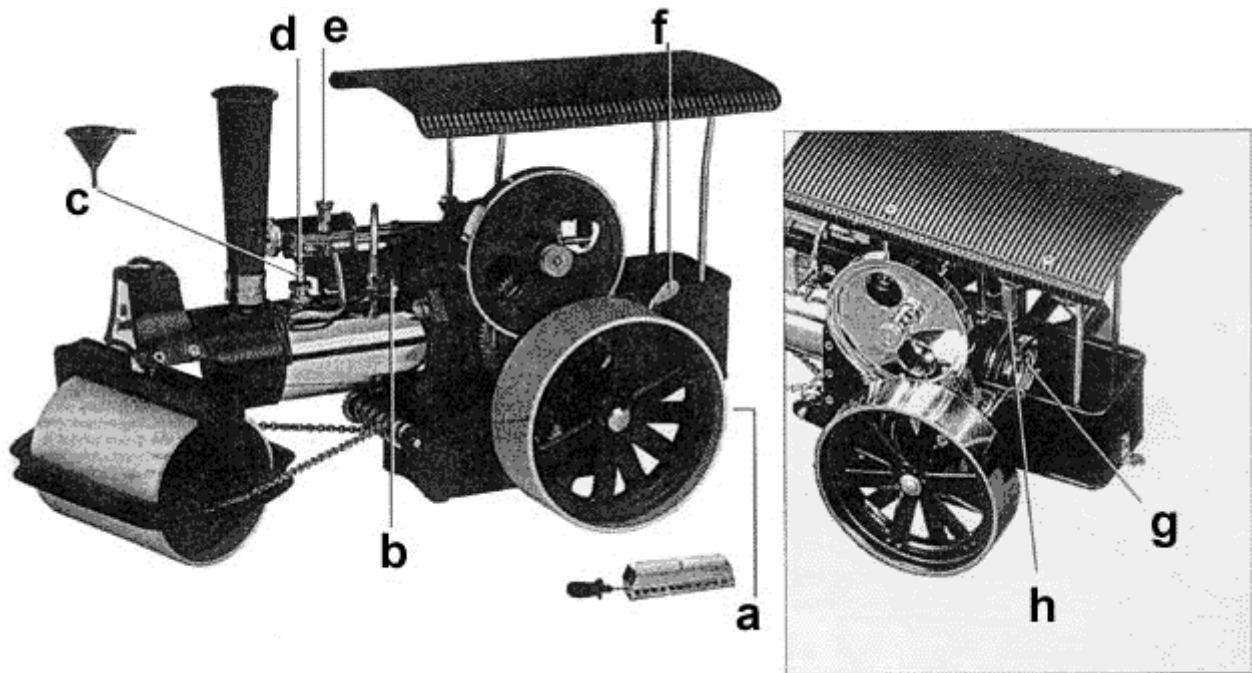


WileSCO D365, D366, D367, D368, D405, D406 D407, D409 Operating Instructions



a) Burner slide
b) Cutout valve
c) Funnel


d) Safety valve (filter cap)
e) Oil cap
f) Clutch

g) Sight glass
h) Steam whistle

Important: Never operate the machine without safety valve! Only use WileSCO steam engine oil. Only use Esbit fuel tablets.




Important information and safety precautions!

1. **For safety reasons, children (recommended age: 8 year and above) should only use the Steam engine under adult supervision.** (Because of steam pressure, hot boiler, hot steam pipes and flames etc.) Do not leave the steam engine unattended either during operation or whilst the engine is cooling after operating.
2. If any problem occurs with the steam engine, the matter should only be dealt with by a distributor or the WILESCO factory. Attempts to repair by other persons will invalidate the warranty.
3. Any alteration to the Standard specification carried out by persons (other than WILESCO Agents) will also invalidate the warranty.
4. Only WILESCO genuine parts or accessories should be used (boiler, spring loaded safety valve etc.) as these have been factory tested. For safety reasons, the spring safety valve must not be adjusted. It is illegal to operate a steam engine without a spring safety valve. Always check the valve for correct operation before use.
5.  **High temperature:** The principles on which your steam engine operates mean that the burner tray, the boiler housing, the spring loaded safety valve, the steam pipes etc. become very hot. Do not touch, in order to avoid the risk of burns!
6. **Safety precautions:** Do not touch - and in particular do not let the children touch - any of the moving parts while the steam engine is in operation.


a)

In the case of an emergency or if the engine has to be moved, the model can be lifted by the roof.

