

SPECIFICATION OF TRUCK MOUNTED HEAVY DUTY POWER RODDING MACHINE

GENERAL:-

Heavy duty power rodding machine is designed to remove hard chokes, roots of the trees and obstructions from the storm water drain, ducts and sewer lines. The machine shall get a drive from the chassis engine through a Power Take Off (P.T.O). The machine shall be capable of pushing, pulling and rotating 10mm diameter sectional steel sewer rods using various cleaning tools to clean and remove obstruction from storm and sanitary sewer lines. The unit shall be suitable to carry rod storage reel and necessary tools.

The unit shall consist of

- a) Operation Controls
- b) Hydraulic Systems
- c) Rod Drive Mechanism
- d) Rod Storage Reel
- e) Protective Cowling
- f) Rods & Couplings
- g) Controls
- h) Accessories

The above equipment shall be mounted on chassis OF 10 T GVW 3600 WB, with cabin & PTO, Euro III emission standard manufactured by TATA/ASHOK Leyland or equivalent. Bidder shall furnish full details of vehicle chassis. Client shall make arrangements to procure the vehicle with cabin & PTO from the manufacturer. The payment for the chassis shall be made directly by client to the chassis manufacturer/their dealer against proforma invoice. The standard tools accessories and spares supplied with the chassis shall be handed over to the client at the time of delivery of the unit.

The Bidder shall make arrangements for mounting equipment on the chassis according to the rules laid down by the Regional Transport Office, and loads recommended by the chassis manufacturer on the front and rear axles. The client shall make arrangements for registration of the complete unit with the Regional Transport Office, The Government fees required for registration of the units shall be paid by the client.

a) OPERATION CONTROLS:-

The rodding machine shall have control to actuate the pull and push of sewer rods and the rotation in clockwise or counter clockwise direction. The rod travel hydraulic circuit shall have an adjustable spring loaded pressure relief valve for controlling the pressure limit. A reel rotation speed control and an add subtract distance meter to determine the location of the cleaning tool in the sewer line, shall also be provided and located at suitable place from where it will be convenient to operate the machine. Footage counter shall be provided to determine the length of the rod pushed into the sewer line. Safety control shall be provided to preset the maximum force of pushing the rod for choke removal.

The hydraulic oil pressure gauge for the rod travel circuit shall be mounted near the pressure relief valve. The gauge shall show the operator the hydraulic oil pressure being used to push and pull the sewer rods when the rod travel lever is in the rod payout or pullback position.

b) HYDRAULIC SYSTEM:-

There shall be provision of two hydraulic motors of adequate rating one each for rod drive and reel rotation. These shall be driven by dual hydraulic gear pump having a minimum 3 Cu.m/hr capacity for each pump. The hydraulic pump shall be powered by the PTO of the chassis. The system shall have reservoir of 100 liters (minimum) and provided with baffles and vent to provide. Forced circulated for maximum cooling. The system shall be provided with 10 micron filter. The hydraulic pressure lines and fitting shall be for 140 Kg/cm² operating pressure. The system also shall be provided with direction control valves and pressure relief valves. The hydraulic gear pump shall be driven from the vehicle engine through Power Take off (P.T.O). The hydraulic system shall be designed for working at 125% of operating pressure.

c) ROD DRIVE MECHANISM:-

The rod drive mechanism shall be of dual chain type with at least 5 drive dogs of chrome vanadium to engage each coupling of the sectional sewer rods. The chain drive sprocket shafts shall be ball bearing mounted.

d) ROD STORAGE REEL:-

The rod storage reel shall be mounted within a balanced frame which rotates about the axis of rod travel direction. The frame shall be supported on each end by a self aligning bearing. The rod drive end of the machine shall be so positioned lower than the rod reel end support so that the angle of entry of the sewer rods into the manhole shall be minimum. The sewer rods shall enter and leave the storage reel through a guide tube positioned between the reel and rod drive mechanism. The rod storage reel shall be capable of holding 250 rods of 10mm dia sewer rods each having length of 1000 mm.

e) PROTECTIVE COWLING :-

The sewer rodding machine shall be designed to protect the operator from the sewer rods at all times. The body cowling shall be formed in a cylindrical shape to provide operator visibility when driving or positioning for the operation, and to resist impact dents.

