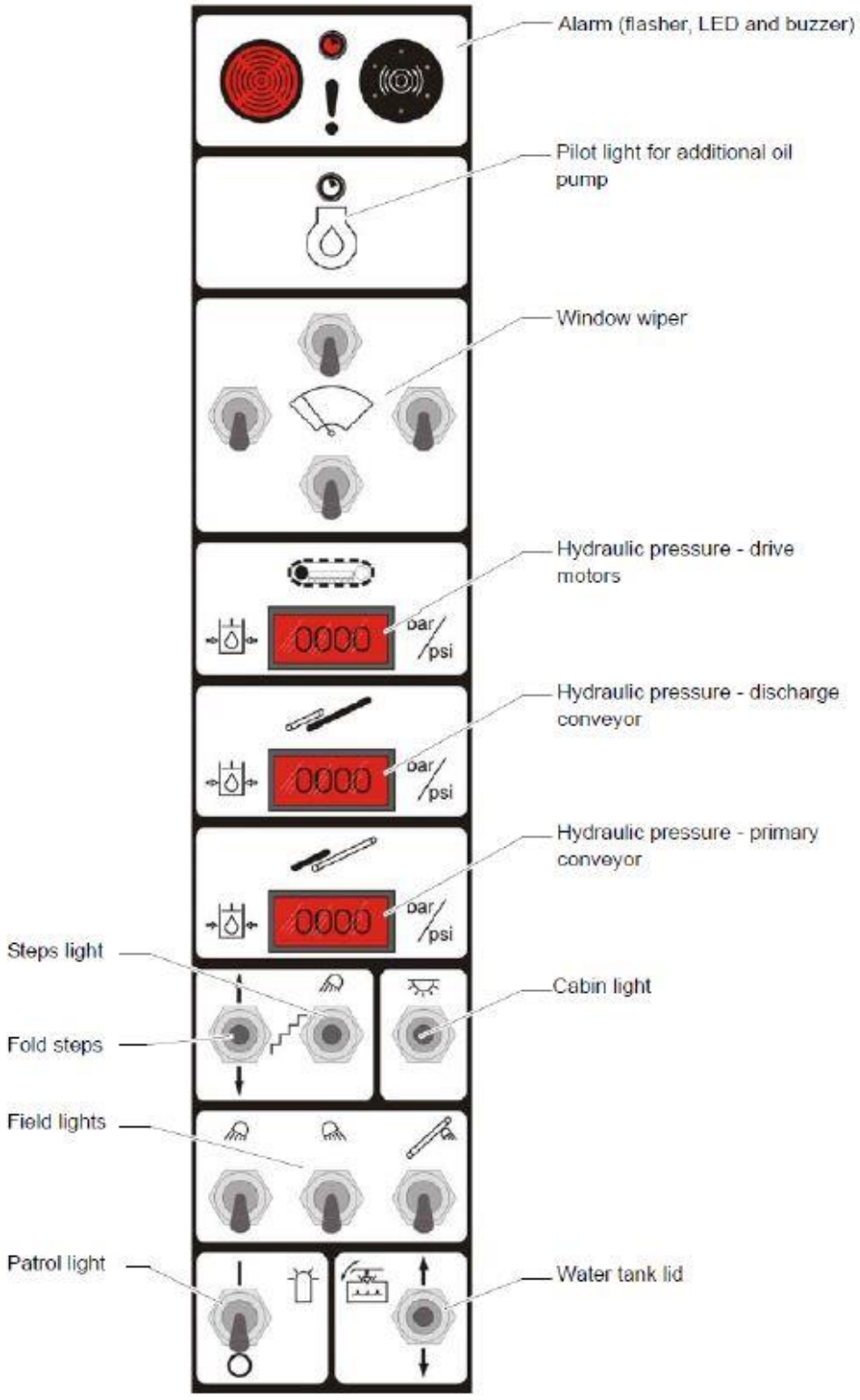
Control panel up right



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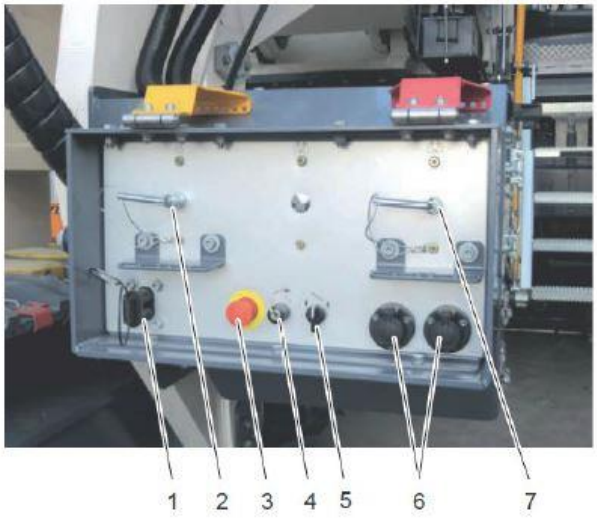
Other Control Panel

Control panel battery main switch

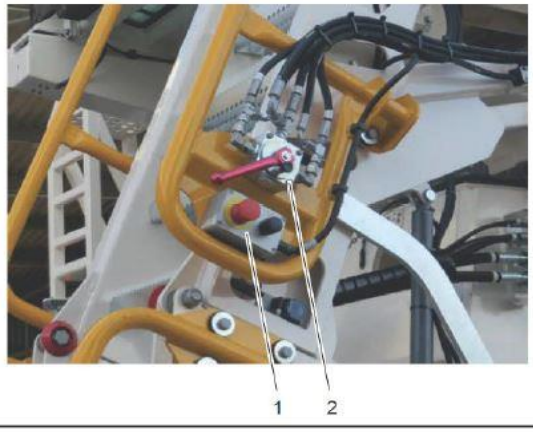


[1]	Socket for charging the starter battery	[5]	RAISE / LOWER step
[2]	Battery main switch "I"	[6]	Sockets 24 V
[3]	EMERGENCY STOP switch	[7]	Battery main switch "II"
[4]	Key switch - release pick extractor and milling drum rotation device ON / OFF		

Battery main switch "I" - enable for engine start.

Battery main switch "II" - This switch disconnects/connects the starter battery from/to the vehicle electrical system.

Step control panel



[1]	EMERGENCY STOP switch and step lighting ON / OFF	[2]	Four-way ball valve

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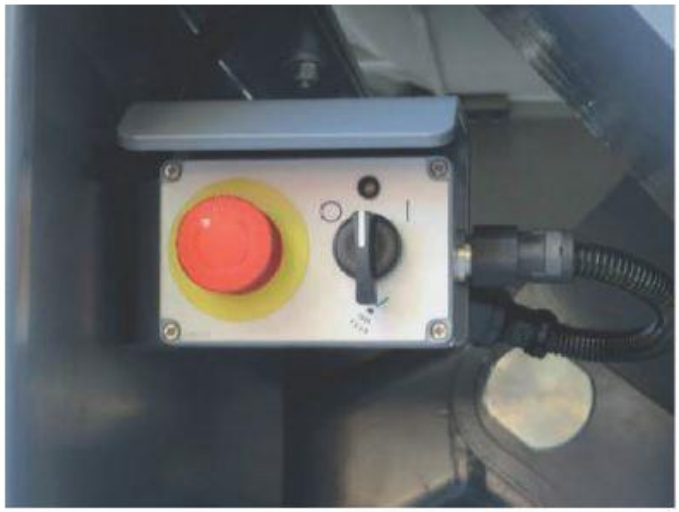
Control panel milling drum rotation device

The milling drum rotation device control panel is equipped with a magnet and can be moved accordingly.

