

## **SPECIFICATION OF TRUCK MOUNTED SEWER JETTING MACHINE**

### **RAMJET® 7000 Lts.**

#### **GENERAL :-**

The truck mounted Sewer Jetting Machine is designed to use high pressure water jets to remove obstruction, soluble grease, sand and other materials from R.C.C/S.W. pipes. The equipment is capable of use in all weather conditions.

#### **OPERATING MECHANISM:-**

The high velocity Sewer Jetting Machine is positioned directly above the manhole. The hose equipped with self-propelled nozzle is then inserted into the manhole. As the water at high pressure flows through the nozzle, forward jet of the nozzle breaks open the sewer blockage, the rear jet of the nozzle propels it and the sewer hose moves forward breaking silt formation. In matter of few minutes the nozzle reaches next manhole. The light material is flushed down the line and the remaining material is pushed backwards. The silt/mud collected at the manhole can be sucked by Suction Unit or manually lifted. The manhole is finally cleaned by hand gun arrangement.

The unit shall be such that 1 driver assisted by two helpers shall be adequate for all operation of the unit. The unit shall consist of:

- a) Prime mover - engine of the chassis shall be used for driving other units through appropriate power take-off unit. (PTO).
- b) Tank
- c) Jetting Pump.
- d) Hose Reel Drum
- e) Sewer Hose
- f) Hydraulic Plant.
- g) Piping
- h) Canopy
- i) Control Panel.
- j) Lateral cleaning system. (including handgun arrangement)
- k) Accessories.
- l) Suitable Indian Vehicle Chassis with Cabin

The above equipment shall be mounted on chassis like TATA / ASHOK Leyland / Eicher or equivalent. Bidder shall furnish full details of vehicle chassis. Bidder shall also make arrangements to procure the vehicle with cabin form the manufacturer. The client will make direct payment to the chassis manufacturer/their dealer against their Proforma invoice to avail Govt. rate. 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) PRIME MOVER :-**

The jetting unit (jetting pump, hydraulic pump etc.) shall be run on the power transmitted from vehicle engine through split shaft P.T.O. (Power Take Off Unit). The P.T.O shall be of sturdy design of reputed make (PZB, SEW, equivalent make) and should be able to provide sufficient power to run the system.

**P.T.O. SPECIFICATIONS : (Power Take-Off Unit):-**

The P.T.O. Unit shall be split shaft horizontal type, fitted with Nickel Chrome Alloy Steel Gears on Heavy Duty Ball Roller bearings in accurately machined housing. The unit shall be designed for horizontal drive. The RPM and direction of rotation of output shaft shall be the same as that of the input shaft. Foot mounting arrangement shall be provided for mounting the P.T.O. Unit.

Shift mechanism with (a) Vehicle Drive (b) Neutral and (c) Pump Drive shall be provided and the same can be operated from inside the cab. The P.T.O. Unit shall be capable of transmitting adequate torque generated by the engine.

**b) TANK:-**

The tank shall be cylindrical in shape with welded torispherical dish ends at front & rear and shall be fabricated from mild steel sheets as per IS:2062 and shall be electrically welded with vaulted bottom and suitable reinforcement.

The effective volume of the tank shall not be less than 7 cubic meters. Tank shall be fabricated out of mild steel sheets, which in no case shall be less than 5 mm thick.

The tank shall be provided with a cross baffles. A drain valve for quick dumping at lowest point in sediment area will be provided at side of the tank. The tank outlet shall incorporate a strainer to filter water going into the pump.

A ladder shall be provided on the tank to provide accessibility to the top of the tank. The tank top shall be equipped with a manhole, self-venting, to allow entry into the tank. The manhole lid shall be gasketed. There shall be a tank filler cap with sieve, which shall be hinged for easy opening and closing without the use of tools.

A suitable full-length acrylic sight glass with the tank (separate tube) shall be provided to observe the water level in the tank.

The tank shall be provided with suitable abrasive resistant, tamper-proof, anti-corrosive treatment internally, which shall be suitable for normal sewage.

**c) HIGH PRESSURE JETTING PUMP:-**

The high pressure triplex jetting pump of imported make and shall be a fully variable unit with a heavy duty, positive displacement, reciprocating plunger and having a discharge capacity of 245 l.p.m., 140 bar pressure to perform the jetting function with a high degree of efficiency and reliability.

The pump shall be of Myers, USA imported make with proven performance.

The pump shall be suitably located on the chassis with provision for stopping the jetting pump without stopping the prime mover.

The pump shall be equipped with pressure relief valve for protection and life extension of jetting pump.

**d) HOSE REEL DRUM :-**

The hose reel drum shall be of sturdy design and shall be designed to take a minimum of 120 mts. of 25mm internal diameter high pressure jetting hose.

The hose reel drum shall be driven through a hydraulic motor preferably of Eaton, USA make to effect the wind and unwind operations.

The hydraulic motor shall be designed for withdrawing the hose at its full length inside the sewer lines against the friction and jetting reaction forces. A manual cranking facility shall be provided.

The high pressure water supply to the jetting hose shall be given through a special rotary swivel arrangement provided at the hose reel drum end.

**e) SEWER HOSE :****DESIGN:-**

Subject hose shall be of 25 mm ID of 120 m length and designed in such a manner so as to facilitate replacement on a powered hose reel without interfering with the original manufacturer's intended minimum bend radius.

**CONSTRUCTION:-**

Subject hose shall be constructed to the following exact specifications. Exception to the following will render alternate hoses not acceptable. The hose shall be Trelleborg , Sweden / Piranha, USA or reputed imported make.

**INNER CORE :-**

Inner core shall be constructed of a special water and grease resistant Styrene-Butadiene Rubber Polymers (SBR) / Polyolefin thermoplastic material.

