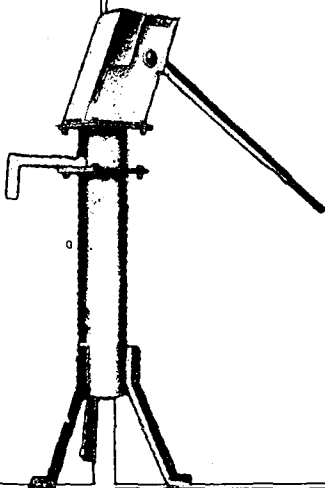


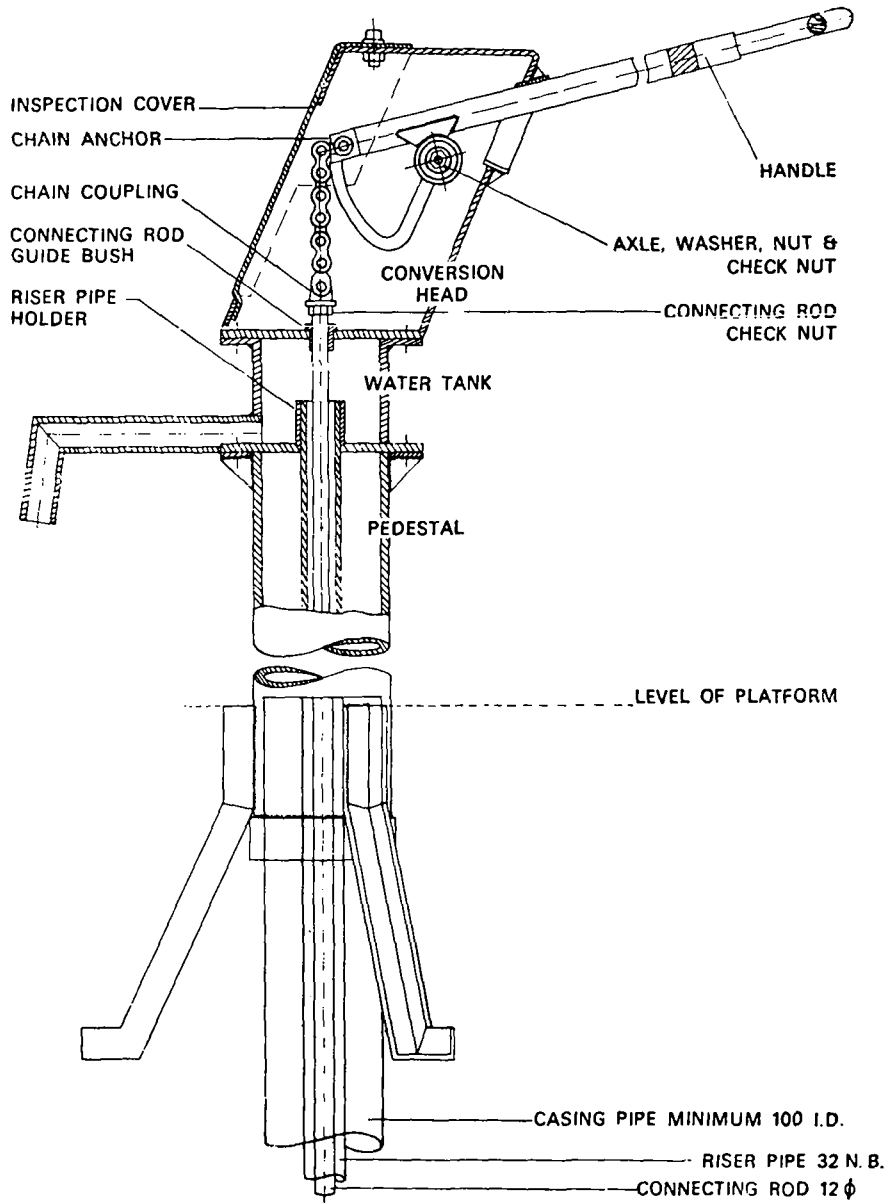
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INSTALLATION  
& MAINTENANCE  
MANUAL

232-2 80IN



# INALSA

## INDIA MARK-II DEEP WELL HANDPUMP INSTALLATION & MAINTENANCE MANUAL

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*This manual includes extracts from the India Mark II Installation Instructions (1979)*

*Published by UNICEF, by their permission*

## **A word about INALSA**

INALSA is well known in India for high quality light engineering products. The Company, along with its two associates, is engaged in the manufacture of several products—including India Mark II Deep Well Handpumps, household knitting machines, precision tools for the engineering industry, special purpose machines and marketing of automobile ancillaries and engineering products like graded and non-graded castings.

The production of Deep Well Handpumps was started in the year 1977, and now INALSA is the largest manufacturer of these pumps in India.

India Mark II Deep Well Handpumps are manufactured in a well-equipped factory in New Delhi, staffed with highly-trained and skilled personnel. Great emphasis is laid on quality control, and rigid standards are maintained to ensure a flawless product that will provide trouble-free service year after year.

In addition to our own quality control team, our products are also tested by an internationally known British firm, specializing in the inspection of engineering goods. The exacting requirements of this agency have helped us in constantly improving our quality.

No pump is approved without a thorough inspection of incoming materials and meticulous checks at every stage of manufacture. In addition, every pump is carefully examined to ensure distortion-free, leak-proof welding and an external finish of the highest quality.

Additionally, the pumps are continuously subjected to field trials so that data regarding their functioning is constantly available for future improvements.

# **About this Manual**

## **Who is this manual for ?**

This manual is for all engineers and mobile maintenance team members who work in rural water supply programmes.

## **What is in this manual ?**

This manual tells you how to install and maintain the India Mark II Deep Well Handpump. The India Mark II Deep Well Handpump is different from other handpumps. So you have to install it in a slightly different way. Keep the manual with you when you install or repair a handpump. Then you can refer to it often. It will make your work easier.

Follow all the instructions. Follow them exactly. Remember to use the checklists at the end of the manual.

# About you and Handpumps

## **Why was the India Mark II Deep Well Handpump developed ?**

Handpumps in villages are used by many people. Sometimes they are used for 18 hours a day, or even more. Because of this, many handpumps breakdown quickly.

The India Mark II Deep Well Handpump is made of very strong material. It is the best handpump made so far. It seldom breaks down. All the parts are checked and tested, so that they fit together perfectly. This means that you do not have to force the parts together.

## **Why is water from a handpump better than water from other sources ?**

The Deep Well Handpump is one of the safest sources of clean, potable water. Water from streams, open wells and tanks usually carries disease. But the tubewell is sealed so that harmful germs cannot enter it; it is a *protected* source of water.

If people want to stay healthy, they must have clean drinking water always. If they drink even a sip of water which is not clean, they can get ill. The handpump brings clean drinking water to the villagers. So it is important that the handpump does not fail. The handpump must work well and work for a long time.

## **Why is your job so important ?**

The handpump should always bring good, potable water to the villagers. If you install the handpump correctly, then it will work properly, and will need very little maintenance. So if your workmanship is good, then you are helping the villagers to stay healthy.

## **Do you drink only clean water ? Do you set an example to the villagers ?**

For your own benefit, you should drink water only from the India Mark II Deep Well Handpump, or water which you know is safe. When you work, the villagers will offer you water. Ask them where it comes from. If it is from an open well, or a tank, or from a stream, don't drink it. Tell the villagers that you drink only tube-well water, because it is safer. Advise them to do the same. In this way, you will set an example to the villagers.

The villagers can see that you are healthy. They can see that you only drink protected water. *You do what you say.* Your example will show the villagers that clean water is connected with good health.

In this way you can teach the villagers some very important things.

You can teach them to value their handpumps more, and to look after their handpumps better.

Then the handpumps which you install will work better and last longer, so your work will be easier, and the villagers will be more healthy.

Many children will grow up stronger and healthier because you provided them with good drinking water. You can be proud of your work.

# About the Villagers and Handpumps

**What should you tell the villagers when you install or repair a handpump ?**

Here are four important things about handpumps. You should help the villagers to understand these things :

- Deep Well Handpump water is better than water from other sources.* Water from ponds, rivers and tanks can contain disease carrying germs. If we drink this water, we can get ill. But the water from a handpump is protected from disease. So if we drink water from a handpump, we will stay healthy.
- People must use handpumps properly.* You should show the villagers how to use the handpump correctly.
- People must maintain handpumps properly.*
- The villagers must contact the appropriate officials if the handpump breaks down.* You should tell the villagers exactly whom to contact, and how to contact that person

