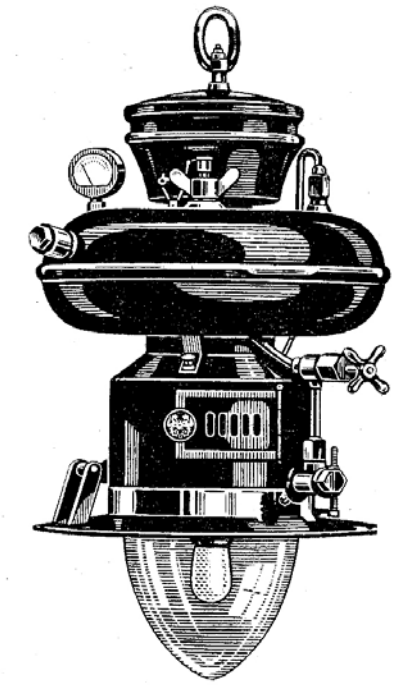


Petromax 834 renovation

As I have restored a reasonable number of Petromax model 834/835 do nut lamps, I want to share my experiences with the reader.

The differences between models 834 and 835 are mainly a matter of size, so my observations apply equally to both. If this is not the case I have made separate notes. There are of course other models that are more or less similar as for instance the Px 790, a 834 with copper tank. But I leave it up to the reader to match the details on his or her lamp model.

The numbers of the parts and in the text refer to the component drawing. In principle these lamps function In much the same way as any other pressure lamp such as for example the Petromax 500 cp model 829.

Important:
These lamps are **kerosene / paraffin** lamps; using them with any other fuel is dangerous!

Main parts of the lamp

The Petromax donut lamps consist of primary and secondary groups of parts:

- Fuel tank
  - Pressure gauge
  - Pump
  - Air / filling cap

- Fuel system (97)
  - Tank
  - (Main) fuel tube with valve
  - Generator spiral with filter
  - Vaporizer

- Mixing chamber (95)
  - Flow regulation
  - Burner head

- Pre heater ring (9)
  - Ignition

- Main chassis

- Sub chassis

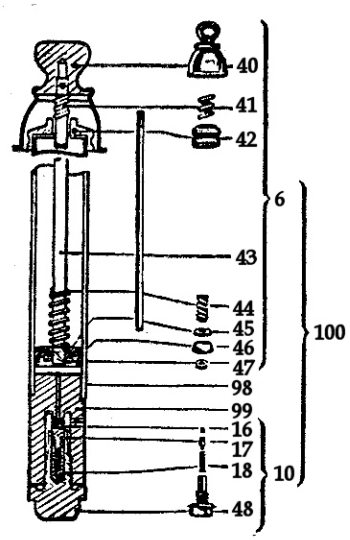
Fuel tank

The fuel tank is made of galvanized steel with three support legs, an air pump, fuel pipe connection, a pressure gauge and filler cap.

To check the integrity of the tank I advise the removal of the old paint. Once this is done any corrosion present can be dealt with and any dents can be filled with solder.
For a good finish I advise a 2-component spray paint or a good car paint.

The three support legs are soft soldered to the tank and should be checked carefully because often rust is formed between the legs and the tank due to a bad or damaged solder connection.

Air pump

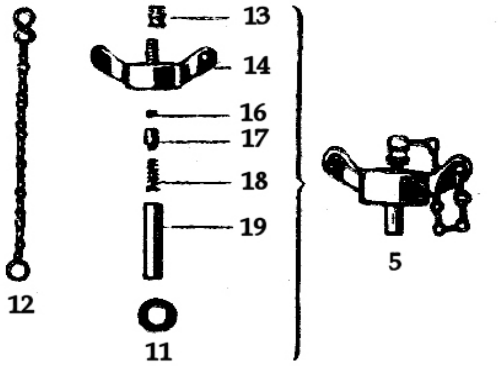


An air pressure pump is mounted in the tank. It is fitted with a clamp to press the spring (41) loaded knob (40) against the pump body. This feature has a minor drawback: because if the pump valve (10) lets escape air pressure from within the tank one can't spot this by observing the movement of the pump plunger.

The pump valve is mounted on the end of the pump tube accessible from outside the tank. This gives easy access to the air valve.
This valve is a difficult one to service, it has to be very clean since the sealing (16, 17) and spring (18) are a close fit inside the valve body (48).

Between the valve main body and the pump body there is no seal. Since the sizes of the parts are the same as a Petromax 500cp lantern these modern parts can be used. Both springs 41 and 44 will give a smooth pump action.

(Air)Filler cap



The filler cap has two functions:
A) To provide a closure to seal off the pressure within the tank
B) To provide an alternative air inlet valve so that the tank can pressurized by using a bicycle pump.

The valve itself (16, 17,18) is of the same size as that of a modern Petromax 500cp lantern pump, part 19 doesn't fit always.