Water system control panel



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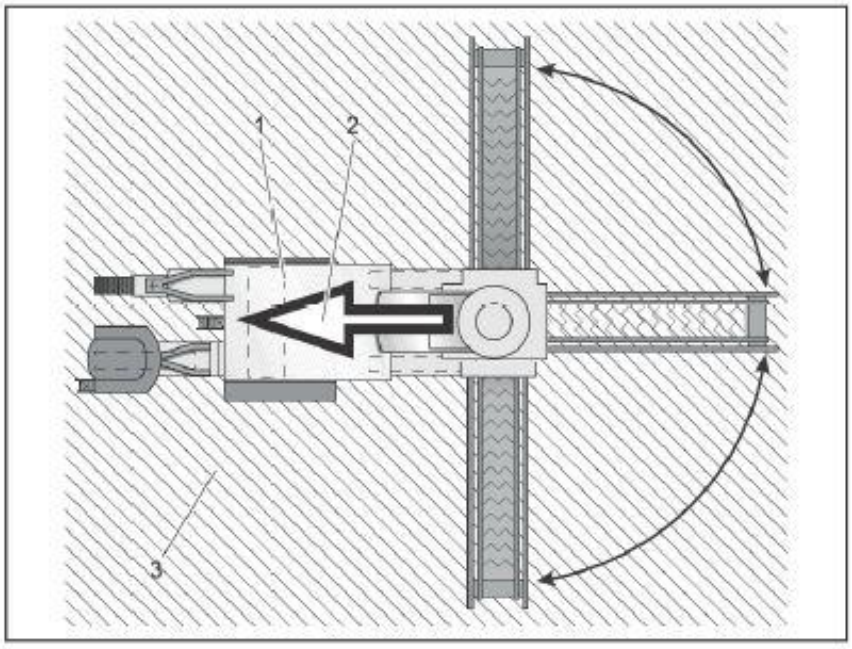
Danger Zones

- No additional operator is required or allowed on the ground during on-site operation
- The operator must stop on-site operations if anyone approaches the machine within a 150 foot radius (defined as the Danger Zone)
- Entry into the Danger Zone is only allowed for maintenance and cleanup work (such as with the assigned motor grader or truck being loaded)



[1] Top view of the machine
[2] Direction of travel arrow
[3] Danger area (hatched zone)

- If maintenance requires the side plates to be raised and the cutting drum observed in operation, the maintenance personnel are required to have a hand-held radio and use postiive communication during this time
- When the machine turns and the side plates are genreally in the placed in the “up or raised position” all personel shall remain outside the defined danger zone of 150 feet.
- Other operational situations exposing the cutting drum are addressed by remaining outside the danger zone of 150’.
- All operators are trained in the safe use and application of the side plates including switch utilization, location and operational situations.
- If any situation arises that is deemed unsafe by the machine operator the machine will be shut down immediately and the safety issue addressed or corrected.

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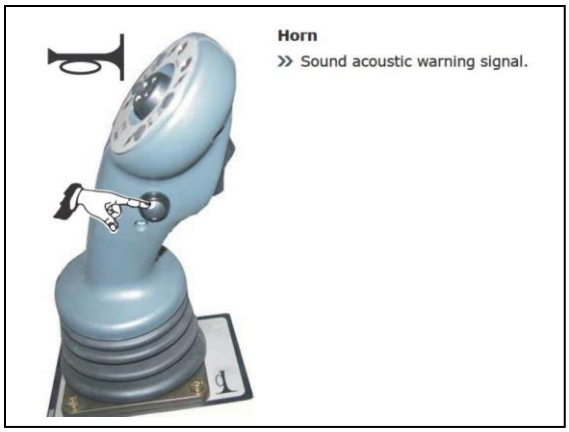
UNIT: **# 201/202**

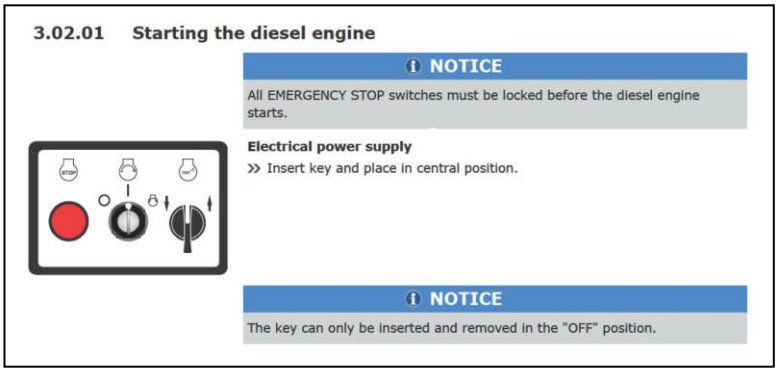
DATE: **10/16/2018 (Revised)**

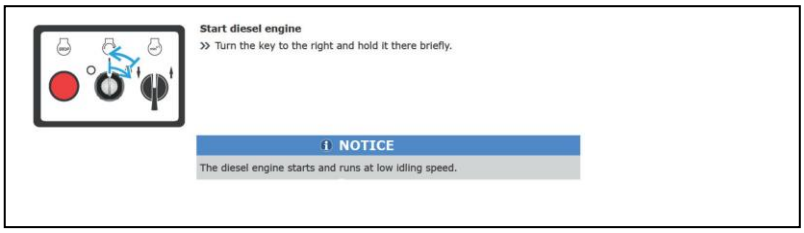
Start-Up of the Engine

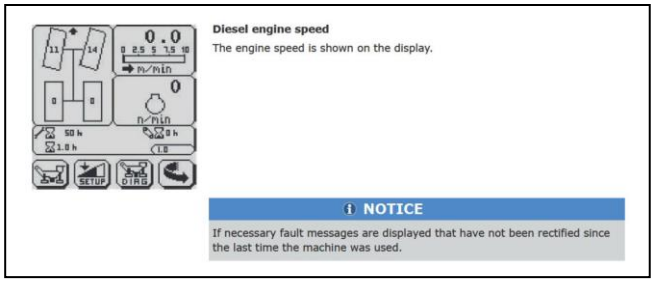
General Start-Up Instructions

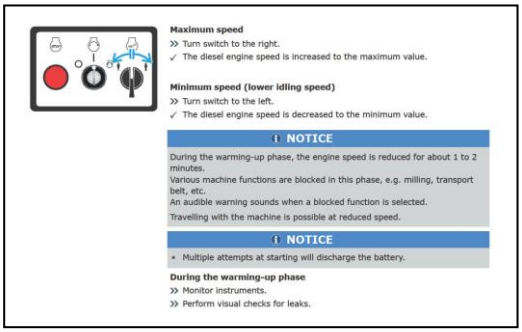
- Take a seat in the cab
- Close the cab door
- Fold down armrest
- Put on safety seat belt
- Apply horn signal
- Start diesel engine
- Increase diesel engine speed
- Raise machine