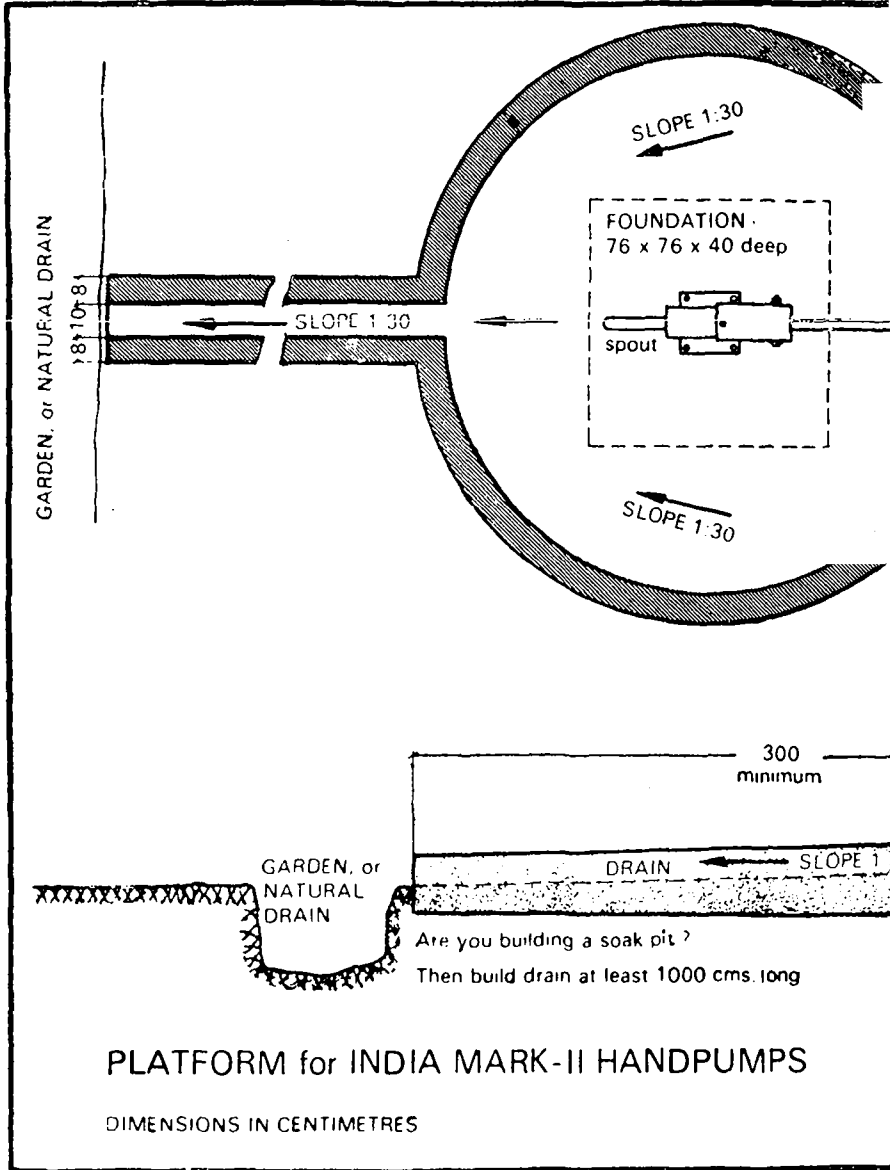


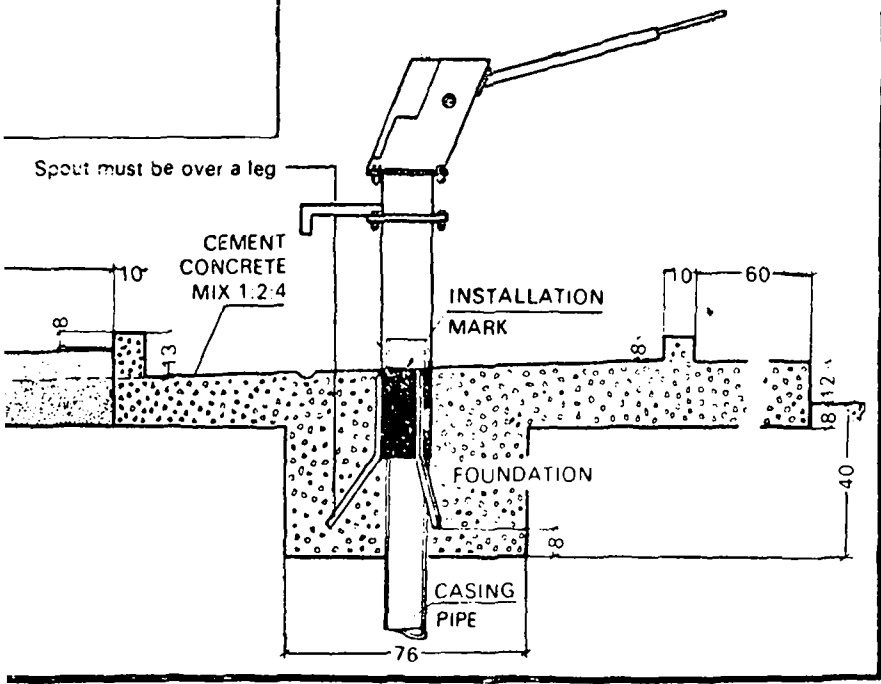
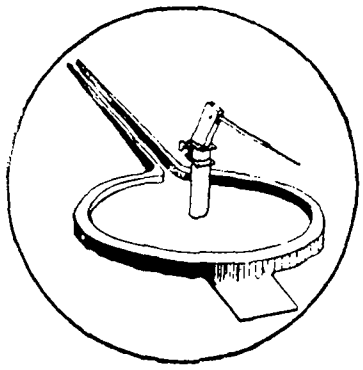
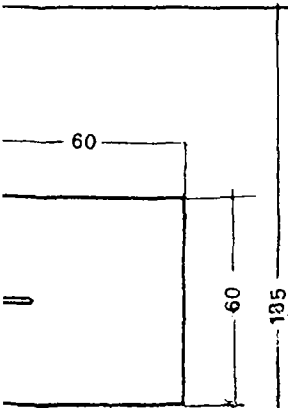
**Here are some “dós” and “don’ts” for using handpumps:**

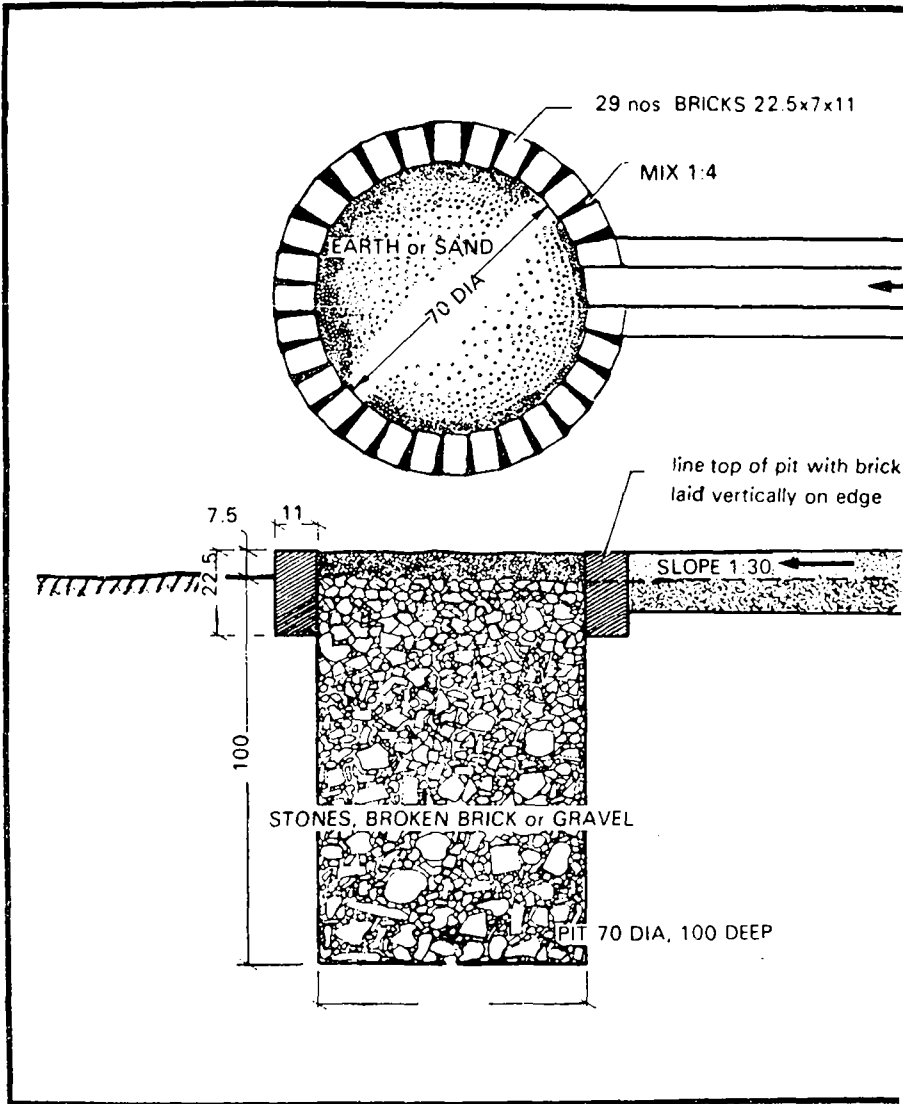
<b>Do</b>	<b>Don’t</b>
<i>Do</i> use the pump gently.	<i>Don’t</i> use the handpump roughly.
<i>Do</i> pump the handle with long, slow strokes.	<i>Don’t</i> pump the handle with short, quick strokes.

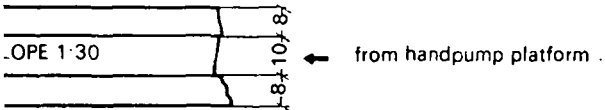
**Here are some “dós” and “don’ts” for maintaining handpumps:**

<b>Do</b>	<b>Don’t</b>
<i>Do</i> sweep the platform regularly.	<i>Don’t</i> let the platform get dirty.
<i>Do</i> keep the area around the platform dry.	<i>Don’t</i> let water collect around the platform.
<i>Do</i> make sure that no one throws rubbish near the pump.	<i>Don’t</i> let rubbish collect near the pump.
<i>Do</i> clean the ground near the pump and keep the drain clean.	<i>Don’t</i> defecate near the pump.
<i>Do</i> make compost far from the pump.	<i>Don’t</i> let animals defecate near the pump.









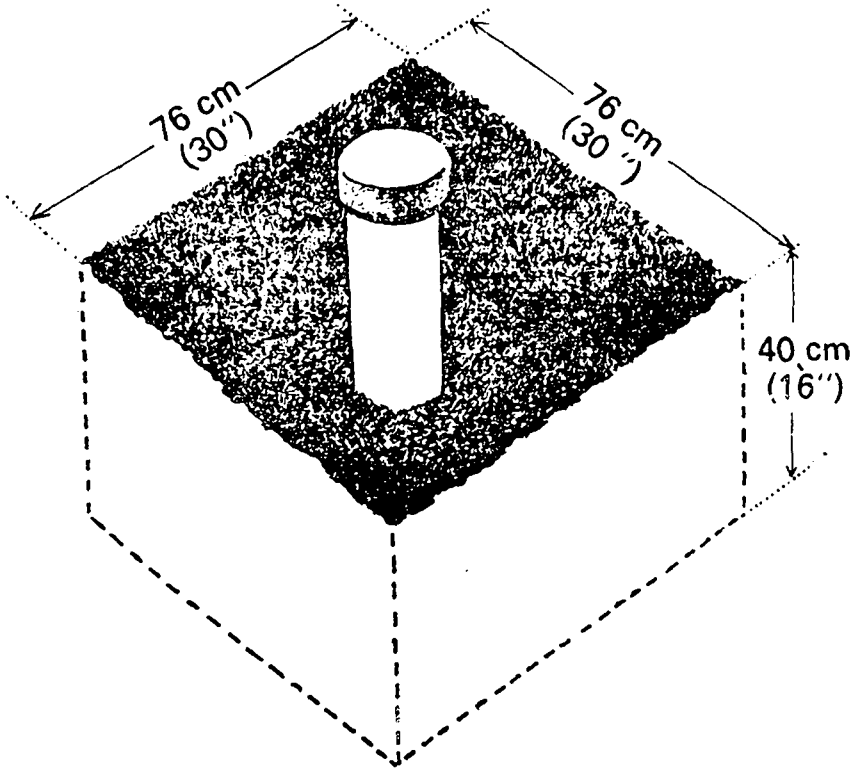
# SOAK PIT for HANDPUMP

DIMENSIONS IN CENTIMETRES

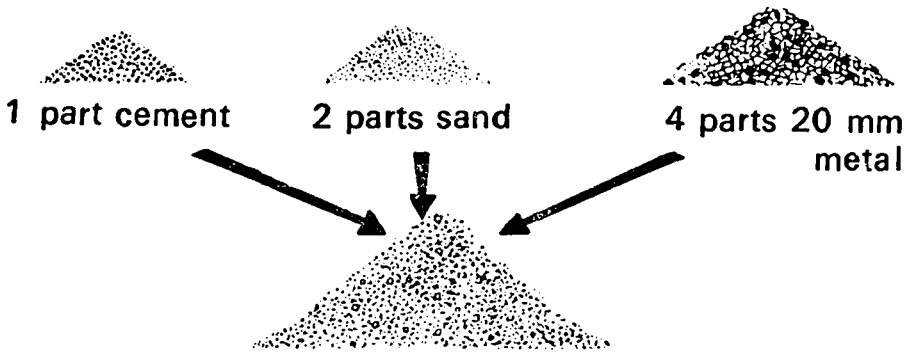
1

① Cover casing pipe

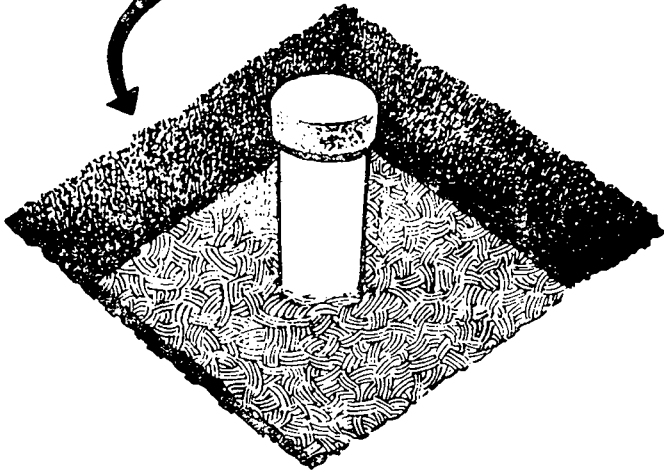
② Dig a square pit around casing pipe  
40 cm (16") deep