Pressure gauge

The pressure gauges exist in at least three versions.

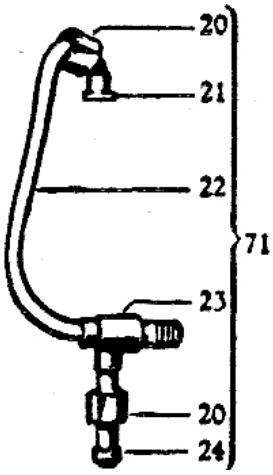
The picture shows two versions, the third one is like the one on the left but has a copper cover to the lower part of the scale inside the glass. So it looks like the one on the right but with a full glass front.
The back of the full glass version can carry the old style (pre 1943) monogram of Ehrich & Graetz.
The text on the scale of left gauge is: PETROMAX Made in Germany, the right has no text on the scale one the front it says : ORIGINAL PETROMAX GERMANY

They are hard to restore unless you know all about pressure gauges and have the right tools.
A clockmaker can remove the indicator from its shaft, then the scale can be taken out.
The gauge then looks like this one:

The beginning and end of the hollow spring are soldered.
These points can be leaking air. Any adjustment or calibration, is not possible.

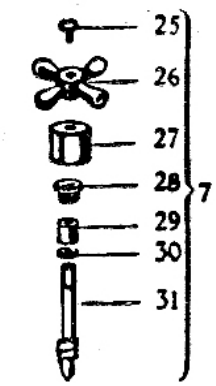
Photo:Willi Springmann

Fuel supply



A tube inside the filler opening of the tank ensures that the tank can only be filled to about halfway. Because of this the tank contains a large volume of compressed air, as a consequence one has to pump up to operating pressure only once. The lamp then will burn until the fuel is consumed.

The air pressure (2 bar or 30 psi) forces the kerosene via a fuel tube from the tank to the burner. This fuel tube (63) contains a small filter at the bottom end. This filter will almost certainly have to be replaced. All the original filters are of a rolled up steel wire gauze and a replacement can be made by rolling up a suitable piece of copper or brass wire mesh or gauze.

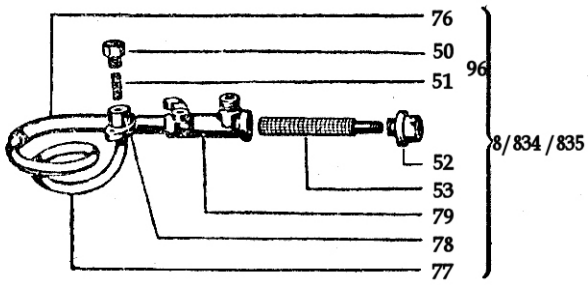


All fuel tubes are fastened by means of conical unions and a union nut without any sealant being used. The fuel tube 63 is held in place by main fuel tube 22. This construction gives more than one connection that has to be air and fuel tight. All the jointing surfaces have to be smooth and clean.

Halfway down fuel tube 22 there is a (main) valve (7) which being a needle valve provides a positive closure. This valve has a packing gland seal (27) and before dismantling the valve you should be certain you are able to replace the packing sealant.
In my experience it is rare for this gland to leak much and normally any leaks here can be contained by tightening the gland nut until any leaks stop and the valve will be just stiff to turn.

When the lamp is in use this valve will be hot and when shutting down the lamp you will close the hot needle valve. After cooling down due to the temperature difference the valve will not open easily.
So before pressurizing the tank and filling the pre heater ring open the cold valve gently because it isn't certain that the valve will open smoothly when hot again.
The best way to clean the old copper and brass parts is to soak them for some hours in "Anti chalk" as used for bath rooms and kitchen sinks.

Generator group



Together with the air mixing tube (95) the generator group 8 forms the heart of the lamp.
Kerosene is fed via fuel tube 22, passes a filter at point 79 and finds its way to vaporizer 96.

This filter (55) has a 15mm long threaded part at the end so it can be unscrewed by means of a special key.

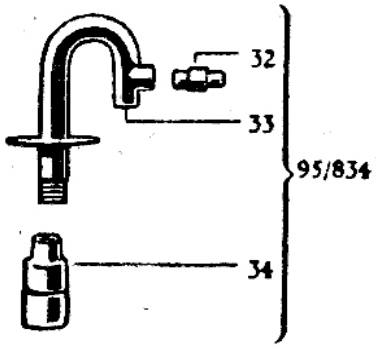
This key is nearly always missing on a second hand lamp. The original thread is 6mm diam., with a 28 Tpi (Threads per inch) pitch and a thread profile of 55^{o}. This is not a standard thread. Like other companies E&G made their own thread. In the appendix there is a drawing of the key and filter with a different more standard thread (M6x1).

Original 200 CP vaporizers (50) are made out of steel and have a slightly hollow top. Also they have a small steel filter gauze inside. Being made of steel they are often rusty and /or worn out. New Petromax 250CP vaporizers will normally fit and a small filter gauze can be made from copper or brass gauze.