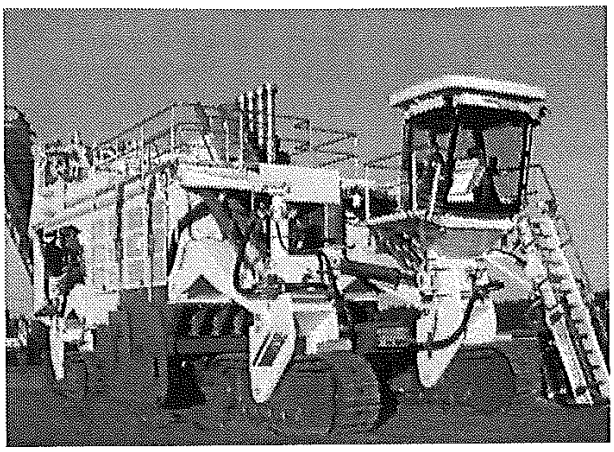
TASK TRAINING OUTLINE

EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**
UNIT: **# 201/202**
DATE: **10/16/2018 (Revised)**

Operations On Board the Machine

Aboard the machine

- The areas of the machine equipped with gangways and railings must not be accessed while the machine is operating.
- Passengers must not be carried on the machine.
- The operator must not leave the cabin while the machine is operating.
- Certain areas of the machine must be accessed during service and maintenance work that are not secured by railings or other safety devices against falling.
  Suitable safety precautions must be decided upon and implemented on site, such as scaffolding around the machine or the use of personal safety equipment.



Emergency Stop

EMERGENCY STOP button

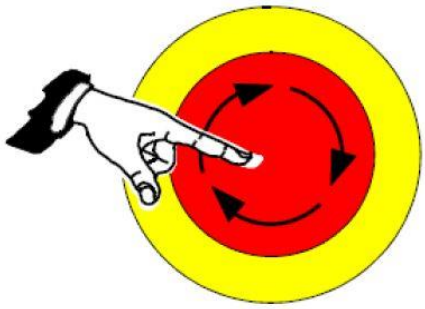
Test:

Step 1
Disengage all EMERGENCY STOP buttons on the machine.

Step 2
Start the engine and run it at idling speed.

Step 3
Press one of the emergency STOP buttons.
The engine must stop immediately.

Step 4
Repeat steps 1, 2 and 3 with all other emergency STOP buttons.



NOTICE

If the machine is stopped using the EMERGENCY STOP switch,

- Mechanical components are exposed to increased wear.
- Electrical and hydraulic components may be damaged.
- Only press EMERGENCY STOP switch in case of danger.
- Do not use EMERGENCY STOP switch to stop the machine in normal use.

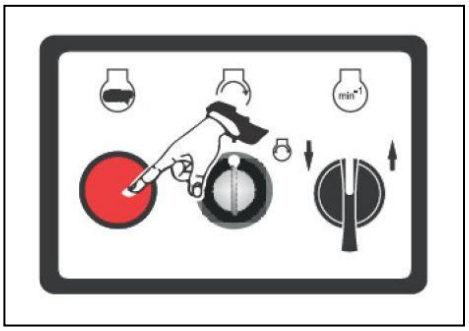
TASK TRAINING OUTLINE

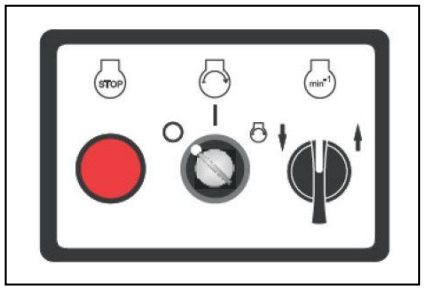
EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**
UNIT: **# 201/202**
DATE: **10/16/2018 (Revised)**

Engine Stop

General Shut-Down Instructions

- Raise machine
- Switch off milling drum drive
- Switch off sprinkler unit
- Drive machine to parking position
- Switch off diesel engine after cool down (3 to 5 minutes at idling speed)
- Press Stop Button
- Set Electrical Power Supply to OFF
- Apply appropriate horn signal
- Secure items in cab
- Leave cab, close door





Fire Suppression System

Fire Suppression System Overview

- The Wirtgen Surface Miner is equipped with a A-101/LVS Twin-Agent Suppression System
- The system is a Checkfire 210 detection and actuation system designed to be either initiated by the operator or detecting circuits identifying an event or fire conditions and activating the release circuit
- The system utilizes electronic activation through the power provide by the machine or an internal system battery to activate the expellant gas cartridge of the fire suppression system
-
- Twin Agent System (both systems discharge simultaneously when actuated)

- **ANSUL A101**: Dry Chemical, designed to flood and knock down specific high hazard areas, Orange Caps on nozzles
- **LVS** or **Liquid Vehicle System:** Wet Agent system, superior cooling of superheated surfaces, blankets surfaces and fuel to cut off oxygen, Blue Caps on nozzles

Locations of Actuators

Operators Cab on Left Side

Control Box

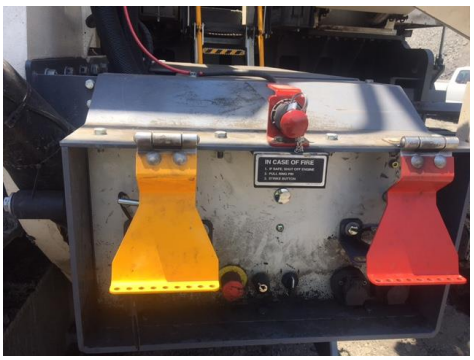
POWER

System Function

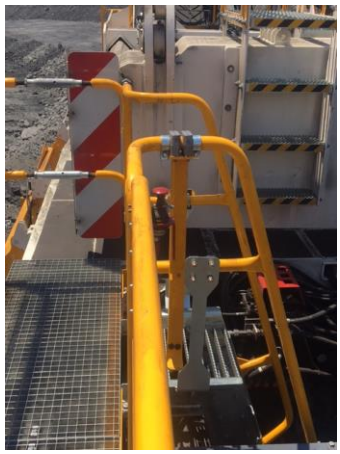
- Solid Green Light: system operational with equipment power
- Blinking Green Light: system operational but with only battery power
- Blinking Yellow Light: Master Switch is off: turn on: solid green light comes on
- If the power lights is NOT on: SHUT DOWN and report to supervisor there is a system fault

NOTE: If operating machine and power light blinks green or yellow-report to supervisor immediately; Fire Suppression System is still operational but there is some kind of fault