## Prepare cement concrete mix

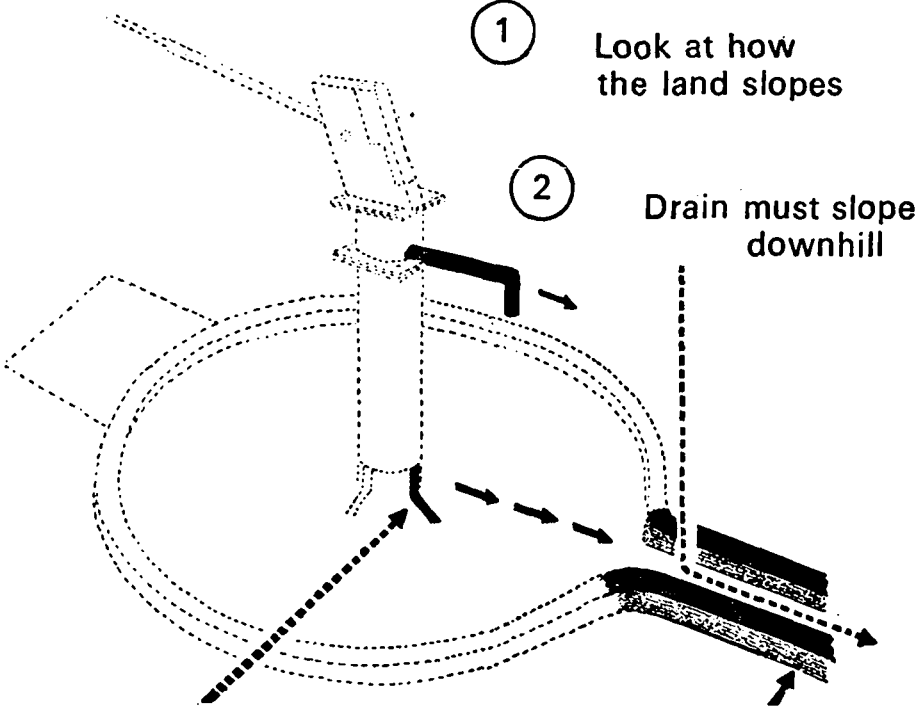


Pour cement concrete  
8 cm (3") deep  
into pit

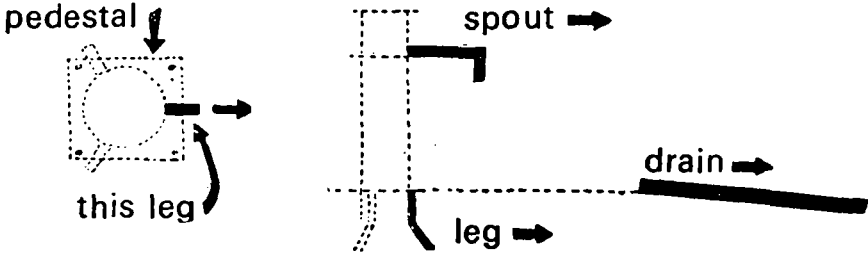


3

Decide now where you will make the drain



This leg and the pump spout must face drain

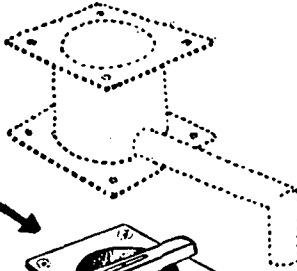




1 Remove cover of casing pipe

2

Place pedestal over casing pipe so that. . . . .



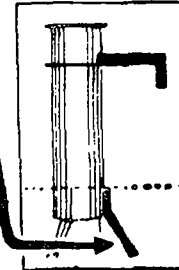
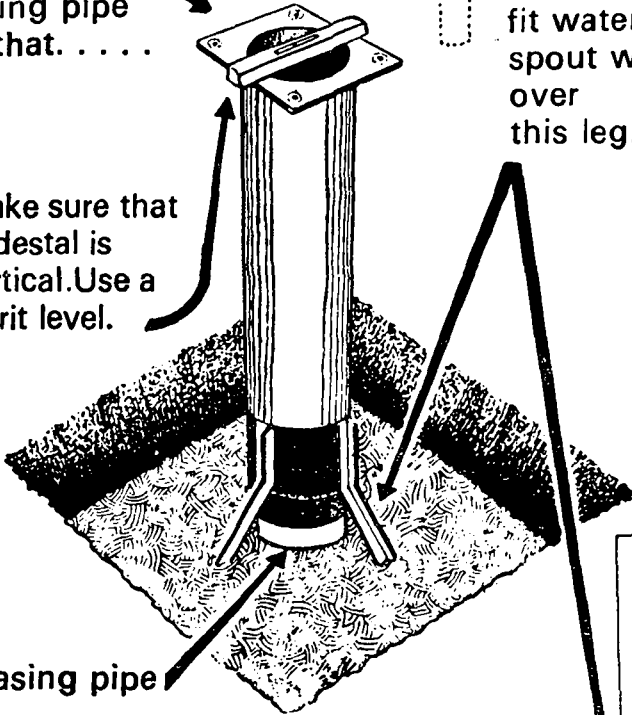
3

. . . When you fit water tank, spout will be over this leg.

4

Make sure that pedestal is vertical. Use a spirit level.

casing pipe



5

1

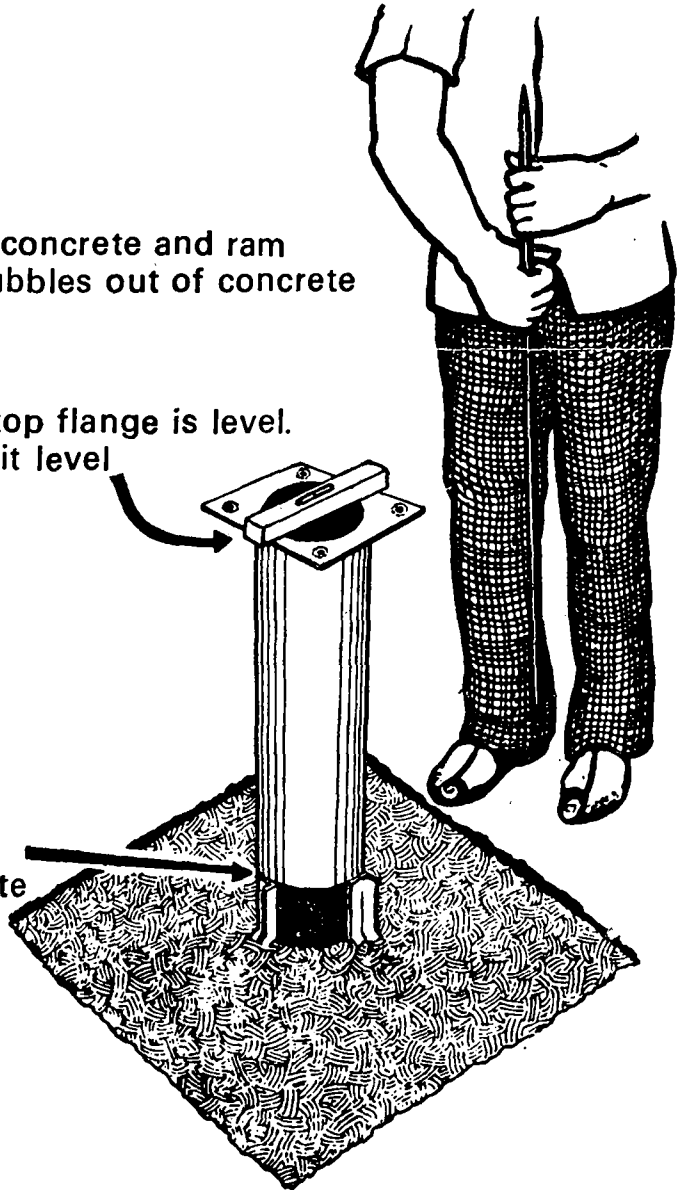
Fill pit with concrete and ram to get air bubbles out of concrete

2

Check that top flange is level.  
Use the spirit level

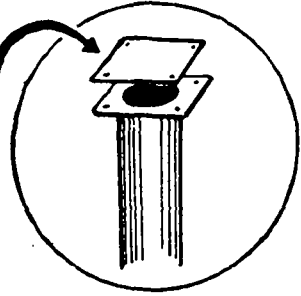
3

Construct platform to top of leg while concrete is still wet

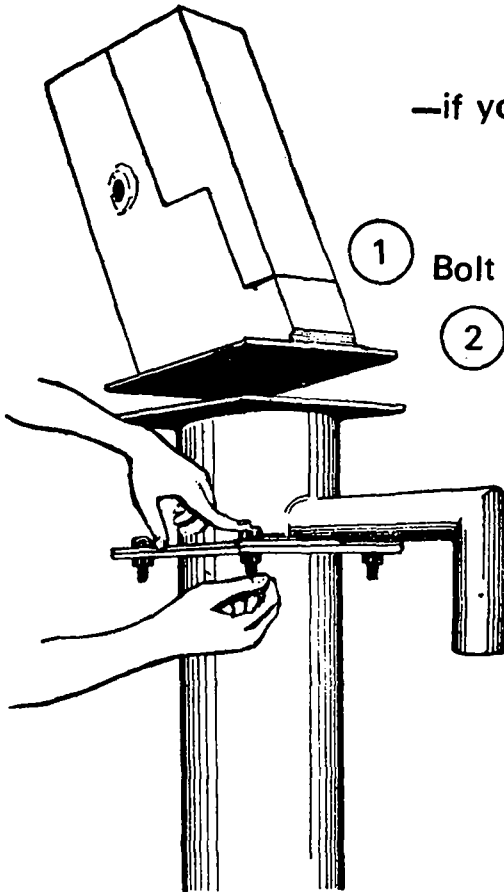


Cover pedestal so that children  
can't put stones in the well

— if you have a cover plate  
use it



— if you don't have  
a cover plate. . . .