**REINFORCING MATERIAL:-**

Special synthetic textile braided.

**COVER:-**

A smooth Styrene-Butadiene Rubber Polymers (SBR) / Natural Rubber. (NR) / Polyether-urathene of 1.3 – 1.4 mm thick cover shall be provided.

**MINIMUM BEND RADIUS:-**

110 – 150 mm approx.

**STRENGTH OF HOSE:-****TENSILE STRENGTH:-**

Shall be around 45 KN.

**FITTING PULL OFF:-**

Permanently attached fitting shall be a minimum of 35 KN.

**PRESSURE RATINGS:-****BURST PRESSURE:-**

Shall be minimum of 7500 psi (520 bar)

**WORKING PRESSURE:-**

Shall be minimum of 3000 psi (200 bar).

**DIMENSIONS:-**

Outside diameter for hose shall be minimum approximately :  
37 mm for 25 mm inside dia. hose.

**WEIGHT OF HOSE:-**

Weight of subject hose shall be approximately for 100 mtr. length.

60-88 kg for 25 mm dia. hose.

**TEMPERATURE LIMITS:-**

-40° C to 50° C.

**f) HYDRAULIC PLANT:-**

A Hydraulic Pump shall be of Dowty make and capable of developing a pressure of about 120 - 150 bar approx, powered by P.T.O. The entire hydraulic plant will consist of hydraulic motor, oil reservoir, pipeline with connected hoses, filter, control valve for operation of hydraulic function, etc. It shall be suitably laid along the entire length of the tank and cabin thereby avoiding additional space for the plant.

**g) PIPING :-**

All piping subjected to high pressure shall be fabricated from extra strong pipes and all fittings shall be forged steel. All pipings shall be laid out such that they can drain by gravity or through suitable plugged openings to drain water, when purged with air.

**h) CANOPY:-**

An aluminium chequered plate canopy shall be provided to enclose the complete hose reel drum, control panel and shall have three doors:

- (i) Rear door for jetting operation.
- (ii) Maintenance door for hose reel and mounted components.
- (iii) For manual cranking of hose reel drum.

The canopy shall be provided with streamline construction with chassis of sturdy angles and aluminium chequered plates.

**i) CONTROL PANEL:-**

A control panel shall be provided and located conveniently i.e. at one side of hose reel. All gauges, switches, levers, etc. necessary for the operation of the unit shall be grouped in this control panel so that the operator can have complete control of the operation, from one location.

The following operation points shall be included in the control panel:

- (i) Jetting / Bypass valve lever.
- (ii) Directional control valve lever.
- (iii) Acceleration lever.
- (iv) Pressure gauge.
- (v) Control panel lamp.
- (vi) Low level water indicator.
- (vii) Industrial socket for flash lamp.
- (viii) Toggle switch for beacon.
- (ix) Toggle switch for socket.
- (x) Toggle switch for control panel lamp.
- (xi) Toggle switch for low water level alarm.

**j) LATERAL CLEANING SYSTEM: -**

The lateral cleaning hand gun, complete with 25 mtrs. long, 12.5 mm dia. hose and quick coupling connector shall be provided. The washing down shall be facilitated by two conveniently located connection points. The water shall be made available from the water pump at a reduced pressure to ensure operator's safety.

This will be used for :-

- (i) Cleaning the side gullies of the road.
- (ii) Cleaning the manhole area inside and outside.
- (iii) Servicing the vehicle chassis and unit. Besides, this system has various other uses.
- (iv) Fire fighting, general purpose cleaning and maintenance.
- (v) Street cleaning maintenance.

This system will not only enhance the machine's capability but also increase the efficiency of sewer cleaning process.

**k) ACCESSORIES:-**

The following accessories shall be supplied alongwith each unit.

- i) Set of Nozzles.
  - a) 15° Bullet Nozzle (5 rear jet jets 1 forward)
  - b) 25° Radial Nozzle (5 rear jets 1 forward)
  - c) 35° Tangential Nozzle (6 rear jets)
  - d) 35° Piercing Nozzle (5 rear jets 1 forward)
  - e) 15° Bullet Nozzle. (6 rear jets)
- ii) Al chequered plate special maintenance platform with railing between cabin and tank – 1 No.
- iii) Al chequered plate catwalk with ladder – 1 No.
- iv) Al chequered plate lockable tool box – 1No.
- v) Float switch with indicator and hooter for low water level – 1 No.
- vi) Rotating beacon with cabling – 1 No
- vii) Flash lamp – 1 No.
- viii) Reverse audio visual horn – 1No.
- ix) Mud guards – 2 Nos.
- x) Mud flaps – 4 Nos.
- xi) Visual indicating light for PTO – 1No.
- xii) Foot counter with hose guide assembly – 1No.

**l) VEHICLE CHASSIS:-**

The complete equipment shall be mounted on a suitable chassis with standard day cabin to be supplied by the purchaser (Ashok Leyland / TATA / Eicher). The chassis should be provided with front and rear shock absorbers with five forward and one reverse constant mesh gear box, complete original front show with headlights, starter, dynamo with batteries and fuel tank.

The truck chassis shall have the following approximate specifications:

Wheel Base	4225 mm
Overall length	7710 mm
Max. Width	2310 mm
Max. GVW	16200 kgs.

**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 1 week.

**TESTING AND INSPECTION:-**

- (i) Tests on equipment at manufacturer's premises as required will be carried out in accordance with the manufacturers standard. All inspection, examination and testing shall be carried out in presence of the Engineer's representative in accordance with the specification.
- (ii) If the Engineer's Representative witnesses a test he shall be given a copy of the test results and certificates, upon request.