Lock Out/Isolation Box



Hand Rail on Top Deck



TASK TRAINING OUTLINE	
EQUIPMENT/TASK:	**Wirtgen Surface Miner 4200**
UNIT:	**# 201/202**
DATE:	**10/16/2018 (Revised)**

Deployment/Activation

- Push RED button on Control Box (peel back safety shield)
- Push plunger located at several point on equipment (pull pin first)
- System activated by a fire
    - Red Button is lit with a chirping audible alarm
    - After activation Red Button is lit, operator can press DELAY for a 10 second delay until system suppressant is released
    - After this 10 second delay, the engine is automatically shut down and the suppressant released
    - After 20 seconds, the automatic engine shut down feature will be engaged
- Be certain all caps (blue and orange) are on nozzles securely (replace if needed)
- Ensure power is to the control panel in the operator's cab

Additional Fire Emergency Information

1. BASIC FIRE
    a) SHUT DOWN ENGINE
    b) TURN OFF MASTER SWITCH (IF POSSIBLE)
    c) ACTIVATE FIRE SUPPRESSION SYSTEM
    d) ANNOUNCE "Emergency" OVER RADIO
    e) EVALUATE SITUATION
        1) DISCHARGE HAND HELD EXTINGUISHERS IF POSSIBLE
        2) MOVE A SAFE DISTANCE AWAY AND WAIT FOR ASSISTANCE
2. HYDRAULIC FIRES
    a) DO NOT APPROACH A HYDRAULIC FIRE ALONE
    b) UNDER NORMAL OPERATING CONDITIONS, HYDRAULIC SYSTEM WILL BE UNDER PRESSURE
    c) WHEN FIRE IS ON or NEAR HYDRAULIC RESERVOIR, GET A SAFE DISTANCE AWAY AND WAIT FOR WATER TRUCK.
3. FUEL FIRES
    a) DO NOT APPROACH FUEL FIRES ALONE
    b) SHUTTING DOWN ENGINE SHOULD RELIEVE FUEL SYSTEM PRESSURE.
    c) WHEN FIRE IS ON or NEAR FUEL RESERVOIR, GET A SAFE DISTANCE AWAY AND WAIT FOR WATER TRUCK.

TASK TRAINING OUTLINE

EQUIPMENT/TASK: **Wirtgen Surface Miner 4200**

UNIT: **# 201/202**

DATE: **10/16/2018 (Revised)**

!! IN ANY FIRE, PROTECT YOURSELF. NO MACHINE IS WORTH YOUR LIFE!!

EMERGENCY FIRE FIGHTING PROCEEDURES

OPERATOR:

1. Evaluate the scene
2. Take command, stay calm, ……. DO NOT RISK PERSONAL INJURY
3. Activate Emergency Procedures

EMERGENCY PROCEEDURES

1. Shut-down engine
2. Activate fire suppression system.
3. Call for Radio Silence on the channel of operations, usually channel 1.
   Say, "I HAVE AN EMERGENCY."
4. State nature and location of fire.
5. Call for Water Truck
6. Clear the area of equipment or people
7. Exit the cab - use hand held extinguishers if possible – DO NOT RISK PERSONAL INJURY
8. Evacuate the machine and wait for assistance – DO NOT RUSH INTO AN INCLOSED AREA IF FILLED WITH SMOKE.

The fire suppression system could have smothered the fire – opening a door could allow oxygen to reenter the house area and the flames to reignite.

DO NOT ENTER AN ENCLOSED AREA FILLED WITH SMOKE. The fire department will have a self-contained breathing apparatus and other personal protective equipment necessary to enter a smoke filled area.

A. Parking and Shut Down Procedures

1. Park on smooth hard surface
2. Allow engine cool down for minimum of 3 minutes (turbo cool down)
3. Follow all procedures in shutting down cutting drum, conveyors, etc
4. Turn key to "Off" position
5. Set "Park Brake" switch
6. Exit cab using three points of contact

TASK TRAINING OUTLINE

EQUIPMENT/TASK:	**Wirtgen Surface Miner 4200**
UNIT:	**# 201/202**
DATE:	**10/16/2018 (Revised)**

General Field Operations Process

Appendix 1 highlights the current Operations plan at Navajo Mine showing the general operating sequence using the Wirtgen SM 4200 and the Kress Coal Haulers when recovering coal.

"This task training outline is provided solely for training purposes and should not be considered a substitute for the recommendations of the equipment manufacturer or MSHA requirements."

If any additional information is required, refer to the OEM Operation and Maintenance Manual in the equipment or see the Training Department.

Other Information Discussed:

BISTI FUELS COMPANY
NAVAJO MINE
Certificate of Task Training
ID#29-00097

Surface Coal

This certificate is required under Public Law 91-173 as amended by Public Law 95-164. Failure to comply may result in penalties and other sanctions as provided by Sections 108 and 110, Public Law 91-173 as amended by Public Law 95-164. Based on OMB Number 1219-0009.

Employee Name:_____ **Employee Number**:_____

Task or Equipment Involved: **Wirtgen 4200 Surface Miner** **Equipment Number**: **201/202**

A task training checklist has been completed, reviewed, and approved	Trainer's Initials	
	Employee's Initials	

Recertification only (please circle, if applicable) Yes No

	Record of Training	Date	Trainer's Initials	Employee's Initials
1)	Instruction in safe operation of task or equipment			
2)	Operation in non-production situation - under supervision, certified			
3)	Operation in production situation – under supervision, certified			
4)	Certified or full operation (Supervisor authorization)			
5)	Modification or update of equipment (Additional training on equipment)			

If not yet certified for full operation, indicate areas where certified or not certified

Certified	Date	Supervisor	Employee	Not Certified

False certification is punishable under Sections 110(a) and (f) of the Federal Mine Safety & Health Act (P.L. 91-173 as amended by P.L. 95-164)

I certify that the above training has been completed.

Employee Number _____

_____ Date _____

___(signature of trainer)

I certify that I have received the above training.

Employee Number _____

_____ Date _____

(signature of person trained)

I certify that the above training has been completed.

_____ _____

(Signature of Person Responsible for Training) (Signature of Safety Manager)

_____ _____

Date Date

MSHA Approved Alternate 5000-23 Form, (June 2009)

Appendix 1

Wirtgen Operations Training Plan

Navajo Mine

North American Coal Bisti Fuels

Mining Work Areas

- Do Not Enter signs will be posted at the end of shift in the active mining area
- Cones will be setup across the width of the pit
- Coal edge(s) may be present in any active mining area
- Vehicles entering should ONLY travel parallel to the Highwall