1

Bolt on water tank

2

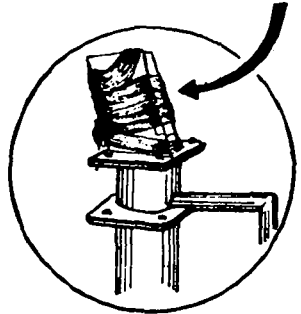
Remove handle  
from head

3

Bolt on head

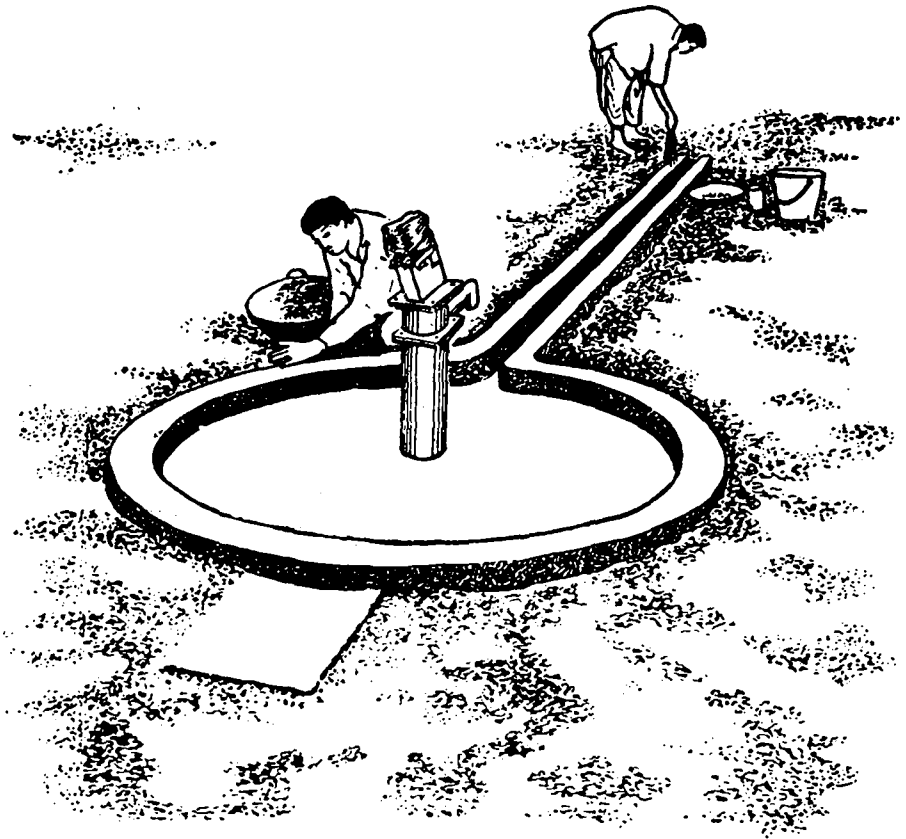
4

Wrap cloth  
around head



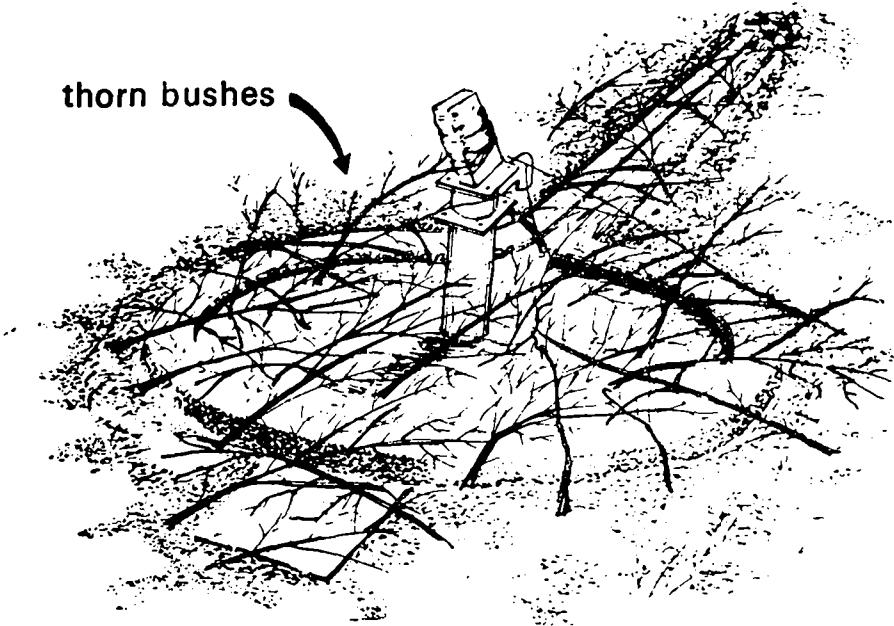
7

Construct platform and drain.  
Use plan on pages 8 and 9.



To cure concrete, block drain  
and fill platform with water.  
Ask villagers  
to keep away  
from installation.

thorn bushes

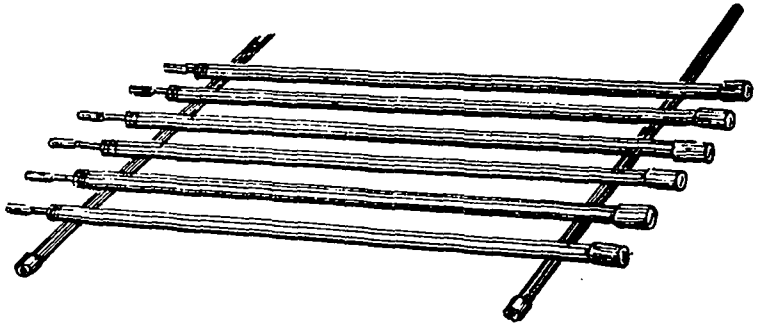


ALLOW CONCRETE TO SET FOR 7 DAYS

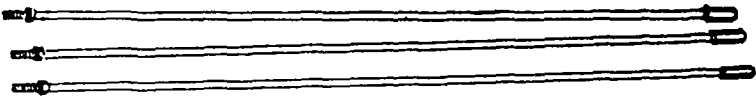
9

SEVEN DAYS LATER

- 1 Lay out pipes and connecting rods. Check that pipes and rods are threaded 40 mm. Check that all threads are good and clean.



- 2 Check rods are fitted with check nuts and couplings



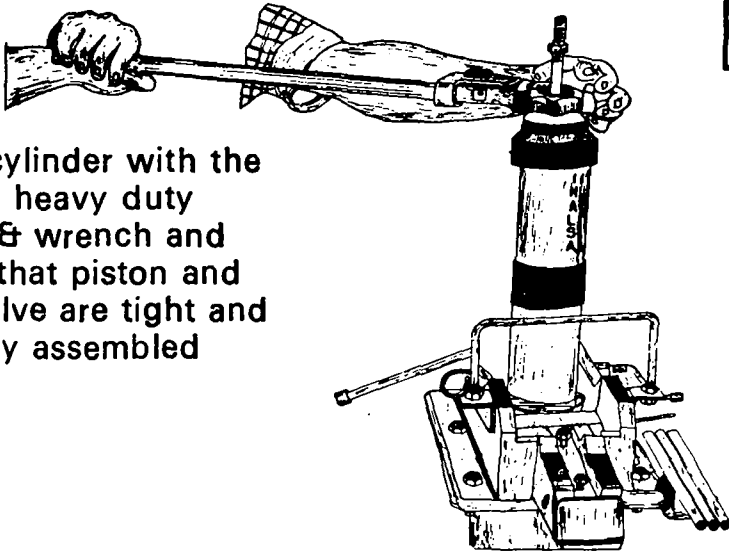
- 3 If rods have couplings welded at one end, fit check nuts at the other end

- 4 Make sure you have spare check nuts



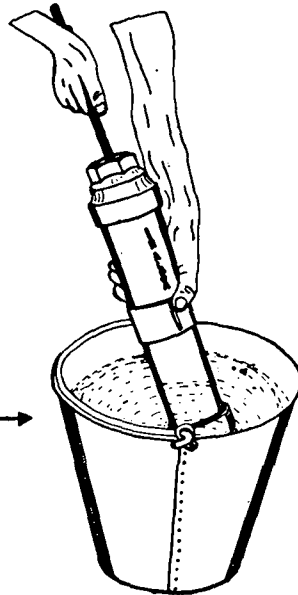
1

Open cylinder with the help of heavy duty clamp & wrench and check that piston and foot-valve are tight and properly assembled



2

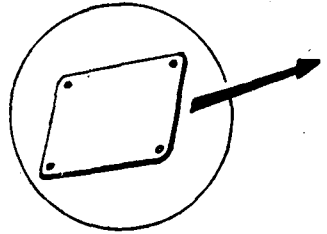
Re-assemble cylinder



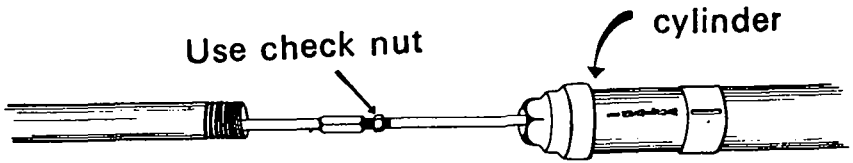
3

Test cylinder in a bucket of water. If foot-valve leaks replace it.

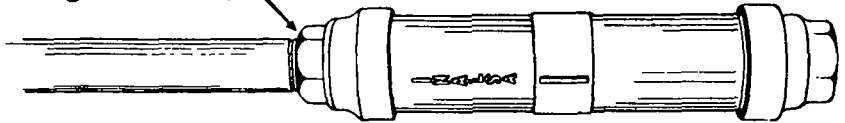
① Remove cover of pedestal



② Join first connecting rod to cylinder rod



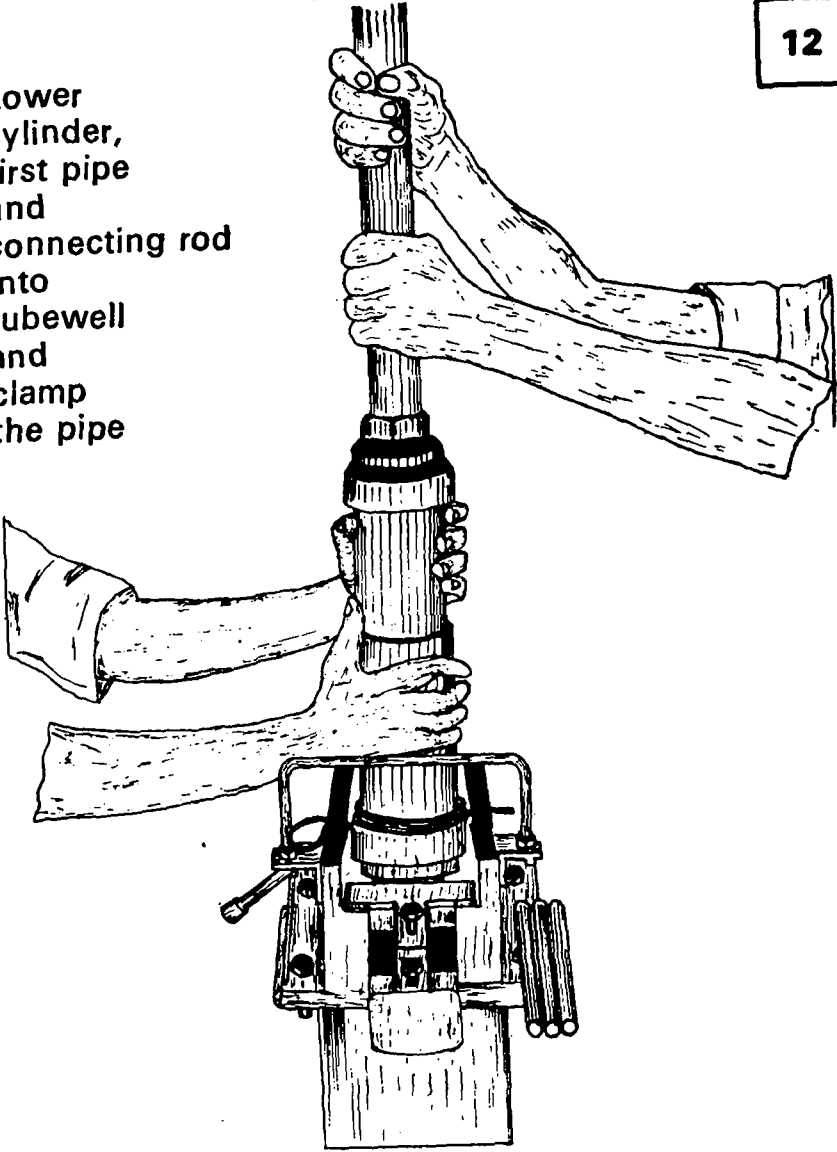
③ Screw first pipe into cylinder.  
Use jointing compound.  
Tighten fully



④ Wipe off excess jointing compound



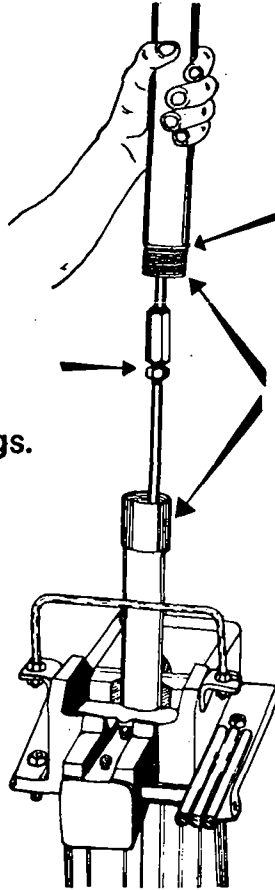
Lower cylinder, first pipe and connecting rod into tubewell and clamp the pipe



13

1

Join connecting rods together. Use check nut at every joint. Tighten fully against couplings.



