KSM 223 Surface Miner

Mining Made simple. No drilling. No blasting.

Efficient. Economical. Eco-friendly

Larsen & Toubro Limited (L&T), India's technology-driven engineering and construction organization, brings you yet another SURFACE MINER KSM 223 tor your mining applications. Equipped with cutting edge technology and numerous user-friendly features. L&Ts KSM 223 cuts, crushes and carries Coal, limestone. And other minerals in a single operation without the need for drilling & blasting.

Rugged and reliable, L&T's KSM 223Surface Miners are designed & manufactured by Larsen & Toubro Limted at our Kansbahal Works in Rourkela. Orlssa, with ISO 9001 for design, manufacture and supply and ISO 14001 accredited on.

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LARSEN & TOUBRO

CUT, CRUSH & CARRY DEPOSITS IN A SINGLE OPERATION

Surface Miners are increasingly finding their way m today's marketplace, especially to mining applications where drilling and blasting is prohibited or uneconomical. They are found to be highly productive and economical in selective mining of coal, limestone and other minerals. Facilitating efficient exploitation of the deposit

The Surface Miner brings with various advantages:

- Environmental-friendly. No drilling. No blasting.
- Minimizes loss of mineral.
- Better recovery of minerals in areas where blasting is prohibited or restricted.
- Minimizes damage to trucks deployed for loading.
- Eliminates primary crushing of mineral completely
- Reduces cost of transportation of minerals by belt conveyors / dumpers.
- Designed for selective mining Depth of cuts can be pre-determined seam by seam.
- Reduces manpower.

KSM 223

Designed for the grime and grind of Industry

L&T's KSM 223 Surface Miner Is designed to weather the roughest climate, the toughest terrain.

KSM 223 is equipped with a number of user friendly features.

The L&T Advantage

- Spacious operator cabin provides operator with dual control panels and wide visibility.
- An emergency drive system is activated in case of main drive failure during operation, providing temporary power.
- Independent track drives facilitate maneuverability.
- Extra rugged machine framework provide stability amidst extreme cutting forces.
- Water sprinkling system suppresses dust generated during cutting of material by sprinkling water on all four sides - front. sides and rear
- Critical drive units for oil lubrication are provided with external oil cooler and 011 filter to maintain operating temperature within safe limits.
- Equipped with large fuel and water tanks.
- Auto height and slope sensors ensure precision cutting.
- Automated safety features ensure retraction of cutting drum to avoid tramp while mining.

TECHNICAL SPECIFICATIONS

ENGINE

Make	Cummins India Limited
Model	VTA 28 C
Type	Turbo-charged after cooled Water cooled 60° Vee engine
No of cylinders	12
Bore	140mm
Stroke	152mm
Piston displacement	28.03 ltr
Engine Rating	800 HP @ 1900 rpm

SPEED / GRADEABILITY

Operating speed	0-30 m/m1n
Travel speed	0-5 km/hr
Theo grade-ability	80 %
Max. transverse gradient	12 %

CUTTING DRUM

Drive	Mechanical
Cutting drum depth	0-350 mm
Cutting drum width	2200 mm
Cuttmg drum diameter with tods	1150mm
Number of cwtting tools on drum	76
Drum inchnation (Max.)	70

DIMENSIONS

Width	3400 mm
Length	8800 mm
Height (drum tip to cabin top)	4350 mm

WEIGHTS

Operating weight (tare)	49 ton
Front track load, full tanks	26 ton
Rear track load. full tanks	30 ton
Operating weight. full tanks	56 ton

CRAWLER TRACKS

No. of crawler tracks	
Front	2
Rear	2
Crawler Tracks	
Front (L X W X H) (mm)	2650)(400 X 818
Rear (I x W x H) (mm)	2650 X 400 X 818