For safety, the rod driven head cowling door must remain closed during operation. The operator must not have to open this access door to view the chain driven footage meter. A large door shall be furnished for access to the rod storage compartment.

f) RODS & COUPLING:-

- i) Physical Properties : Approx 1000mm length rod with 10mm diameter.
- ii) Tensile Strength : Minimum 14,000 Kg/sq. cm
- iii) Ultimate Breaking weight of rod only : 10000 Kg.
- iv) Rockwell Hardness : C-34
- v) Torque of Rods : 5 mt. kgs.
- vi) Ultimate Tensile Strength of Rods Coupled in Sections: (For 10mm dia rods – 3500 kgs permissible variations on minus reading not to exceed 4%)

Inside and outside bend or radius curve must not be bent further than 90 degrees. Main section of rod must be perfectly straight upto the point the 90^o bend starts. Radius of bend must be free of Transverse Cracks.

Prior to coating all mill scale must be removed down to the bare metal. Any rod found with serious seams and deep scratched transverse lengthwise shall be rejected. Special coating formula with acid resisting qualities shall be applied, and heat fused at 375 degrees for not less than 30 min. Rods must be coated and heat fused prior to bending.

Coupling must have an outside diameter of 25 mm and length not exceed 65 mm. Coupling must have partition between hooked rod ends, to prevent mis-assembly, and a heel support for rod radius bend. A centrally located guide groove shall be provided around the centre of the coupling directly over the lock pin hole.

g) CONTROLS:-

The controls such as accelerating levers and gauges shall be grouped at one convenient place for easy operation of the machine.

h) ACCESSORIES:-

Following accessories shall be supplied along with each machine. The price of the accessories shall be included in the price.

- (a) Rod guide hose 6 meters long - 6 Nos.
- (b) Lower manhole rod guide brace - 6 Nos.
- (c) Sectional rods dia 10 mm x 1000 mm (approx) long with coupling and nuts – 500 Nos. out of which 100 Nos. shall be mounted on the rod storage reel.
- (d) Assembly wrench - 6 Nos.
- (e) Assembly Turning Handle - 6 Nos.
- (f) Bar turning handle - 6 Nos.
- (g) Pull out turning handle - 6 Nos.
- (h) Pick-up-tool - 6 Nos.
- (i) Standard rod cutters of size 75 mm, 100 mm, 150 mm, 200 mm, 250 mm, and 300 mm (2 Nos. of each size, total 12 Nos.)
- (j) Corks screw cutter of sizes 75mm, 100mm, and 150 mm (4 Nos. of each size, total 12 Nos.)
- (k) Spear head cutter of sizes 50 mm and 100 mm (4 Nos. of each – total 8 Nos)
- (l) Four blade cutter of size 100 mm, 200 mm, 300 mm and 450 mm (4 Nos. of each size – total 16 Nos.)
- (m) Pilot Bullet Tools – 6 Nos.

- (n) Augers of size 75mm, 100 mm, 150 mm and 200 mm (4 Nos. of each size
Total 16 Nos.)
- (o) Repair kit and overhaul kit – 1 Set.
Consists following : -
- 1) Drive chain assembly complies for approx 1 m rods - 1 No.
 - 2) Feed Dogs - 5 Nos.
 - 3) Feed Dog pins with cotters - 10 Nos.
 - 4) Double pitch side plates - 10 Nos.
 - 5) Master link for # 60 rods - 10 Nos.
 - 6) ½ link for # 60 rods. - 10 Nos.
 - 7) Hydraulic oil filter - 2 Nos.
 - 8) Counter - 1 No.
 - 9) Chain drive motor - 1 No.

All the above accessories shall be suitable for 10 mm dia x 1000 mm long sectional rods

PAINTING:-

The entire unit shall be painted with two coats of superior quality anti-corrosive primer with two coats of approved quality paint. The bidder shall get the paints and shades approved from the Engineer.

TRAINING:-

The successful bidder shall arrange at his own cost to train client's operators for operating and maintaining the unit. The training period shall be 3 days.