2

Put jointing compound on pipe threads

3

Join pipes together. Tighten fully.

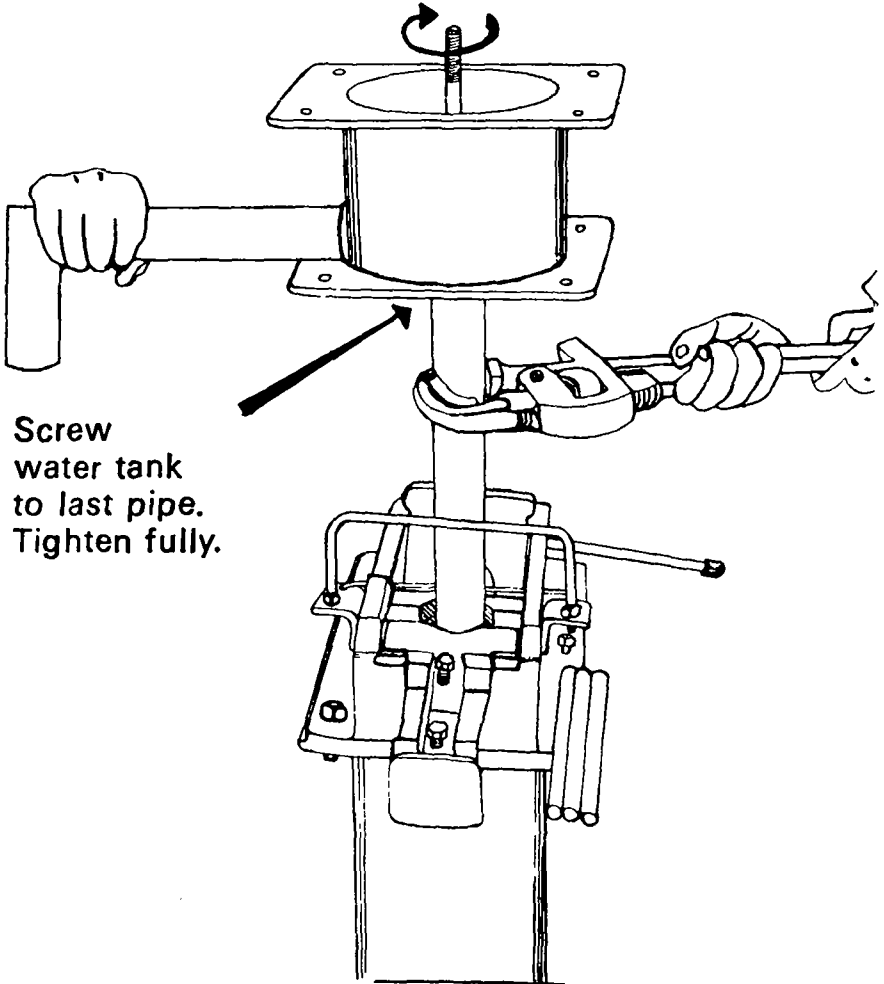
4

Wipe off excess jointing compound or it will spoil the water in the tubewell

5

Lower cylinder, pipe and connecting rod into tubewell and clamp. Continue to last pipe. For this, use heavy duty clamp as shown.

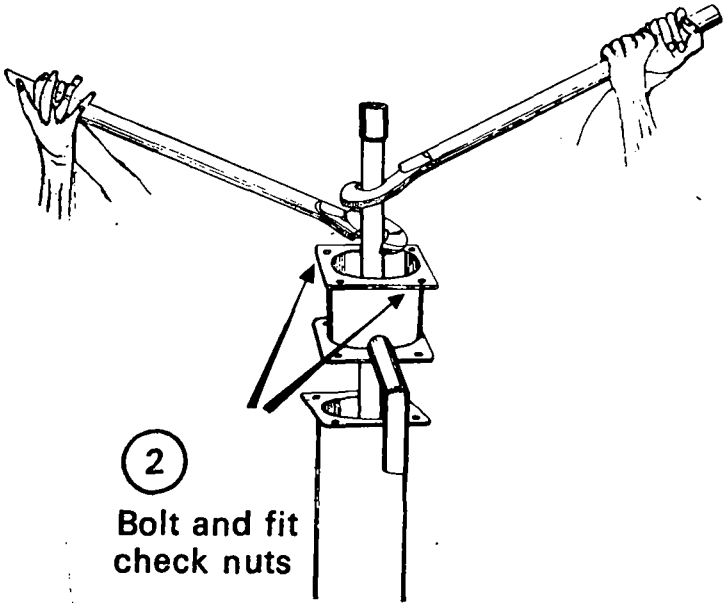
Cylinder should be installed at a minimum depth of 24 metres (80') for maximum efficiency



15

1

Carefully lower water tank on to pedestal with the help of lifter pipe and lifting spanners. Spout must face drain.



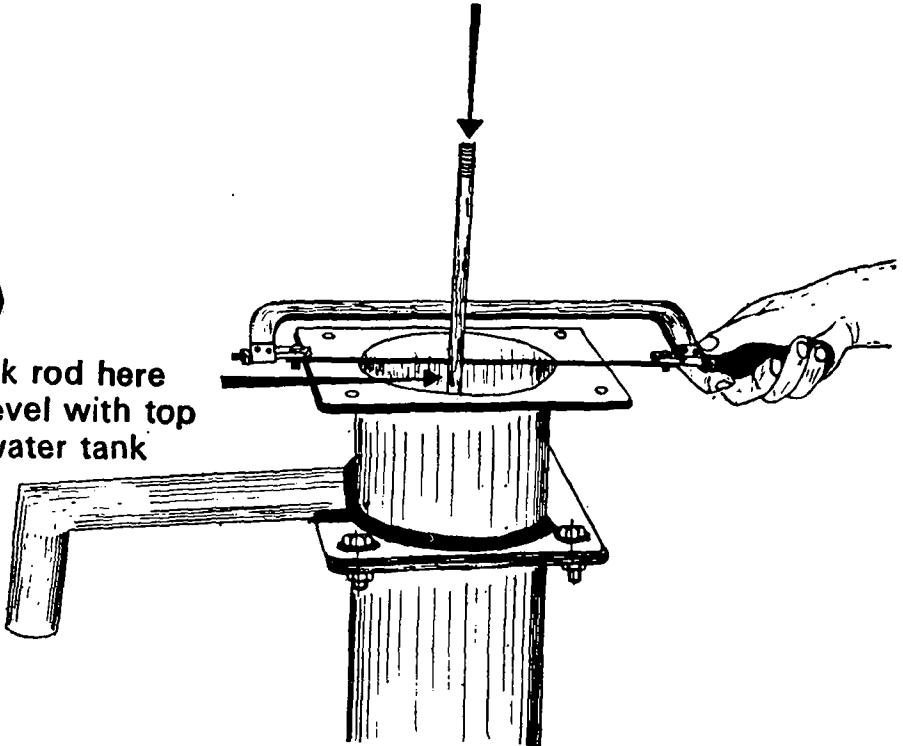
1

16

Push rod down  
as far as  
possible

2

Mark rod here  
— level with top  
of water tank



17

1

Lift rod  
as far as  
possible

4

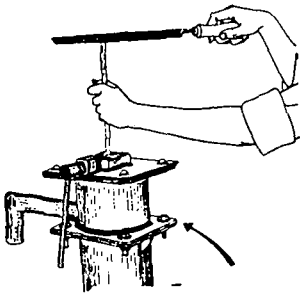
Cut rod  
at mark

2

Clamp  
rod here with  
the help of  
connecting  
rod vice

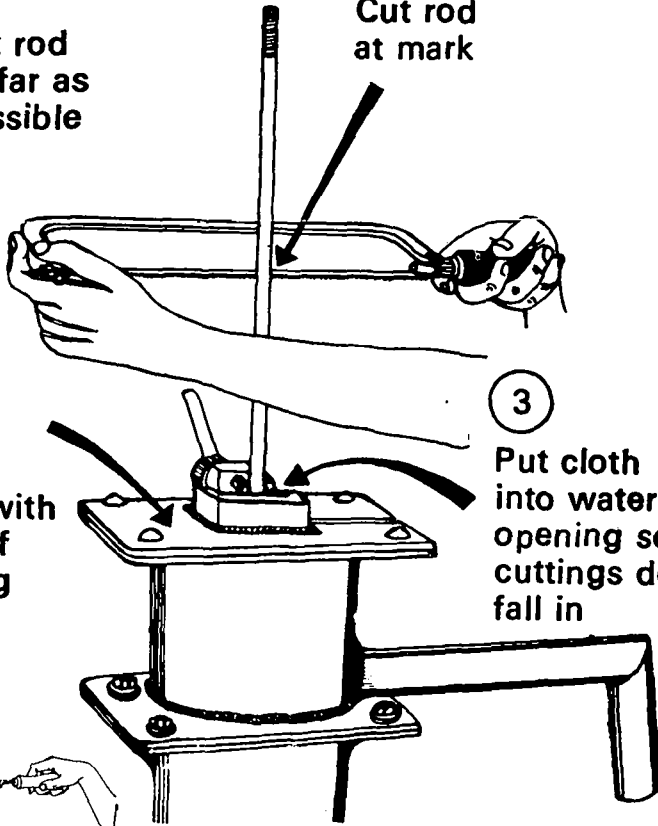
3

Put cloth  
into water tank  
opening so that  
cuttings don't  
fall in



5

File top of rod smooth

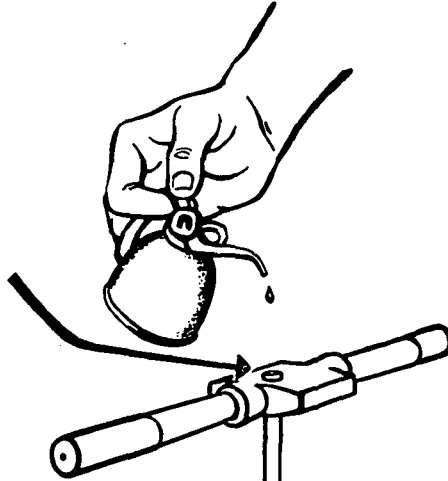


Leave cloth in water tank

18

1

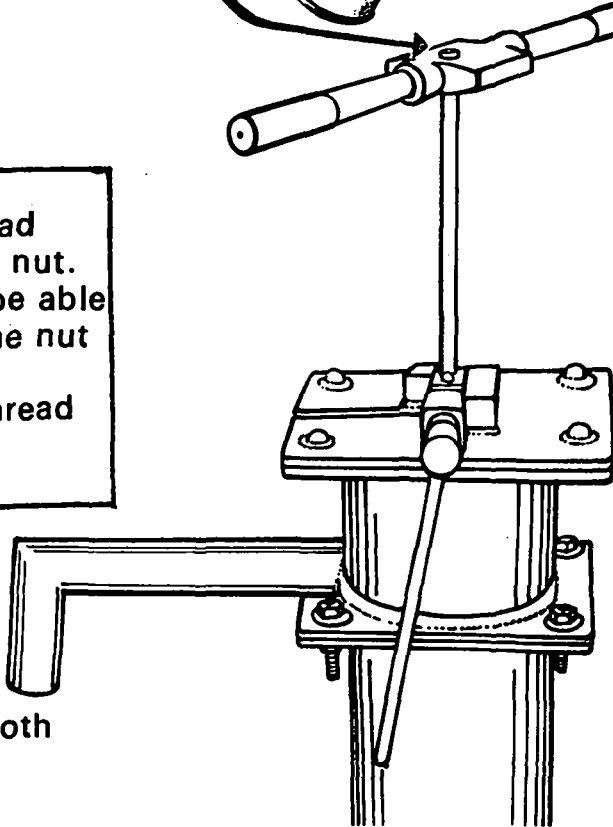
Thread connecting rod for at least 50 mm (2"). Make sure the thread is clean and true.



