

# Allis Chalmers

## Operator's Manual

## 18-30



Operator's Manual



**AC-O-18-30**

INSTRUCTIONS

ALLIS-CHALMERS

# 18-30 Tractor

No. 1308-A



Allis-Chalmers Manufacturing Co.
MILWAUKEE,
WIS.

## DESCRIPTION OF 18-30 OILING SYSTEM

THE motor is provided with a pressure feed system of lubrication. Oil is pumped under pressure to the crankshaft and connecting rod bearings, piston pin bushings, and timing gears.

The oil sump is filled with approximately 3 gallons of lubricating oil. A gear pump, driven by gears from the crankshaft, is located so low in the oil sump that it need not lift the oil by suction.

Before entering the pump the oil passes through a screen which prevents dirt and other foreign substance from getting into the pump. All dirt goes to the bottom of the oil sump and from there it may be removed by taking off the oil sump cover.

The pump delivers the oil through a manifold or distributor pipe to the three crankshaft main bearings and to the timing gears in the front part of the motor. From here the oil passes through drilled channels in the crankshaft to the connecting rod bearings. From these bearings a portion of the oil is fed to the piston pin bearings through a pipe fastened to the side of the connecting rods. The other portion of the oil comes out at both sides of the connecting rod bearings and is thrown off, oiling the cylinders, camshaft, and valve tappets. Oil is also thrown off from the cheeks of the crankshaft after it has passed through the crankshaft main bearings.

After lubricating all moving parts of the motor in this manner, the oil returns to the oil sump to start a new cycle.

INSTRUCTION BOOK

# ALLIS-CHALMERS
# 18-30
# TRACTOR



ALLIS-CHALMERS MFG. CO.
Milwaukee, Wis.

# Index


| | Page |
|---|---|
| Air Washer | 15 |
| Brake | 25 |
| Carburetor | 13 |
| Cooling System | 17 |
| Carbon in Cylinders | 33 |
| Clutch | 21 |
| Connecting Rods | 9 |
| Connecting Rod Bearings | 9 |
| Crank-Shaft | 11 |
| Crank Shaft Bearings | 11 |
| Fuel System | 13 |
| Governor | 17 |
| Ignition | 17 |
| Lubrication | 5 |
| Motor Lubricating System | 19 |
| Magneto Timing | 25 |
| Manifolds | 13 |
| Motor | 7 |
| Operating | 25 |
| Pistons | 9 |
| Pulley | 25 |
| Radiator | 17 |
| Shifting Gears | 23 |
| Spark Plugs | 31 |
| Steering Gear | 25 |
| Transmission | 23 |
| Trouble | 29 |
| Valves | 11 |
| Setting | 11 |
| Grinding | 11 |
| Plate No. 1—Left side of Tractor | 6 |
| Plate No. 2—Rear view of Tractor | 8 |
| Plate No. 3—Right side of Tractor | 10 |
| Plate No. 4—Front view of Tractor | 12 |
| Plate No. 5—Magneto side of Motor | 14 |
| Plate No. 6—Carburetor side of Motor | 16 |
| Plate No. 7—Bottom view of Motor | 18 |
| Plate No. 8—Crank case Bottom | 20 |
| Plate No. 9—End Sectional view of Motor | 22 |
| Plate No. 10—Control | 24 |
| Plate No. 11—Transmission | 26 |
| Plate No. 12—Clutch | 28 |
| Plate No. 13—Motor Cylinder Heads Removed | 30 |
| Plate No. 14—Sectional Drawing Governor | 32 |

# Directions for Lubricating Motor and Transmission of Allis-Chalmers 18-30 Tractor

Lubrication is the most important thing in the care of a tractor.

Always remember that oil is cheaper than repairs.

Be sure that no dirt gets mixed with the oil.

Use the kind of oil specified on page 7.

Before pouring oil into the motor see to it that the tractor stands approximately on the level, sidewise. Open upper one of the two pet cocks on oil sump of motor. Unscrew covers on filler pipes and fill in oil through the filler pipes of motor inspection plates until the oil begins to flow out of the open upper pet cock. It takes about 3 gallons of oil to fill to this level. The oil cans used for filling in oil should be protected against dust and dirt and should be cleaned frequently. Also be sure no dirt enters with the oil from any other source.

As soon as motor is started see whether the oil gage shows pressure. If not, open pet cock in oil manifold on side of motor. In case oil squirts out of this pet cock, the oil gage is out of order and should be repaired, but otherwise the oiling system is in working order. If no oil squirts out, the motor should be shut down immediately. The trouble may be that the screen next to oil pump or the oil piping is clogged up and needs cleaning.

Open lower pet cock in oil sump at least twice a day to see whether there is still a sufficient amount of oil left.

In cold weather a light oil should be used, see list Page 7.

The **governor** must be supplied with oil separately. Use the same grade of oil in governor as in the motor. Carry this up to pet cock level, filling the governor casing every two days. (See plate No. 14.)

The **fan** should be oiled once a week with a good heavy oil, same as used in the motor.

Cylinder head covers should be removed at least once a week and rocker arms given a thorough oiling at which time the tappet adjustments should be gone over to see that they are still properly set; see "Wearing of Valves." Page 11.