These filters have a dual purpose because in addition to providing a filter function they also aid heat transfer within the generator to better vaporize the kerosene.

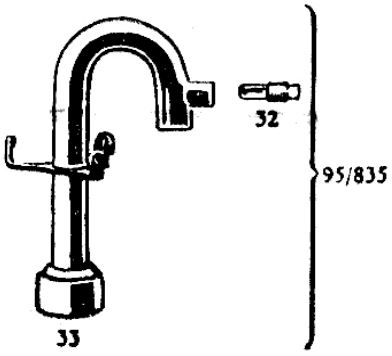
This type of hanging lamp normally doesn't have a pricker mechanism to clean the vaporizer jet so a hand operated pricker is needed. Always make sure the jet is clean before lighting a lamp because once fired up they are too hot to handle.

Mixing tube (95)



The mixing tubes of Petromax models 834 and 835 mainly differ in size and the way they are connected inside the lamp.
Both have a flow adjustment by means of a paddle on screw 32; check the condition of the paddle inside the mixing tube first before turning the screw. If the paddle and position of it looks good leave the screw in place at least until the first run. They easily break or damage when trying to remove them.

The nozzle or mantle carrier mounting (34) of a Petromax model 834 can be found in at least two versions.

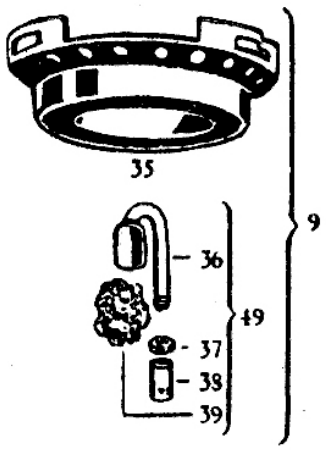


The “old type” and the “new type”.
The old type only accepts old style nozzles. The new types can be fitted with a modern 250cp Petromax nozzle.
The brass mounting (33)can be unscrewed from the mixing tube in both (834) versions.

Petromax model 835 accepts modern 500cp Petromax nozzles.
The brass mounting (33) is fixed on the mixing tube and is not removable.

Since old lamps without globe are frequently placed on the ground sitting ON these parts be sure to check them very carefully.

Pre heating



Pre heating is affected by means of a white enamelled steel circular trough (35) that heats up the vaporizing tube and the generator.
This trough is fastened to the main body by means of three bayonet fittings.

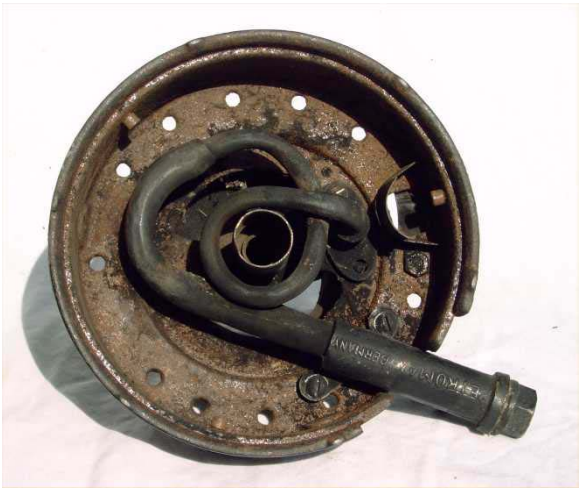
Filling the trough with spirit / alcohol can be done by opening the little door on the lamp and pouring the spirit down a small opening into the trough.

The igniter (49) is fitted to pre-heating trough. This small device fills with spirit and provides a small flame at the lower end (38). This flame ignites the kerosene gasses and so the mantle.

Main-chassis and sub-chassis

I have called the main cast iron body the main chassis. The generator is mounted on this part for instance.
The sub chassis is the enamelled outer case of the lamp.

It is worth noting that the tank is mounted to the sub-chassis which is in turn mounted to the main-chassis with four small screws (5/32 ø 32tpi).
Because the weight of the lamp hangs on the sub-chassis it is important to check these four little screws.



The picture shows an un-restored main body with the small chimney and generator. On the top view (left) on the front one of the small screws is seen as well as the filling opening for the pre heater trough.
In the bottom view (right) the three prongs can be seen for the pre heater trough.

Labels

Some examples of labels that can be found on the lamps.

Photo: Neil McRae

Extra's

I have had the opportunity to make drawings of the extra tools and spare parts that originally were delivered with this type of lamp.
These drawings are in the appendix so you can re-produce them if required.
The main parts list on the following page is from the original manual of the model 834 and 835 but shows a Petromax 836 do nut lamp!

Wim van der Velden – oktober 2004 - Original
Neil McRae (English spelling and grammar) – English version
Erik Leger – oktober 2004 – German Version x