TANK CAPACITIES

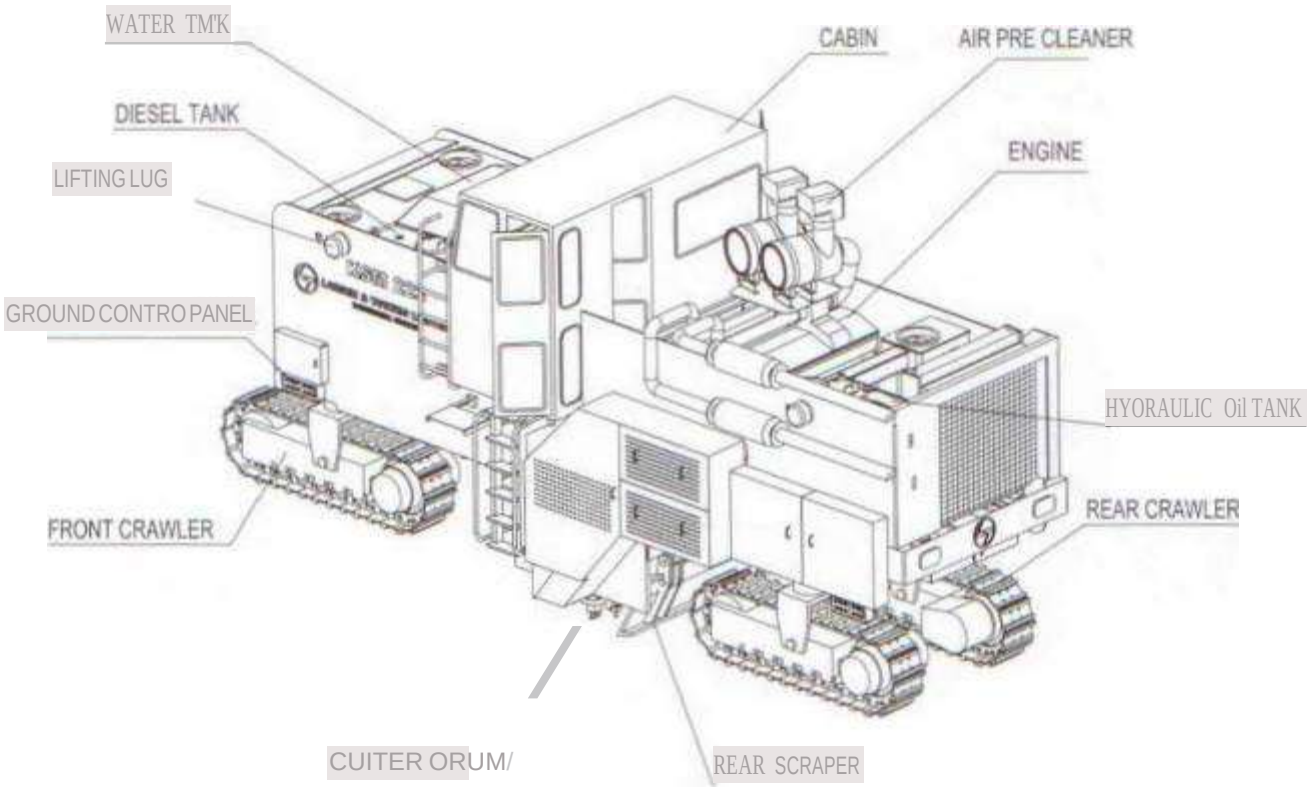
Fuel tank	1500 ltr
Hydraulic oil tank	500 ltr
Water tank	5000 ltr

ELECTRICAL SYSTEM

Control	24 Volt
Lighting	24 Volt

OPTIONAL ATIACHMENT - CONVEYOR

- Integrated discharge conveyors for loading the mined material directly on to the trucks.
- Cabin Air Conditioning.



KSM 223

BASIC FEATURES

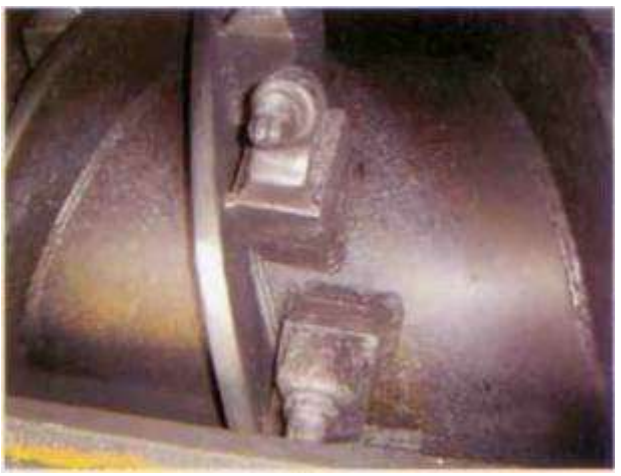
Cutting Drum

The drum speed can be varied by altering belt pulleys Which provide versatility ,V belt tension is maintained hydraulically.