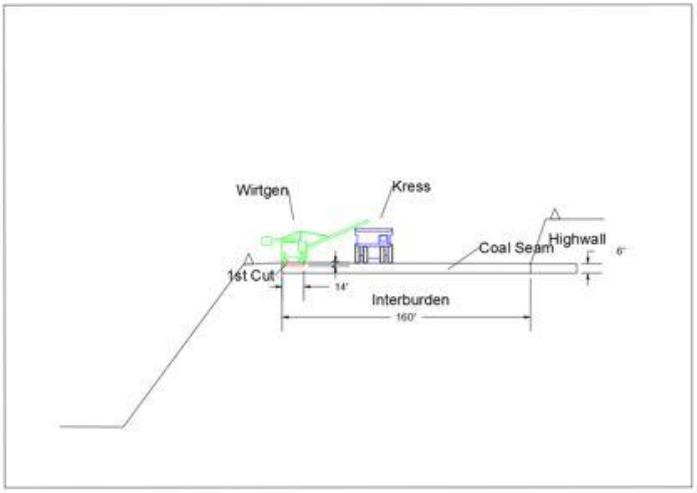
Mining Work Area Hazards

1) Spoils left to the edge of coal. This allows the Wirtgen to run with tracks on top of coal.
2) Cutting edges present (6" – 24" cuts left behind pass.
3) Kress trucks driving & turning
4) Wirtgen loading, turning, and conveyor belt / counter weight
5) Highwall – watch for loose material

Coal Uncovery

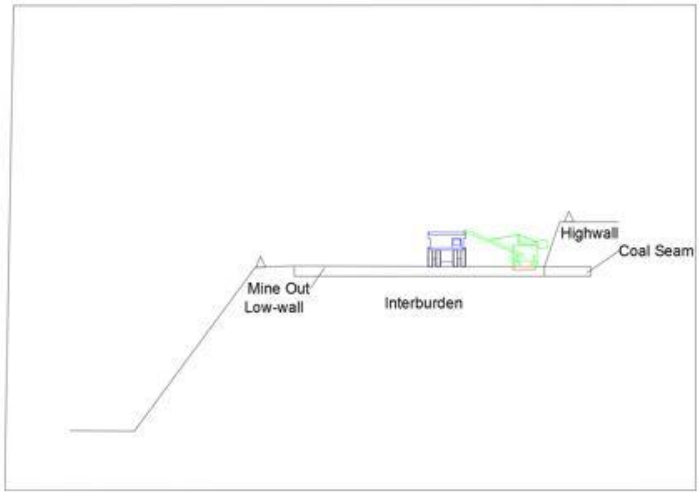
- Leave spoil material along coal edge to allow Wirtgen to run with both tracks on top of coal
- Top of coal will be uncovered with RTD to prevent diluting coal

Cross section: Low wall initial sequence step



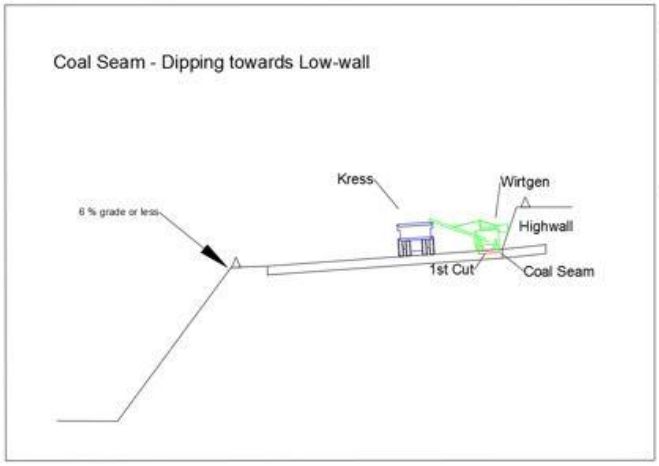
- 1st cut (6”-24” deep) of the 1st pass (14’ wide)
- 1st pass is done on the low-wall side
- Kress truck drives on top of coal between highwall and Wirtgen
- Pit width – 160’
- Coal seam – 6’
- 1 ramp access/exit to stockpile

Cross section: Initial sequence variance *



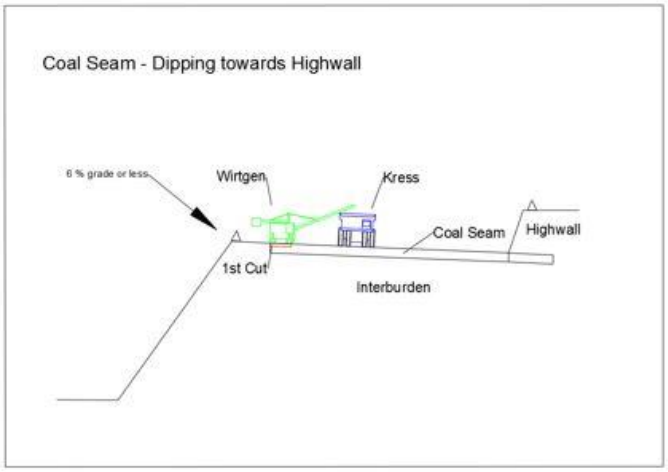
- *Mining sequence variance
- In some instances the Highwall will need to be straightened or realigned
- Requiring the Wirtgen to take its first cut on the Highwall

Cross section: Initial sequence variance *

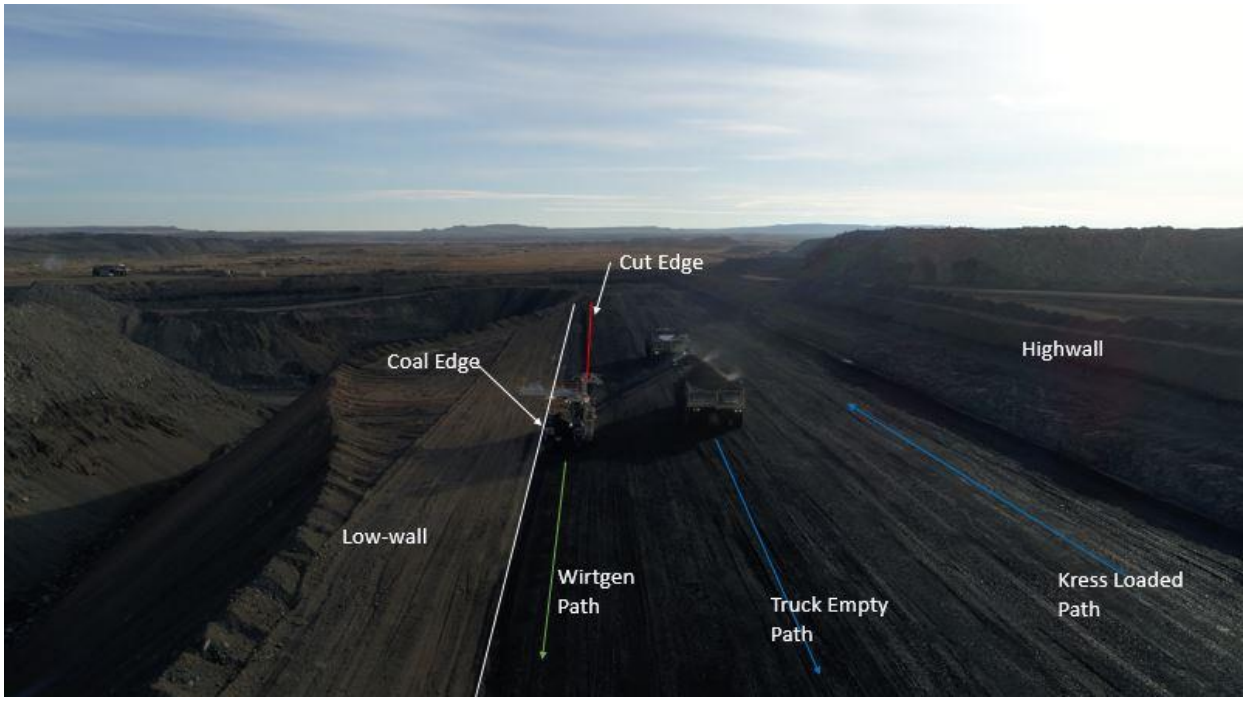


- *Mining sequence variance
- Coal seam is dipping towards the Low-wall causes the trucks to ride above the Wirtgen
- In this situation starting on the Highwall gives the Wirtgen the clearance over the trucks