7.  **Do not heat the boiler without sufficient water!** Always ensure that the steam engine has sufficient water in the boiler during operations. Also check the water level carefully when adding new dry fuel tablets. The water **must be visible at the lower end of the sight glass (minimum)**. If this instruction is ignored the boiler will be damaged and has to be replaced. **We will not accept any claims whatsoever, including consequential damage, in this matter.** If a leak occurs in the boiler, or any other part, stop using the steam engine immediately. Any necessary repairs should only be carried out by trained staff, or at the WILESCO factory.
8. The steam engine meets all safety standards and requirements. Every boiler has been submitted to a bursting pressure and water test of 5 bar (approx. 71 psi). Boiler content 240 ccm, operation pressure 1,5 bar (21 psi).
9. Please keep the instructions in a safe place!

Operating instructions:

10. Unscrew the spring loaded safety valve and, using the funnel, fill the boiler approx. $\frac{1}{2}$ full (upper level to the sight glass) with hot water if possible. Raise the funnel slightly when pouring in the water so that the air can escape from the boiler. Use boiled water or rain water if possible (low chalk content).
11. **Note:** The steam whistle can be used to check for any overpressure in the boiler or, before oiling, to check whether the boiler is still under pressure.
12. Close the steam cut-off valve before oiling the cylinder. The valve is closed when the lever is below approx. 45Deg pointing backwards (towards sight glass) and open when the lever is below approx. 45 Deg pointing forwards (towards smoke stack). Now unscrew the oil filler screw and fill with WILESCO steam engine oil or car engine oil while turning the flywheel several times so that the oil is drawn in. Oil frequently so that the piston does not seize. 2-3 drops of oil are sufficient for approx. 10 minutes operating time. For safety reasons the steam cut-off valve must be closed when oil is being added. There must not be any steam pressure in the boiler. Lightly oil all the bearings and linkages. Before refilling the boiler with water, the pressure in the boiler has to be released by opening the steam whistle.

13.  Place two layers of ESBIT fuel tablets in the burner slide, the lower tablets flat and the upper tablets on their sides. Then light the tablets. Never use more than 4 fuel tablets at a time. use only the original WILESCO burner slide. **Caution: Because of the risk of danger from an open flame, always take the necessary safety precautions.** The burner slide is adjustable. The oxygen supply and the flame height can be adjusted by moving the burner slide in relation to the air holes (see illustration). Before adding new fuel tablets always check the water level and refill the boiler with water to ensure that the boiler does not run dry. The ratio of fuel tablets to the amount of water in the boiler is designed so that the boiler cannot run dry without fuel tablets being added. The fuel slide must be completely pushed in. **Important:** After completing the heating process, **remove the burner slide from the guide whilst it is still hot**, otherwise unburned fuel may cause the slide to jam. If the slide becomes jammed, it can be removed by tilting it slightly to the left or right. Widen the guide slightly using a standard pair of flat pliers.



Note: ESBIT tablets require plenty of oxygen to burn properly. **This means if used indoors the room should be well ventilated.** To prevent unpleasant smells, the fuel tablets should be allowed to burn out - they should not be blown out. If there is insufficient

water in the boiler, place the burner slide on a metal plate until the tablets have burned out completely.

14. Disengage the gears next to the driver cab, by moving the clutch lever sideways. When the water starts to bubble - open the steam valve and turn the flywheel by hand, so that the condensation in the pipe and cylinder can escape. Engage clutch and put steam engine into operation, by gently spinning the flywheel. The flywheel can be started-up in either direction, which enables forward and reverse movement. The speed can be adjusted by means of the steam stop valve.
15. The exhaust steam which does not escape through the chimney collects as water-oil-condensation in the container under the chimney, which is why the steam pipe is not soldered, since no pressure develops in the condensation container (separate from the boiler). After using, remove the chimney and remove the condensation through the chimney hole, by shaking lightly.
16. The Steam Roller (and Traction engine) can, with the clutch disengaged, be used as a stationary steam engine. By using the belt drive on the flywheel, the WILESCO range of driving models can be operated. When the Steam Roller is used without steam - the clutch must always be disengaged.
17. After use, remove any water left in the boiler. **Be very careful if the water is still hot!** Any water left in the boiler cannot do any damage, but might leave sediment on the sight glass. Any soot formation on the lower surface of the boiler can be removed with a brush, e.g. an old toothbrush. Finally, dry the model using a clean cloth. **Never** remove chalk residues on the sight glass with vinegar.