Lacing i.e., Orientation each culling pick is unique for vibration free cutting and proper balancing on the cutting drum, thereby providing optimum use of cutting forces.

Gem box cutting drum is mounted in side the drum and rotates along with drum giving more stability to the cutting drum.

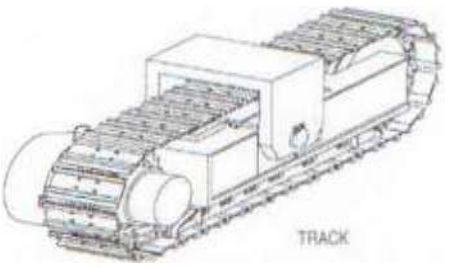
Side view of Cutting Drum



Orientation of cutting picks

ADVANCED TRAVEL DRIVE

- Closed loop hydrostatic drive with variable displacement axial piston pumps and variable displacement axial piston motors to ensure smooth travel of the equipment.
- Choice of 2 speed modes depending on operation along with speed control through joystick eases the operation. All 4 tracks are driven
- Gradeability is 80 % for marching (i.e without cutting)



Travel Drive

LIFTING

- 4 nos. circular guides support the machine with each guide in hydraulic cylinder (jack) providing sturdy support and good cushioning effects.
- Bush Bearings protect the guide, thus increasing the life of the guides.

STEERING

Independent front and rear steering is provided for better control over movement 4 Steering modes are provided:

- Rear
- Coordinated
- Crab
- Front

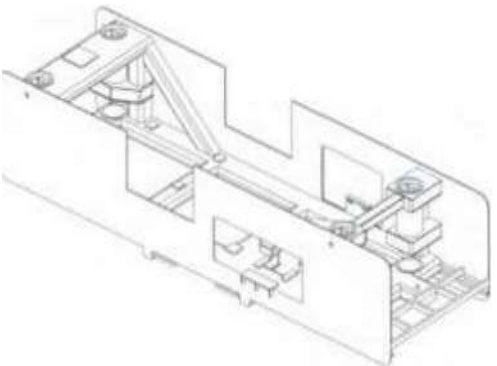
Steering is independent of lifting condition enabling ease in operation.

PUMP STATION

- Pumps are directly mounted on the splitter gear box (Pump Drive) and tandem pump mounting to minimize the transmission losses.
- Also high quality coupling between Engine & Pump Drive is provided to facilitate reduction in transmission losses. (Selected after TVA analysis)
- Normal working pressure is about 50% of max. Permissible pump working pressures for better life.
- Single Pump for off-line cooling & filtration
- Positive suction head reduces cavitations thereby increasing the life of pump

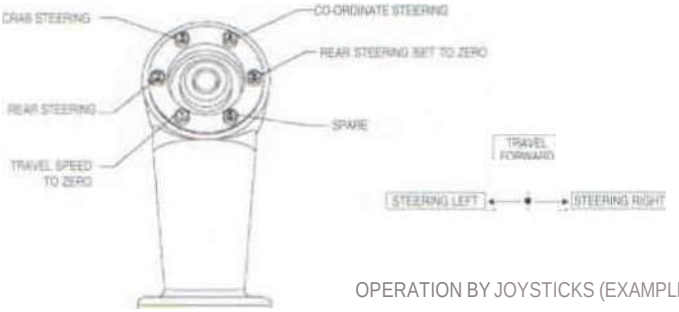
MAIN FRAME

- Mono-comb fabricated structure with **bent HT** plates for higher stiffness & torsional rigidity
- Machining is done after complete fabrication and stress relieving for accurate alignments to avoid distortion later
- Pads for Engine, Clutch and Pump-Drive mounting are machined for ensuring right alignment after dismantling.



CONTROL AND INSTRUMENTATION

- PLC having resistance to v1brahon 1s being used for control with all safety inter-locks for smooth operation of the machine
- Control through Joysticks for major functions
- Dual control m cabin – LH Panel & RH Panel provided with alphanumeric display for current status and fault conditions.
- Essential controls are provided from the ground viz , Emergency stop, Front up/down Scrapper up/down, Water supply pump on/off. Depth side auto height controller...