Check thread with check nut. You must be able to screw the nut all the way down the thread by hand.

2

Now remove cloth



19

1

Remove inspection cover of head

2

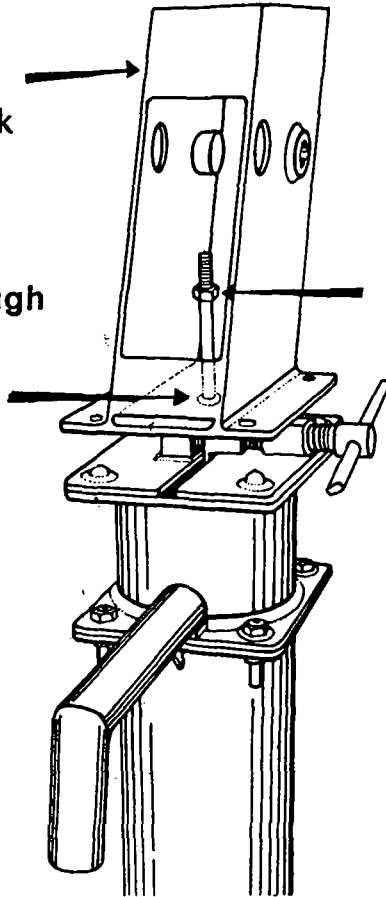
Lower head  
onto water tank

3

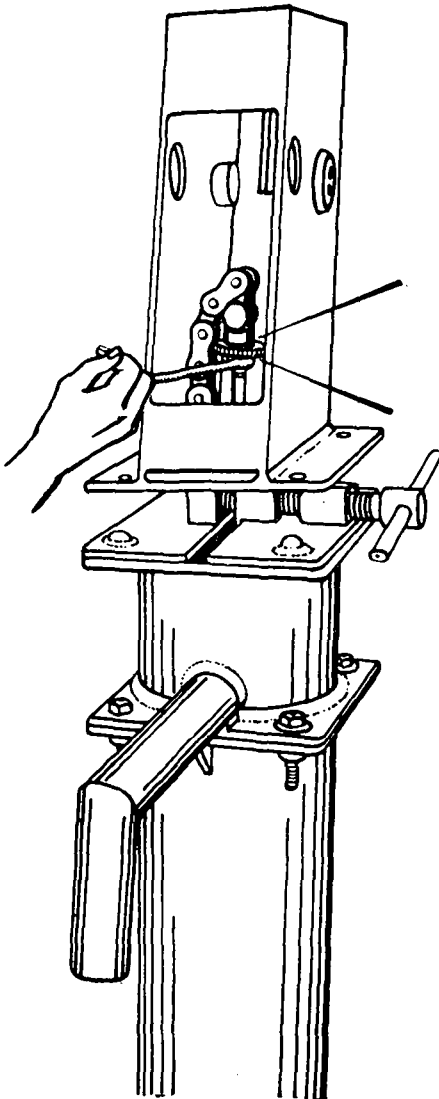
Rod goes through  
guide bush

4

Fit  
check nut  
here







1

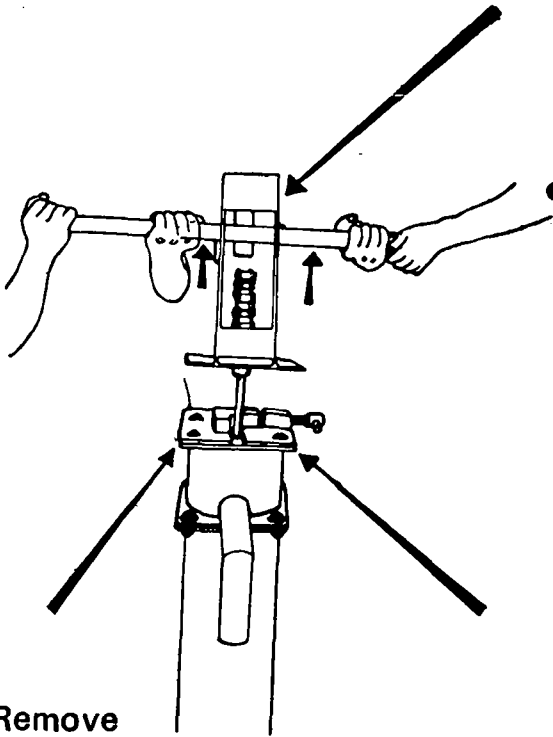
Screw chain onto rod.  
Tighten rod fully into  
chain coupling

2

Use two spanners—  
tighten check nut  
fully against chain  
coupling

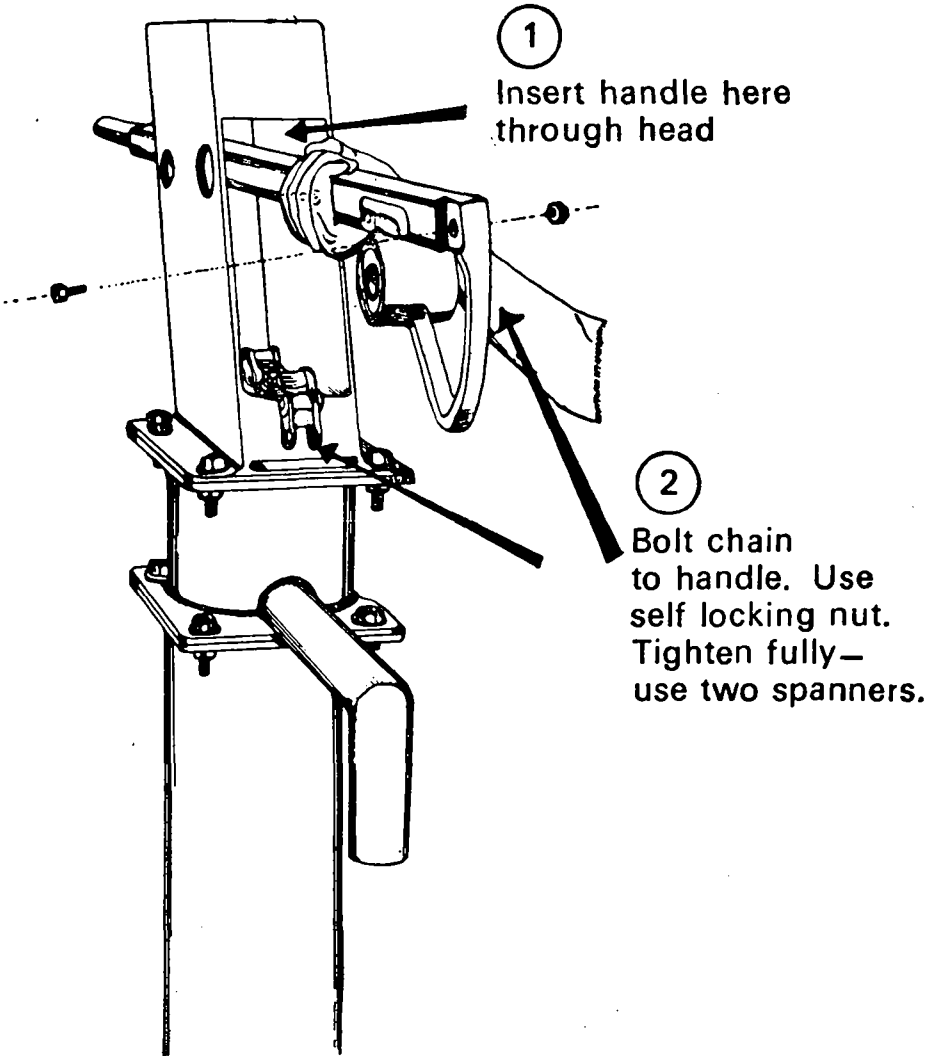
① Lift evenly

③ Lower head  
onto water tank

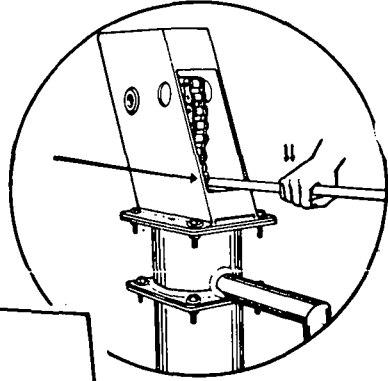


② Remove  
rod clamp

④ Bolt here.  
Fit check nuts.  
Tighten fully.



