

# 90 MT HYDRAULIC ROUGH TERRAIN (PICK AND CARRY) CRANE

## TECHNICAL SPECIFICATIONS BHEL MINIMUM REQUIREMENT



### GENERAL DESCRIPTION

These specifications cover the furnishing and delivery of a diesel engine driven, 90 Metric Ton (100 US Ton) capacity **HYDRAULIC ROUGH TERRAIN CRANE**. The crane shall be capable of traveling at a minimum speed of 28 km per hour and be able to maneuver on rough ground under adverse conditions. The crane shall be fully equipped, ready for operation, and shall comply in all respect with the following requirement.

### LIFTING CAPACITY

The rated lifting capacity of the crane should not be less than 90 Metric Ton (100 US Ton) at 3 Meter radius with fully retracted boom length of 12 Meter or more with fully extended outrigger. Crane capacity shall not exceed 75% of tipping load. Should have minimum pick and carry capacity of 24 metric tons at a radius of 5 meter with 15 Meter boom.

The crane shall have a fully operational **RATED CAPACITY LIMITER** with graphic Audio / Visual warning system with full function kick-out capability. Operating data shall include: Machine configuration, boom length, head height, % of allowed load, actual load, boom angle, radius of load, and allowed load. Pre-settable alarms include maximum and minimum boom angles, maximum tip height, maximum boom length, swing left/right positions, and operator defined area alarm as standard.

### BOOM

The boom shall be 5 equal length sections; U-shaped with formed steel plate to resist buckling manufactured with high strength steel and is full power extended to minimum 45 Meter. Boom Telescopic sections should be supported with wear shoes to prevent metal to metal contact.

## **BOOM HEAD**

With six nylon load bearing sheaves, and idler sheaves as required with removable rope guard and rope dead end at both side of the boom head. Boom head shall be quick reeve type.

## **BOOM ELEVATION**

With one or two double acting cylinder (s) and integral check valve (s) for controlling boom elevation from -3 degree to 80 degrees.

## **SWING**

With a bi-directional hydraulic swing motor for 360 degree continuous smooth rotation. Swing speed 1.5 RPM. A two position traveling/ swing lock shall be capable of positive house lock in over front and over rear positions. 360 degree swing lock shall be capable of locking the upper structure in any 360 degree location. Swing lock shall be foot operated.

## **OPERATOR'S CAB**

The cab shall be fully enclosed. It shall be fabricated from Galva Neal steel with sufficient doors and windows to have a minimum 180 degree visibility. One man cab. All glass shall be tinted safety glass. Wind shield washer and wiper shall be provided for front and top glass. Right side and rear window glass shall be slide opening type. Cab doors and windows shall be lockable. An adjustable and comfortable operator's seat should be provided. The cab shall be isolated from vibration by rubber mounts.

## **CONTROLS**

All Crane function shall be controlled by ***joystick*** or ***single*** axis controllers and ***foot pedals***. Other cab controls includes hand held outrigger sequence controls and sight level bubble, electric wind shield wiper, electric horn, lights and engine start/stop.

## **CAB INSTRUMENTATION**

Dash mounted back lit gauges shall include hydraulic oil temperature, fuel level, volt meter, engine water temperature and Tachometer.

## **LIGHTS**

Head lights, stop and tail lights, front and rear directional lights with emergency flash.

## **COUNTER WEIGHT**

Sufficient counter weight should be provided for safe crane function, pinned to the upper structure and must be removable.

## **LOAD HOIST SYSTEM**

The load hoist system shall be with piston type 2 speed hydraulic motors and automatic brakes, power up/power down mode of operation with planetary gear reduction unit. With maximum 9500 kg lines pull and line speed of 131 Meter /Minute at high speed. 215 Meter long 22 mm wire rope should be provided for main winch and 152 Meters, 22mm wire rope for auxiliary hoist. The two speed auxiliary winch shall the same size as the main winch.

## **ENGINE**

The engine shall be diesel powered, suitable to use fuel available in India (with 500/350 mg per Kg sulfur content) electric starting system, alternator, voltage regulator, battery, liquid cooling system, lubricating oil filter, and dry type air filter with indicator. The engine is **6 cylinders, 4 cycles**, with **325 BHP at 2000 RPM**. should be capable of powering multiple crane function.