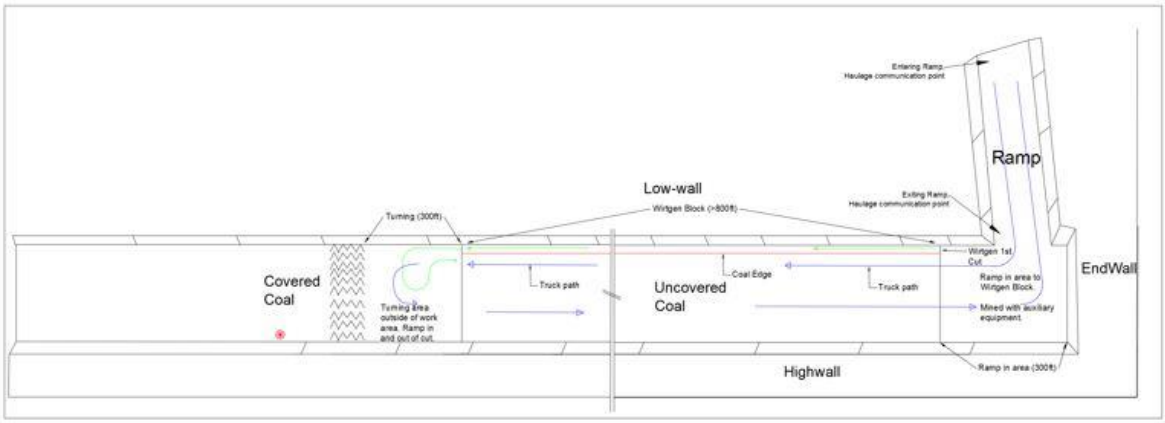
Cross section: Initial sequence variance *



- *Mining sequence variance
- Coal seam is dipping towards the Highwall
- The Wirtgen starts on the Low-wall to clear the height of the trucks

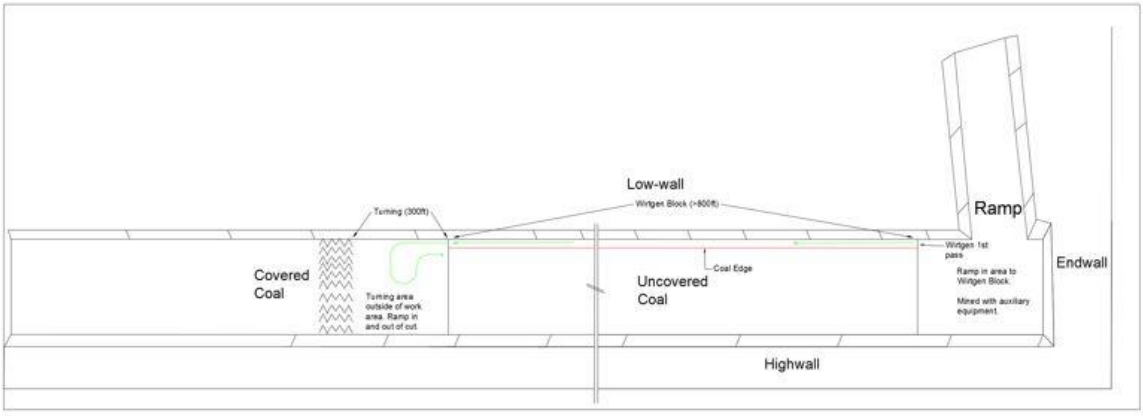


Plan view: Low wall initial sequence step



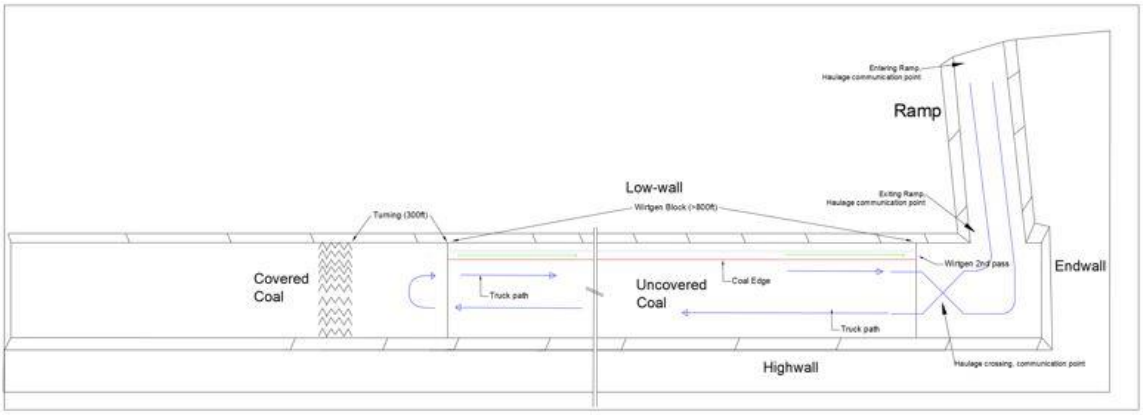
- Trucks come down ramp and line up with Wirtgen on spoil side
- Running parallel to the cut edge
- Truck once loaded, drives to designated turn area, turns, exits across the top of coal to stockpile

Plan view: Low wall Wirtgen turning step



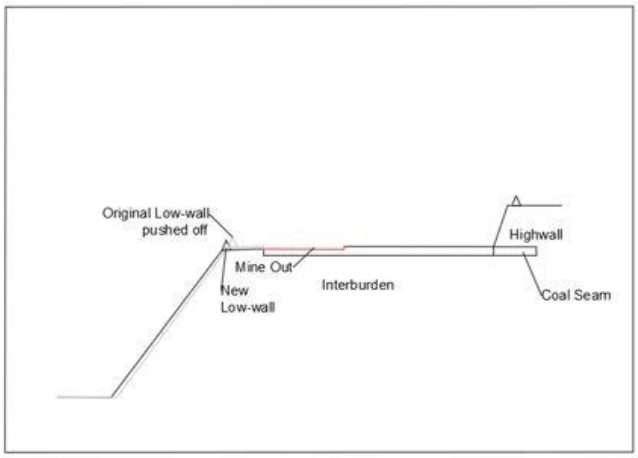
- Trucks on standby while Wirtgen repositions
- Wirtgen ramps out of cut, uses turning area to rotate and reposition
- Discharge conveyor swings 180 degrees to the opposite side
- Wirtgen lines up for next pass