OPERATION BY JOYSTICKS (EXAMPLE)

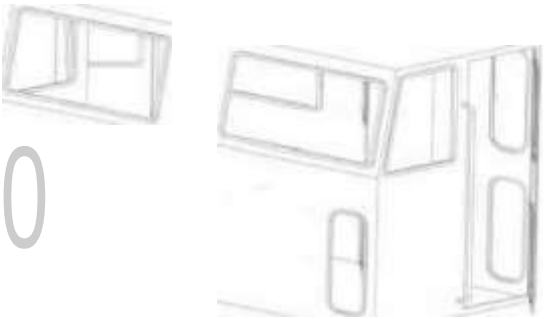
MULTI SWITCH JOYSTICK

SAFETY INTERLOCKS

- Engine overload protection by automatic Advance Speed reduction and machine lifting
- Alarms/stop for high oil temperatures/high pressure etc.

  Engine protection interlocks as per engine manufacturer's standard
- Safety protection for maintenance work
- Emergency Stop Buttons are provided at both the operator panels in the cabin all four ground control stations and in engine chamber.

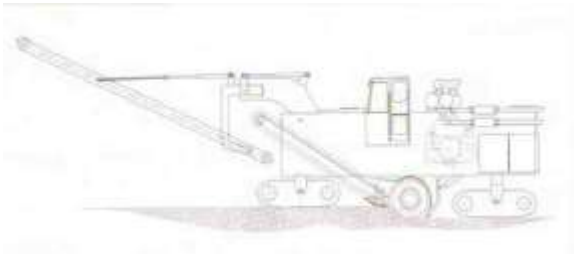
OPERATOR'S CABIN

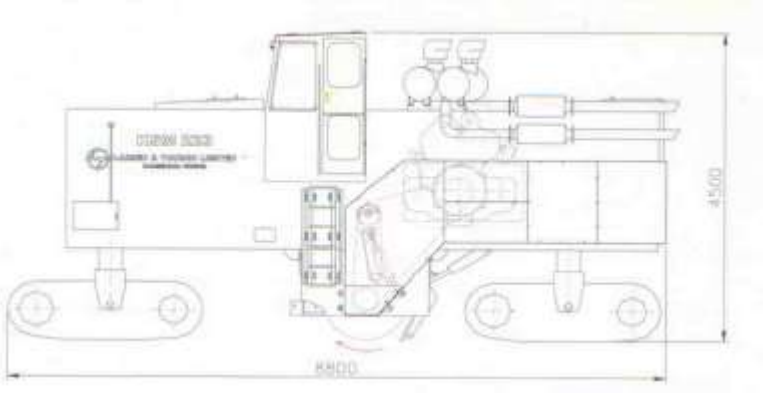


- Spacious cabin
- Dual side control with operator seat on left & right side to enable the operator to observe the reference edge of the cutting drum from the cabin
- Double walled with thermal insulator
- Wide gazing glasses on front and sides for all round view by the operator
- Optional Air Conditioning

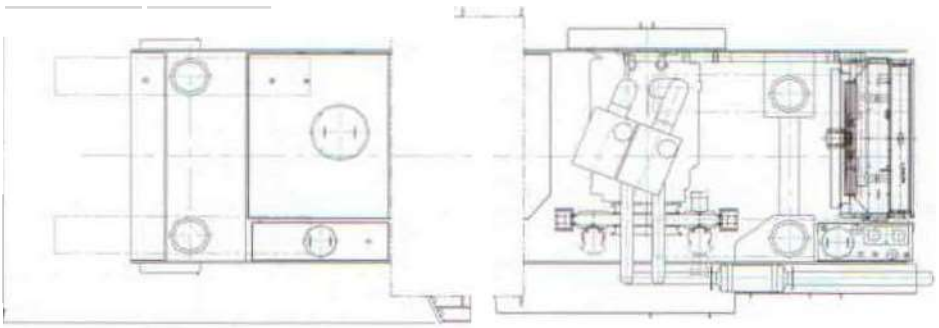
OPTIONAL ATTACHMENT/FEATURES

- Integrated discharge conveyors for loading the mined material directly on to the trucks.
- Air conditioned cabin





SURFACE MINER KSM 223 – SIDE VIEW



SURFACE MINER KSM 223 – PLAN VIEW

PRODUCT SUPPORT

After sales product support 1s provided for the full range of construction and hydraulic equipment supplied by L&T. Service Stallons equipped to overhaul and rebuild customer's machines have been established at Nagpur. Pune, Delhi, Chennai and Durgapur Service engineers based near high machine population sites extend prompt and efficient after- sales service

Track chain assembly using track press

Hydraulic Test Bench