## **FUEL TANK**

Fuel tank should have capacity for holding fuel for **minimum 8 hours** of crane operation.

## **MAIN FRAME**

All **welded** box type construction with **braced** cross members. High strength steel frame, reinforced at critical points. Fenders to be provided for all wheels.

## **OUTRIGGERS**

The crane shall be provided with four hydraulic out riggers, Vertical jack cylinders shall be provided with integral check valves. And shall be equipped with removable and storable light weight floats. All outrigger controls shall be provided inside the operator's cab. Telescoping beam shall extend to minimum 7.9 Meter and retract to minimum travel width of the crane. All outrigger boxes with beam shall be removable for easy transport.

## **TRANSMISSION**

Preferably hydrostatic type, consisting of **Variable Speed Piston Pump(s)** supplying to all wheel drive motors. Must be computer controlled for smooth operations.

## **REVERSAL SIGNAL ALARM**

The crane shall be equipped with a backup alarm.

## **AXLES**

Four or six, heavy-duty fabricated axle housing that support the wheel drive hydraulic motors and connect to the steering system.

## **HYDRAULIC OSCILLATION LOCKOUT**

All axles shall be with full automatic hydraulic oscillation lockout when upper structure rotates past 2.5 degrees of center line.

## **HYDRAULIC SYSTEM**

Pumps shall be piston or gear type and shall provide adequate pressure to power operation of main hoist, boom hoist, telescope, steer, swing and outriggers. Hydraulic oil reservoir shall be all steel fabrication, with internal baffles or diffuser for deaeration. Filters shall be located for easy replacement. Separate control valves shall allow simultaneous operation of crane function.

## **BRAKES**

Full hydraulic independent disc type brakes on all wheel controlled with foot pedal in the cab.

Parking brake shall be spring applied hydraulic released, cab controlled, wet, multiple disc-type integral to the front wheel drive motors.

## **TIRES**

Standard tires shall be manufacturer's first line grade, earthmover type, tubeless and shall have individual rated load carrying capacities equal to the maximum individual tire loading imposed by the operation.

## **STEERING**

Steering shall be hydraulic, offering 2-wheel, 4 wheel "**crab**" and independent rear. Steering controlled from the steering wheel.

## **LUBRICATION**

Moving parts requiring lubrication shall have means provided for such lubrication and be lubricated prior to delivery. All lubricants receptacles (Crank case, Transmission etc.) and hydraulic system shall be filled to proper level before delivery. The crane shall be tagged in a conspicuous place to identify lubricants and hydraulic fluids used.

## **WIRE ROPE**

All wire rope shall be 22mm diameter, type RB, 18X19 rotation resistant extra improved plow steel, and pre formed right lay-regular lay, swaged.

## **SIZE**

Overall width: Not more than 3.65 Meter. (Outrigger retracted)

Overall Length: Maximum 9.40 Meter without boom.  
(14.60 Meter with boom retracted)

Overall height: Not higher than 3.71 Meter.

## **TREATMENT AND PAINTING**

All crane surfaces shall be cleaned, treated, pre-painted and oven baked prior to assembly in accordance with manufacturer's standard practice and color.

## **SERVICING**

On delivery the manufacturer shall assign his engineer for **Assembling, Testing, commissioning and training of BHEL operators and technicians at site for five days.**

## **TECHNICAL PUBLICATIONS AND DRAWINGS**

Three copies of all operations manuals, Parts manuals for all parts of the crane and carrier shall be provided. Hydraulic and electrical schematics shall also be supplied (3 Copies) In English.

**OTHER ITEMS TO BE INCLUDED WITH THE CRANE**

**Full length Fly jib**

**Auxiliary load Hoist equal capacity as main load hoist.**

**Cab Air conditioning**

**Hook blocks- one main 6 sheave hook block with maximum capacity (90Metric ton) with safety latch.**

**One 10 metric ton swivel hook ball with safety latch**

**Auxiliary lifting sheave**

**One Spare rim.**

**Metric lifting capacity charts.**

**Hydraulic counter weight removal system.**

**Hoist drum cable follower for main and auxiliary hoist drums.**

**Boom flood lights.**

**Warning and safety labels.**

**Recommended spare parts list for 2 years operation**

**Warranty- One year or 1500 hours operation.**