Plan view: Low wall truck turning step



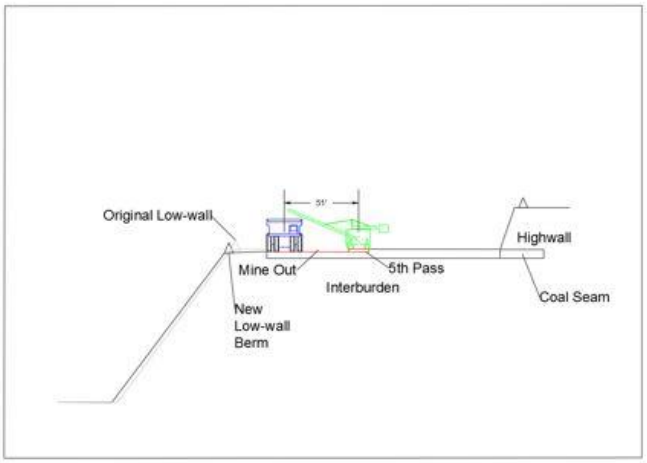
- Trucks haul route is on top of cut, they travel parallel the length of the block
- Trucks turn into position for next pass, in turning area
- Then run parallel to Wirtgen while being loaded on top of cut
- Once loaded exit opposite of turning area to stockpile

Cross section: Transitional step dozer push off



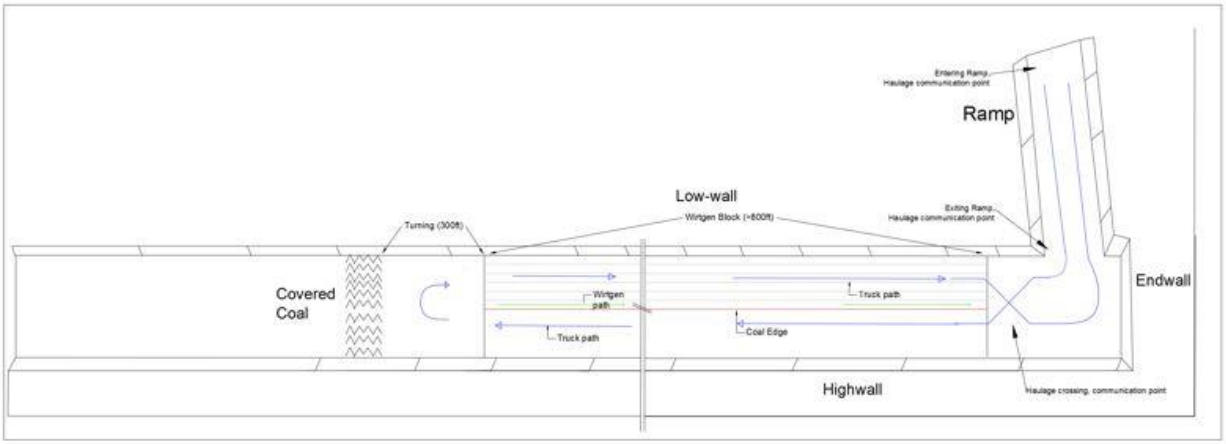
- Approximately after the 2-4th pass the material on the low wall side is pushed off and the berm is reestablished

Cross section: Transitional step

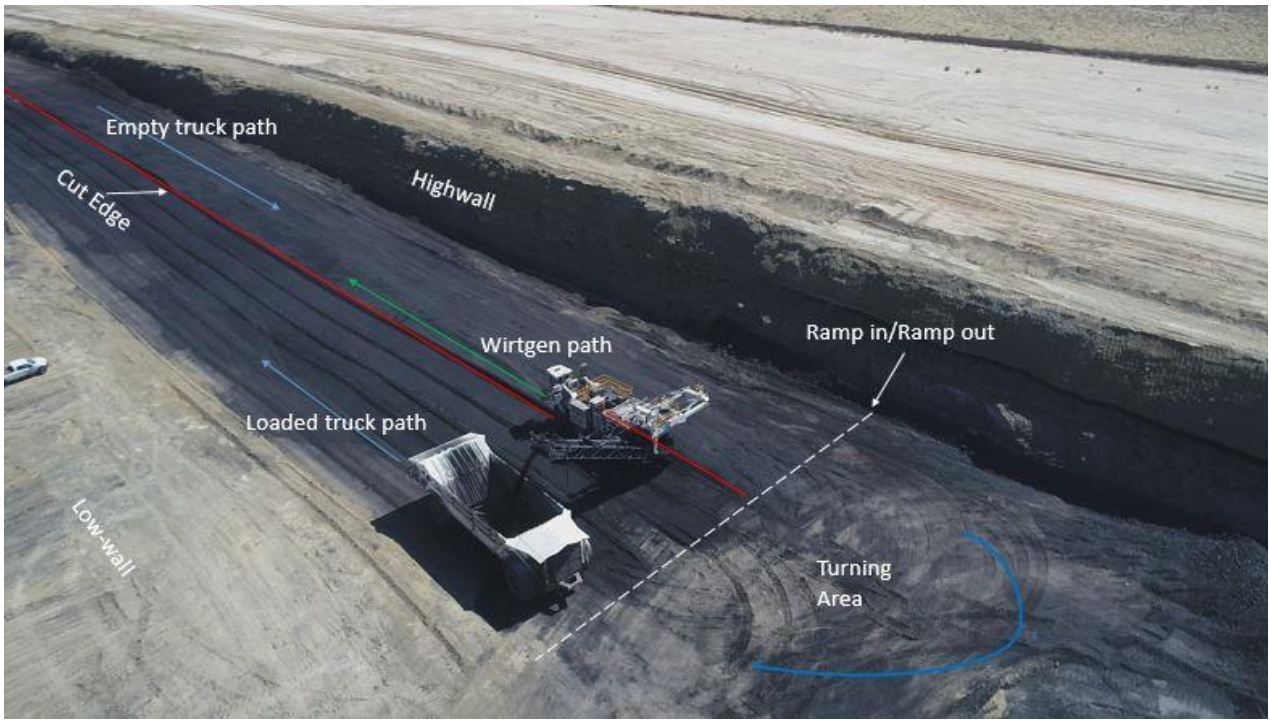


- Generally around the 5-7th passes the trucks will load on the bottom of the cut
- Trucks will then drive to turning area, turn then exit on top of cut

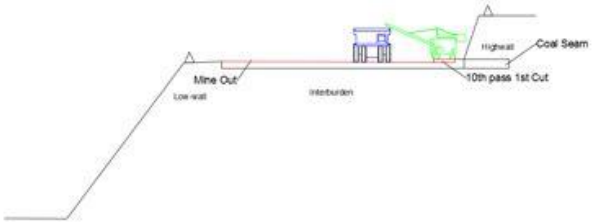
Plan view: Transitional step



- Trucks run parallel to the cut edge in the Wirtgen block
- Trucks turn in designated turning area
- Trucks load on bottom cut