- ① Lift chain coupling with a crowbar so that you can move the handle easily

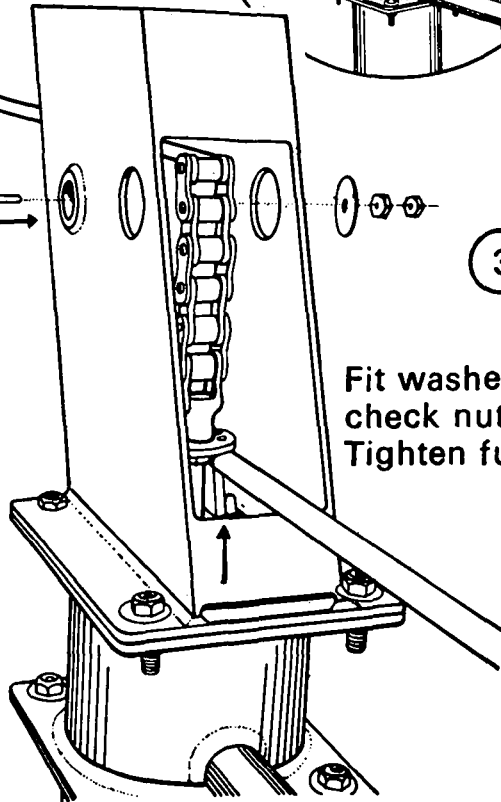


- ② Adjust handle.  
Insert axle

Tap axle lightly.  
Do not hammer

③ Fit washer, nut and  
check nut to axle.  
Tighten fully

- ④ Grease chain



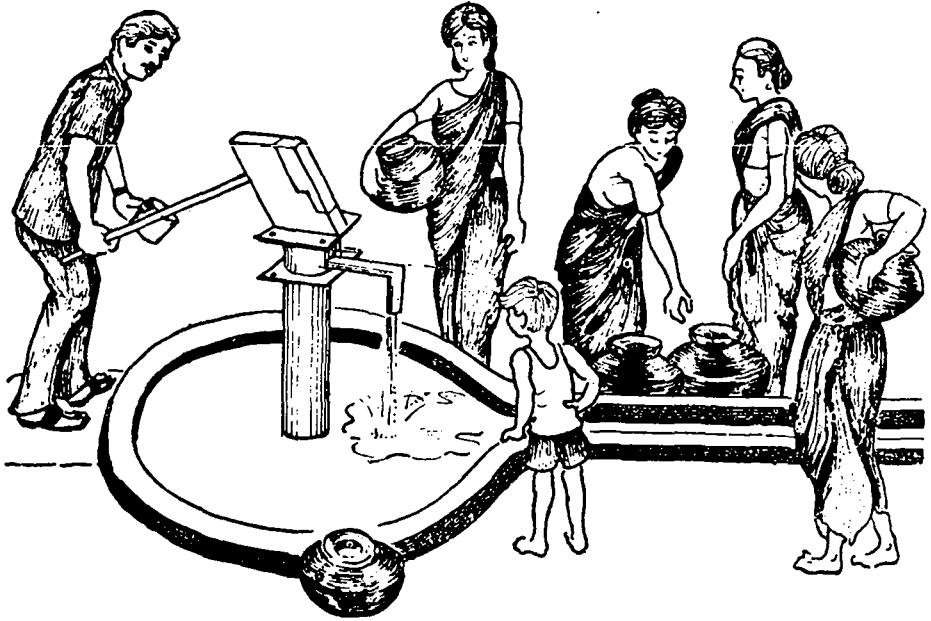
**Now make sure that . . . . .**

- When you pump, the handle touches the top and bottom stops. **If it does not**, then remove head and check the setting of the top connecting rod. Refer to Step 16.
- Connecting rod moves up and down freely in guide bush. **If it does not**, then the rod has been bent while threading.
- You have threaded chain coupling fully on to connecting rod, and you have tightened the lock nut fully.
- You have tightened axle nut and lock nut fully and the axle is firmly retained.
- You have tightened chain anchor bolt and nut fully.
- You have greased the chain.
- All 8 flange bolts are tight, and you have tightened the lock nuts fully.
- You have left nothing inside the head.

**Now fit inspection cover.  
Tighten cover bolt fully.**

- Make sure that all tools and unused parts are clean and loaded on the vehicle.

Pump one hundred times  
to get clean water.



Check the water. Is it clear of  
oil, jointing compound, dirt ?  
If water is not clean, pump another 100 times.

The water may taste strange to the villagers.  
Explain to them that it is good, safe water.  
They will soon get used to it.

# **FINAL CHECK LIST**

**Before you leave, have you . . .**

- talked to the villagers about the importance of the handpump for their health ?
- purged the tubewell ?
- checked the quality and taste of the water ?
- explained to the villagers that the water from the handpump may taste different, or strange? You must explain that they should still drink it, because this water is safe. They will get accustomed to the new taste soon.
- given the villagers the address of your office, so that they can inform you if the pump breaks down ?
- made a note of any problems with the tubewell or the handpump, so that you can report them to the District Executive Engineer ?

# CHLORINATION

Occasionally tubewells get polluted. This may happen if there are natural calamities such as floods, or if the handpump platform gets damaged or destroyed. You will then need to disinfect the tubewells by chlorination.

## **How to chlorinate a tubewell:**

- Remove the four bolts from the lower part of the handpump's water tank. Lift water tank and clamp in the raised position.
- Pour chlorine solution into open end of pedestal. Local health authorities can tell you how much chlorine to use.
- Lower water tank and bolt it back to pedestal. Tighten fully.
- Pump. Stop pumping when the water smells strongly of chlorine.
- The handpump must not be used for *at least one hour*. But it is better if the handpump is not used for 6 hours or more. So, ask the villagers not to use it until the next day.
- The next day, pump until the taste of chlorine is just noticeable in the water.
- Collect a sample of the water. Use a sterile bottle. Seal the bottle and label it.
- Send the sample for bacteriological examination.



### **Important Note**

So far, this manual has explained how to install handpumps on *new* tubewells

You may, however, also have to install handpumps on *old* tubewells.

Before you install a handpump on an old tubewell, take these additional steps :

1. With the help of a string and weight measure the depth of the tubewell.
2. At what depth do you plan to install the handpump cylinder ? Compare the two depths.  
There is no problem if you find that the bottom of the tubewell is at least 3 metres (10 feet) *below* the cylinder. In this case, install the handpump as explained in the manual.
3. But if you find that the bottom of the tubewell is *less* than 3 metres (10 feet) below the cylinder, or that it is *above* the cylinder, it means that the bore is filling up with mud or sand.

In that case, arrange for the drilling team to visit site and to flush the bore.

Afterwards, measure the depth of the tubewell again. Install the handpump only *after* all mud and sand has been removed from the bore.

# **Maintenance of India Mark II Deep Well Handpumps**

To ensure a continuous supply of safe drinking water to the people of those villages where India Mark II Deep Well Handpumps have been installed, regular maintenance is required which would prevent breakdowns and ensure *good and continuous working of the handpumps*. The Block Inspector cum-Mechanic and the District Mobile Maintenance Team should do regular preventive maintenance. The Block Inspector cum-Mechanic should look after a maximum of 50 handpumps in a well-defined area. *His contribution to the good functioning of the 3-tier maintenance system will depend on his regular visits to the handpump sites in his area. His task should be confined to the maintenance of the above-ground structure, i.e. the pumphead, platform and drainage. When he anticipates a major breakdown on a handpump, he informs the District Mobile Maintenance Team. He does the same when he encounters, on his daily rounds, a broken-down handpump. In doing so he will, thus, provide to the District Engineer the relevant information pertaining to the operational condition of the handpumps in his area of operation.*

The following are the check-points a mechanic should *undertake for each and every hand pump he visits on a weekly basis* :

1. Tighten all nuts and bolts of the above-ground mechanisms; replace bolts, nuts, and washers, if necessary.
2. Open up front cover of tophead. Clean the insides of tophead, apply a little oil to chain.

3. Operate the handpump and check whether the discharge is normal. This will assess the working condition of the cylinder piston and foot-valve. If discharge is not normal, inform District Engineer for necessary repairs by District Mobile Team.
4. Remove all rust patches on inside and outside of handpump head. Use wire brush and sandpaper. Apply anti-rust paint.
5. If any cracks have developed in the platform, fill these up with cement mixture. Check if handpump pedestal is firm in its foundation; if loose, inform District Mobile Maintenance Team for corrective action.

### **The District Mobile Maintenance Team :**

The team will undertake, on a regular basis, preventive as well as corrective maintenance of the handpumps in the area. A District Mobile Maintenance Team should look after 500 to 600 India Mark II Handpumps. This means that each hand pump can be checked once or twice in a year for a complete overhaul for above-ground and below-ground mechanism as well as to rectify any shortcomings on platform, drainage and soakage pit.

For preventive maintenance, the District Mobile Maintenance Team should follow the procedures indicated overleaf for the handpump overhaul.

# Step-by-Step Procedure for Pump Overhaul

Before you move out of any handpump site, consult the India Mark II Handpump Installation Manual for checklist of tools and materials, and use this checklist to ensure you have all the tools and materials with you on the vehicle.

When starting the work, ensure that all the tools you will require are within hand's reach to facilitate your work. You can spread out a gunny bag or some other material upon which you can put the tools to protect them from dirt. You should do the same for all the handpump components you are going to remove. Ensure here also that the components are kept off the ground and protected from any dirt. Also, a pipe stand can be used to keep the G.I. pipes and rods off the ground.

## DISMANTLING THE PUMP

1. Remove top-head front cover.
2. Disconnect handle from chain by removing the nyloc nut and bolt.
3. Take out handle-axle. While removing, use axle punch to protect axle threading and remove handle from top-head.
4. Remove top-head flange bolts.
5. Insert one pipe lifting spanner into the holes provided in the top-head and lift top-head (see step 21 of Manual).
6. Fit the connecting rod vice onto the water chamber top flange and tighten.
7. Remove chain and chain lock nut and remove top-head.

8. Remove bottom flange water tank bolts.
9. Lift water tank by using lifter pipe & lifting spanners.
10. Fit heavy duty clamp and tighten, and remove water tank.
11. Disassemble rising main and connecting rods.  
Remove, at a time, three metre lengths only.
12. While removing the pipes and rods ensure that you place these off the ground (see step 9 of Manual).  
Continue doing so until the entire below-ground assembly has been removed from the tube-well.
13. Disconnect cylinder from the last pipe.
14. Check all the pipe threads, clean out the threads by using wire brush. Remove any dirt and rust from the pipes by using sandpaper or wire brush. Re-thread if necessary. If any pipe is damaged, replace. Ensure that all pipe couplings are intact and fit properly.

## **CONNECTING RODS**

15. Check all the connecting rod threads and couplings. Clean out threads with wire brush. Remove any dirt and rust from the rods by using sandpaper or wire brush. Fit lock nuts. If any connecting rod lock nut is missing, replace. Re-thread connecting rods if required. Check each rod for straightness. If rods are bent, try to straighten them. If not possible, replace.

## **CYLINDER OVERHAUL**

16. Unscrew top and bottom reducer caps using heavy duty clamp and wrench. Remove piston assembly and foot-valve. Check piston and foot-valve assembly and replace any worn out components. Replace, if

necessary, leather cup-washers, leather sealing ring, rubber seating etc. Check for cracks which may have developed in the cylinder components. Replace parts if necessary. Assemble complete cylinder assembly.

### **IMPORTANT :**

Check cylinder assembly for any leakage. Put cylinder in a bucket of water and move piston up and down. When cylinder is full of water, hold up and check whether any water is seeping through the foot-valve. If so, re-open cylinder, check piston and foot-valve assembly again for correct assembly and proper tightening. If necessary, replace foot-valve. Lock the upper valve seat and rubber seat retainer of the cylinder by punching at right angle at circumference of mating surface.

### **PUMP BODY OVERHAUL**

17. Clean inside of water chamber and top-head. Remove all dirt and rust inside and outside the handpump body. Use wire brush and/or sandpaper to remove rust patches. Apply anti-rust paint.

Assemble the handpump following the handpump installation procedures, as shown in the Manual.

### **PLATFORM CHECKING**

As you know, the India Mark II Handpump ought to be installed with a proper concrete platform and pedestal. A handpump platform is essential since: (1) it provides the foundation for the pump pedestal; (2) it acts as a

hygienic seal; (3) prevents any surface water percolation into the tube-well and hence excludes any contamination of the tube-well water. Therefore, special attention should be paid to the platform condition and (1) you should check for cracks which may have developed in the platform and (2) check whether the pump pedestal is tightly secured to its foundation.

If the platform has any cracks, or if the pedestal is loose, do the following:

18. Fill up cracks in the platform with cement. Make sure that exposed platform brickwork is covered again with cement plaster.
19. To reinforce the handpump pedestal base, dig out a circular space of minimum 5 cms. wide and 10 cms. deep around pedestal base and fill this up with a 1:2:4 concrete mixture. Whenever cement plaster for concrete mixture is re-applied to an existing platform, curing time should be allowed which is normally 7 days. Disconnect the handle from the chain so that nobody can operate the pump and ask the villagers not to use the hand pump for the duration of the prescribed time. The required setting time can be reduced if quick setting compound is mixed with the cement and concrete mixtures. When quick setting compound is used, 24 hours curing time is required.

## **CHLORINATION OF THE TUBEWELL**

20. Upon completion of the overhaul job, the tubewell should be chlorinated. Follow the chlorination instructions as indicated on page 38 of the manual.

## **REMEMBER**

- No dirt should enter the tubewell while lowering pipes and rods since this may seriously contaminate the tubewell water.
- To clean all the handpump components thoroughly before assembly.
- To tighten all nuts and lock nuts as well as connecting rod couplings and lock nuts and riser pipe couplings.