Warranty:

18. Finally, a few comments on the warranty. All WILESCO steam models are carefully checked before leaving the factory. However, if a problem arises, we will be happy to assist, or carry our repairs. You can return the steam engine directly to WILESCO or to the distributor. **We are sure you will appreciate fired models cannot be exchanged, but we undertake to repair any fault.** The above information has been given for you to obtain the maximum enjoyment from your steam engine WILESCO wishes you lots of fun, and full steam ahead -

Remote control is available for fitting to the steering wheel of the Steam Roller and Traction engine, the part no. is **Z361** and can be ordered via your WILESCO retailer.

Only for Brass Steam Roller and Steam Traction Engine

All parts are solid brass, with the exception of the flywheel and steering wheel, these are brass plated only, to facilitate manufacture. Working models of the steam traction engine (D405) and steam roller (D365) are protected against tarnishing by the application of a clear lacquer. In use the protective coating will be removed from the very hot parts making it necessary to clean and re-spray should one wish to retain the original high quality finish.

Only for SHOWMANS ENGINE D 409

The illumination set consists of 8 diodes fastened onto rigid conductor plates which carry the current. Thy dynamo which is mounted on the top supplies direct

current, so the diodes will only light up when the flywheel turns in one direction, i.e. when the steam traction is moving forwards. The wires are connected as follows: black wire to the lower terminal, red wire to the upper terminal. When the steam tractor is operating but **not** moving forwards, it is important to ensure that the flywheel is turning in the correct direction. If you want the diodes to light up when the steam tractor is travelling backwards, simply switch the wires round at the terminals i.e. black to the upper terminal and red to the lower terminal when reversed.

The Functioning of the Original Steam Engine

The driver of the steam engine or stoker shovels the coal through the stocking door into the boiler. The coal is being burnt.

The boiler/firing chamber is supplied with fresh air via the air supply from underneath. The combustion air which is heated to high temperatures moves from the boiler through the steam tubes of the boiler (water tank) into the combustion chamber and from there to the chimney. This is how the steam pressure which accumulates in the enclosed boiler is transferred in the cylinder into motional energy. The exhaust steam (condensation) is led via the exhaust into the chimney. The evaporated water is replaced by fresh water from the cold water tank. The motion of the piston rod is transferred by means of the crankshaft and the gear wheels onto the large rear wheels. Every steam engine has, as opposed to a steam locomotive, a large flywheel.

The flywheel is needed in order to overcome the dead centre of the piston in the cylinder and serves also as energy storage to absorb load surges. In contrast to the steam engine the steam locomotive has two or more cylinders whereby the offset piston arrangement overcomes the dead centre and for that reason a flywheel is not required.

The WILESCO steam engines/traction engines work on the same principal as the old originals. However, instead of burning coal or coke a dry fuel tablet is used to heat the boiler.

The Energy Transformation in the Cylinder

The diagrams on the right show what actually happens inside the power converting system (piston and cylinder) when steam and water are brought together to produce mechanical energy, energy to drive a drilling machine, a saw, locomotive or steam roller.

In the first diagram the steam can be seen passing to the left side of the piston, pushing the piston to the right. At the same time the exhaust steam from the previous stroke is directed, by the other port on the slide valve, out into the atmosphere, having done its useful work.

Just before the piston reaches the end of its travel, on the extreme right, the slide valve cuts off the steam from the boiler. This is the point, where the crank is at the limit of its movement and is known as top-dead-centre or bottom-dead-centre referring to the two possible geometric positions. The flywheel carries the crank

over this critical position by the energy it has stored from previous power strokes.

The slide valve continues to move in the same direction this time opening the inlet port to admit steam to the right hand side of the piston, again pushing the piston but now to the left, exhausting the steam through the left hand port. The whole cycle being repeated when the dead centre • is reached once more.

Text & illustrations: Wilesco Wilhelm Schroder GmbH & Co., Germany