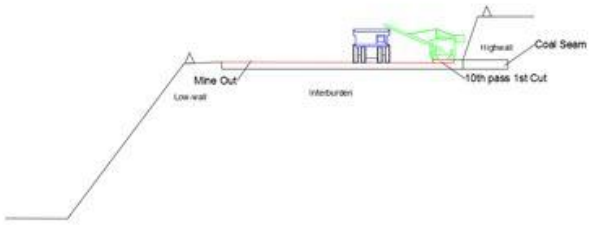


Cross section: Final sequence step



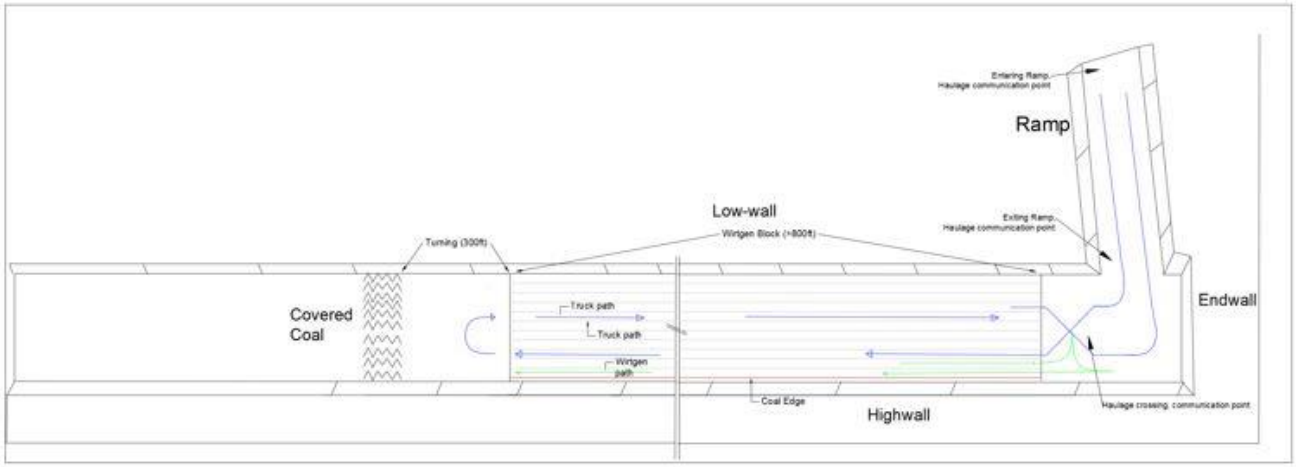
- Wirtgen will mine as close to the Highwall as safely possible
- Wirtgen may need to "square up" the highwall in order to maintain a track on top of coal during last pass

Cross section: Final sequence step 45 degree*



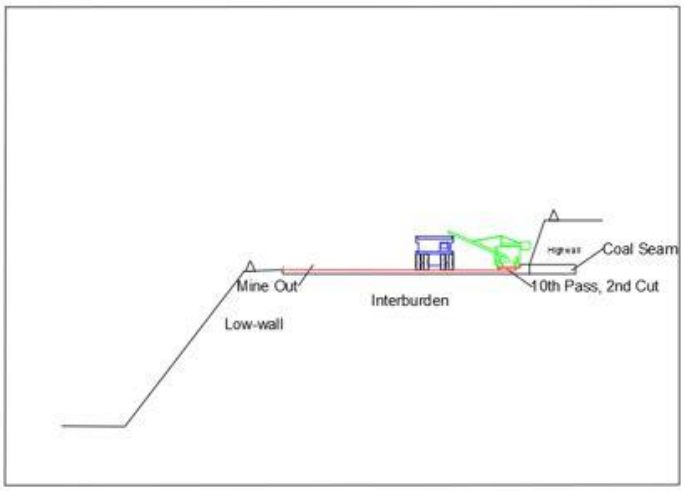
- Wirtgen continues to mine towards the highwall to the last operational pass
- Belt turned in 45 degrees to allow the machine to be close to the Highwall
- Trucks are entering and exiting on low wall side
- Trucks continue to utilize the designated turning area

Plan view: Final sequence step



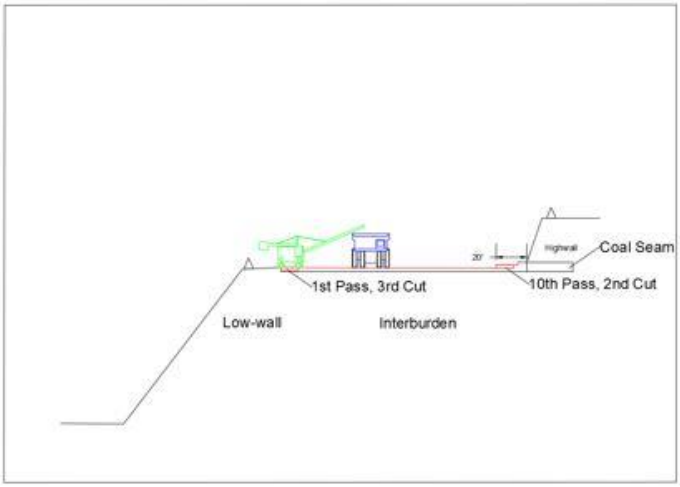
- Trucks remain on low-wall side running parallel to the Wirtgen
- Turning is done in the designated area

Cross section: Final sequence step (multi cut)



- Wirtgen will take last pass along the highwall
- Sequence starts over and the 1st pass of the 2nd cut begins on the low-wall side
- These steps are then repeated for multi cut coal seams

Cross section: Final sequence Night Ops



- Night time operations prevents operators from seeing the proximity of the machine to the highwall
- In these cases the last pass or the remaining 20' will be left and a new cut will be started
- The remaining pass will be taken when the operators are comfortable

Rib Coal – Loader Removal

Operating variations

- Multi ramp access
- One way traffic
- Cross pit bridging

The above items would create potential traffic variations but the general operating practice would remain the same

- Mining sequence will change depending on conditions

Terminology

- Cut – the depth the Wirtgen is mining
- Pass – the number of trips the machine takes across coal. From Low-wall to Highwall
- Target Cut Depth – Depth of cut. Determined by the number of cuts and coal seam thickness
- Multi Cut – coal seams that are thicker than a single cut depth. Requiring multiple cuts to get to floor
- Half Pass/Straightening – A pass that is less then the full width of the machine
- 45 degree/High Wall Pass – the angle of the conveyor belt when mining along the highwall
- Wirtgen Block – Section of uncovered coal to be mined with the Wirtgen
- Turning Area – Designated area for trucks/Wirtgen to maneuver
- Ramp In/Out – Wirtgen digging in/out of coal to get to target cut depth. Typically will occur on each end of the Wirtgen Block
- Coal Edge – Edge of the Pass that is being mined. Do Not Drive Over Coal Edge.
- Rib – Coal left along the highwall or low-wall