# Tool Requirements for District Mobile Team

Each District Mobile Team (D.M.T.) should be provided with the following three tool kits :

1. Tool kit for small district level workshop.
2. Tool kit for hand pump repairs in the field.
3. Special tool kit of India Mark II installation and repair tools.

## 1. Tool kit for District Level Workshop

These tools are meant for use at the small workshop to be established at district levels, for reconditioning of handpump components. The GI pipes, connecting rods retrieved from the existing tubewells can be reconditioned : i.e. cutting and/or rethreading (50mm. long at both ends) fitting of pipe couplings, connecting rod couplings and lock nuts. Particularly, the cylinder has to be reconditioned at this small workshop since this requires thorough checking of the entire assembly (for cracks which may have developed on older cylinders; properly fitting good quality leather buckets replacing worn-out parts). The cylinder should be tested at the workshop also against possible leakage of valves. A good number of reconditioned cylinders, pipes and rods should always be kept in stock. The district level workshop is operated by the mobile team members. Alternatively, an extra mechanic could be put in charge of this reconditioning work.

The aim of the workshop is to establish gradually a service exchange system, where reconditioned handpump components are used as "new" items during handpump repairs.

In this way, hand pump repairs in the field will considerably be expedited as well as minimise hasty, and often incorrect, handpump repairs which may result in unnecessary breakdowns necessitating another visit to the same handpump site within a short time-span. The tools are kept at the district level office.

## **2. Tool kit for handpump repairs in the field**

The complete set of tools should always be with the mobile team when handpump repairs are undertaken. The kit comprises of all basic tools required for any kind of handpump repairs.

Although repairs in the field should preferably be kept to the minimum using instead reconditioned handpump components, the set contains some of the similar tools as for the district workshop, enabling the D.M.T. to meet any handpump contingency.

## **3. Special tool kit for India Mark II Deep Well Handpumps**

These tools have been developed specifically for India Mark II installation and repair. These tools will decrease installation time by 70%, simplify the installation procedure, and increase safety.

The kit contains :

<i>Item</i>	<i>Description</i>	<i>Qty.</i>
1.	Combination Lifting Spanner 11¼" to 11½"	3
2.	Pipe Lifter	1
3.	Crank Spanner—17MM × 19MM	2

- |  |   |
|--|---|
| 4. Connecting Rod Vice                                   | 1 |
| 5. Connecting Rod Lifter and Axle Pin Holding<br>Spanner | 1 |
| 6. Handle Axle Punch                                     | 1 |
| 7. Heavy Duty Clamp                                      | 1 |

The tools except 1 & 7 are fitted in a tool box.

# **Tool Kit for District Workshop and District Mobile Team for Installation, Reconditioning & Maintenance of India Mark II Deep Well Handpumps**

## **Standard Tools :**

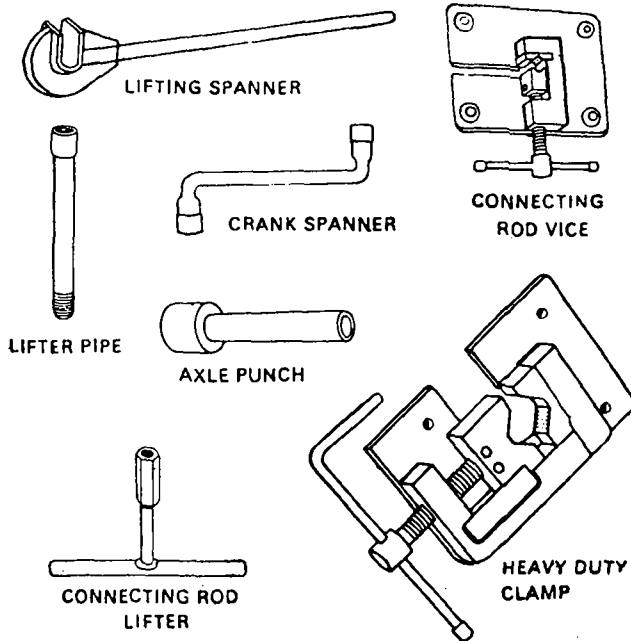
### **ITEM**

1. Pipe wrench 24"
2. Adjustable spanner 12"
3. Open ended spanner 17MM × 18MM
4. Open ended spanner 18MM × 19MM
5. Hacksaw with spare blade 10"—12"
6. Flat file 10" fine
7. Half round file 10" fine
8. Stock & die to cut 1½" BSP or 1½" BSP threads with spare die
9. Stock & die to cut M12 × 1.75 threads with spare die
10. M12 × 1.75 tapset with handle
11. Small screwdriver
12. Large screwdriver
13. Engineer's hammer ½ kg.
14. Spirit level
15. Wire bush & sandpaper.
16. Chisel
17. Tape measure 2 metres
18. Oil can
19. Grease gun
20. Bench vice

## Special Tools :

### ITEM

1. Lifting spanner (3 Nos.)
2. Lifter pipe
3. Crank spanner (17MM×19MM) (2 Nos.)
4. Connecting rod vice
5. Connecting rod lifter
6. Axle punch
7. Heavy duty clamp



There are seven special tools for India Mark II Deep Well Handpumps. These tools should be used by District Mobile Maintenance Teams when installing or repairing India Mark II Deep Well Handpumps.

**TOOL No. 1—LIFTING SPANNER—set of 3 Nos.**

Use to lower or lift the rising main. These Lifting Spanners will not slip or break.

The Lifting Spanners fit both 1¼" BSP and 1½" BSP sizes of pipe.

Use 2 Lifting Spanners to lower or lift upto 30 metres (100 feet) of rising main.

Use 3 Lifting Spanners if the rising main is longer than 30 metres (100 feet).

DO NOT use your pipe wrenches for lifting or lowering the rising main.

**TOOL No. 2—LIFTER PIPE—1 No.**

Use to lower or lift the water tank and rising main together.

1. Remove pump head.
2. Thread Lifter Pipe into top of rising main coupling inside water tank.
3. Grip Lifter Pipe with two or three Lifting Spanners.
4. Lift or lower entire assembly.

**TOOL No. 3—CRANK SPANNERS**

Use a pair of Crank Spanners to tighten or loosen the flange bolts and check nuts, and the chain anchor bolt.

**TOOL No. 4—CONNECTING ROD VICE—1 No.**

Use to clamp the Connecting Rod before you cut or thread the rod. This will avoid bending of the Connecting Rod.

1. Place Connecting Rod Vice on top of flange of water tank.
2. Tighten Vice (Vice has own handle) to grip Connecting Rod.
3. Cut and thread Connecting Rod.

**TOOL No. 5—CONNECTING ROD LIFTER AND  
AXLE PIN HOLDING SPANNER—1 No.**

Use this tool :

- A. *To lift Connecting Rod*, thread tool onto Connecting Rod, then lift upwards.
- B. *To test pumping action*, fit Lifting Spanner handle through the Connecting Rod Lifter, and pump.
- C. *To tighten/loosen axle*, grip axle head between the two flats on the tool and tighten/loosen axle nut with a Crank Spanner.

**TOOL No. 6—AXLE PUNCH—1 No.**

Use to drive axle out of the bearings without damaging axle threads.

1. Remove Axle nut.
2. Fit Axle Punch over threaded end of axle.
3. With a hammer, tap Axle Punch lightly until axle is partially removed.
4. Pull axle out by hand.
5. Pull out Axle Punch.

## **TOOL NO. 7—HEAVY DUTY CLAMP—1 No.**

Use this tool :

- A. To lift or lower rising main pipe.
- B. To open reducer caps on the cylinder body.

Note : Remember to arrange for :

1 tin Jointing Compound, for pipe joints  
1 tin Chassis Grease, to lubricate chain  
1 tin Oil or cutting fluid, for cutting threads  
Cotton waste or cleaning rag

Cement, metal and sand for the platforms.

Tools for the mason : shovel, trowel, bucket, etc.



# Recommended Spares for each India Mark II Deep Well Handpump for Two Years Operation :

## *Spares for Pump Head :*

	<i>Qty. (Nos.)</i>
1. Hexagonal bolts M 12 × 1.75 × 40	12
2. Hexagonal nuts M 12 × 1.75	24
3. Washer M 12	12
4. Hexagonal bolts M 10 × 1.5 × 40	4
5. Nyloc nuts—M 10	6
6. Axle	1
7. Bearing	2
8. Sockets	2
9. Chain with coupling	2
10. Bolt & nut for cover M 12 × 1.75 × 20	4
11. Front cover	1
12. Spacer	2
13. Special washer for axle	2

## *Spares for Cylinder :*

1. Leather cup washer	8
2. Leather sealing ring	12
3. Rubber seating (big)	4
4. Rubber seating (small)	4

## *Spares for Connecting Rod:*

5. Hexagonal coupling M 12 × 1.75 × 50	5
2. Hexagonal nut M 12 × 1.75	10
3. Connecting Rod 12MM dia & 3 metres length	3

*Note :*

—In case of need the following spare sub-assemblies are also available from INALSA

- (1) Conversion head assembly
- (2) Handle assembly
- (3) Water tank assembly
- (4) Pedestal
- (5) Cylinder assembly

# Engineered for excellence— Built for lasting value.

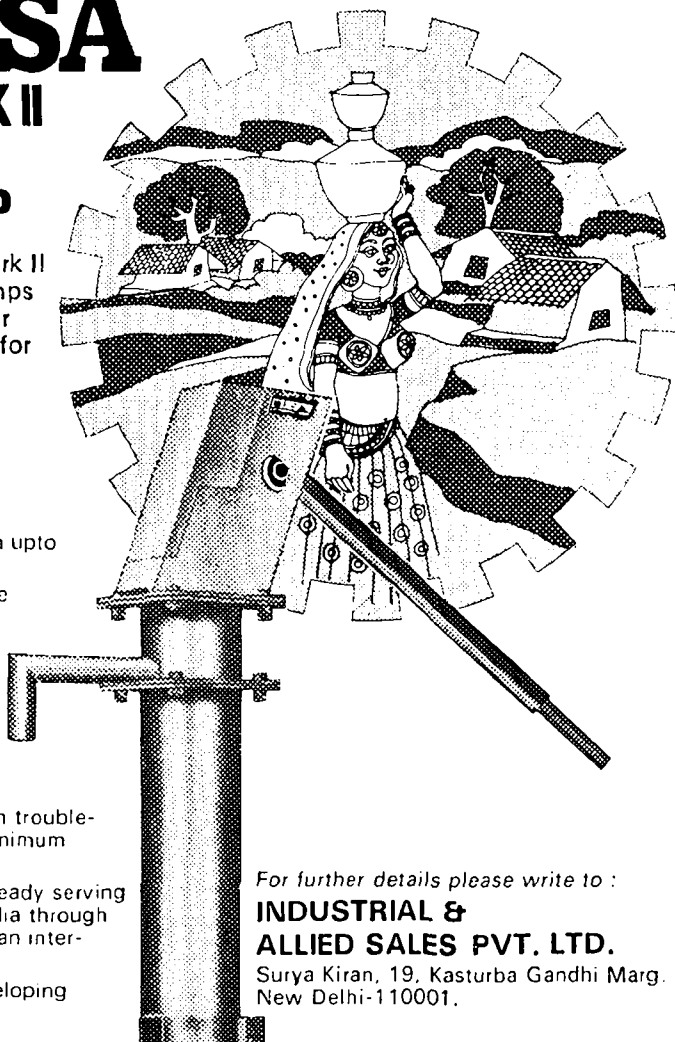
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