**Rocker Arms** should be well oiled once each day through the two oiling cups which you will find on top of cover.

Drain the oil from oil sump after every twenty hours running, clean the screen, wash out the oil sump with kerosene and fill it with fresh oil to the level of upper pet cock.

Keep oil level in transmission casing up to pet cock located on left side of tractor.

When using tractor for belt work in cold weather keep oil level in transmission case one inch higher than the usual height. This will take approximately 2¼ more gallons of oil. This extra oil should be the same

as used in the motor. By this means the oil in the transmission case which has become thickened by the cold will be thinned and therefore flow more readily.



## OILS RECOMMENDED

| MOTOR | | TRANSMISSION |
|---|---|---|
| Summer | Winter | |
| Mobiloil BB | Mobiloil A | Mobiloil C |
| Texaco C | Texaco D | Texaco 566 |
| Veedol Special Heavy | Veedol Special Heavy | Sun Transmission Oil |
| Sun Tractor Oil | Sun Tractor Oil | Sinclair Transmission Oil. |
| Sinclair Liberty Aero Oil | Sinclair Motor Oil Extra Heavy | Whitmore No. 7 |
| National Motor Oil Extra Heavy Enarco | National Motor Oil Heavy Enarco | Gredag No. 41 |

### REAR WHEEL DRIVE GEARS

Texaco Crater Compound
Whitmore No. 45.
Sinclair Onyx Heavy Lubricant
Gredag No. 44

## TRACTOR MOTOR

The power plant of the Allis-Chalmers 18-30 Tractor consists of a four stroke cycle type, four cylinder, vertical motor of our own manufacture and is especially designed and constructed for the use of kerosene.

The cylinders are 4¾ bore, and the stroke is 6½. The motor is cast in block and is of the valve-in-head type, that is, both exhaust and inlet valves are located in the cylinder heads. There are two cylinder heads, each covering two cylinders. They are easily removable for inspecting of cylinders and valves. Copper gaskets between cylinder block and heads insure a tight joint. (See plate No. 13).

The cylinders proper are separate castings inserted in the block and can be replaced when worn or damaged.

The motor is of the four stroke cycle type, that is, it takes four strokes of the piston to complete one cycle of the motor performance.

The first stroke is the **suction** stroke. The piston moves down, drawing the charge consisting of a mixture of fuel and air into the cylinder. The inlet valve is open and the exhaust valve is closed.

The second stroke is the **compression** stroke. The piston moves up compressing the charge. The inlet and exhaust valves are closed. Normally the charge is ignited near the end of this stroke by means of an electric spark.

The third stroke is the **expansion** stroke. The piston is forced down, by the ignited charge expanding and exerting pressure on the piston. This pressure is transmitted by the connecting rod to the crankshaft of the motor, which in turn by means of the friction clutch and gearing propels the tractor or drives the pulley. The inlet and the exhaust valves are closed.

The fourth stroke is the **exhaust** stroke. The piston moves up forcing the burnt gases out of the cylinder through the exhaust valve. The inlet valve is closed and the exhaust valve is open.

Numbering the cylinders of the motor from 1 to 4 and counting the cylinder next to starting crank or front end of tractor as No. 1, the firing order of the cylinders is 1-3-4-2 that is, the expansion or power stroke occurs successively in cylinders 1-3-4-2.

From the above it follows that there is an expansion or power stroke every half revolution of the crankshaft. To have this take place in proper order, the camshaft operating the inlet and exhaust valves, and the magneto connected by cables to the spark plugs, must be timed correctly in relation to the crankshaft; that is, each valve must open and close and each spark plug must fire, when the crankshaft and the relative piston are passing through the right position for proper operation.

The camshaft and the magneto are driven from the crankshaft through the timing gears which are meshed so as to accomplish these results.

A heavy flywheel is fastened to end of crankshaft, which equalizes the torque of the motor and serves as the clutch housing.

## PISTONS

The pistons are light iron castings, each having three piston rings.

## REMOVING PISTONS

To remove piston from cylinder for inspection of piston rings, take off oil sump and connecting rod cap, then piston can be taken out past crankshaft, or the cylinder head may be taken off and pistons taken out through top after removing connecting rod caps. (See plates No. 7 and 13.)

When piston rings are worn or carbon causes rings to stick so that compression is reduced, the rings should be removed as follows:—Use three or four pieces of tin about ½″ wide placing them between rings and piston. The rings can then be slipped off, starting with the top ring. They can be replaced in the same manner, or new rings put in, if the old ones are worn too much.

Be sure and clean out carbon deposits in the grooves before replacing rings.

## CONNECTING RODS

Connecting rods are carbon steel drop forgings. Their upper ends are bronze bushed for the piston pin bearings. Their lower or crankshaft ends have bronze babbitt-lined shells.

## CONNECTING ROD BEARINGS

The connecting rod bearings should be examined carefully at frequent intervals for looseness and wear. Do not wait for your bearings to knock but examine them often. Examination of bearings can be made by removing inspection plates on side of engine. To detect a looseness in bearing move connecting rod up and down with the aid of a stick used as a lever.

If bearings are loose tighten them immediately. This is done by removing oil sump on bottom of crank case. From there bearings are easily accessible. Take cotter pins out of bolts and tighten up nuts first and then test, but if play still remains, take off bearing cap and remove as many shims as necessary to take up the play. These shims are made of different thicknesses, and perhaps one fine shim on one side will be all that

Cut No. 16516

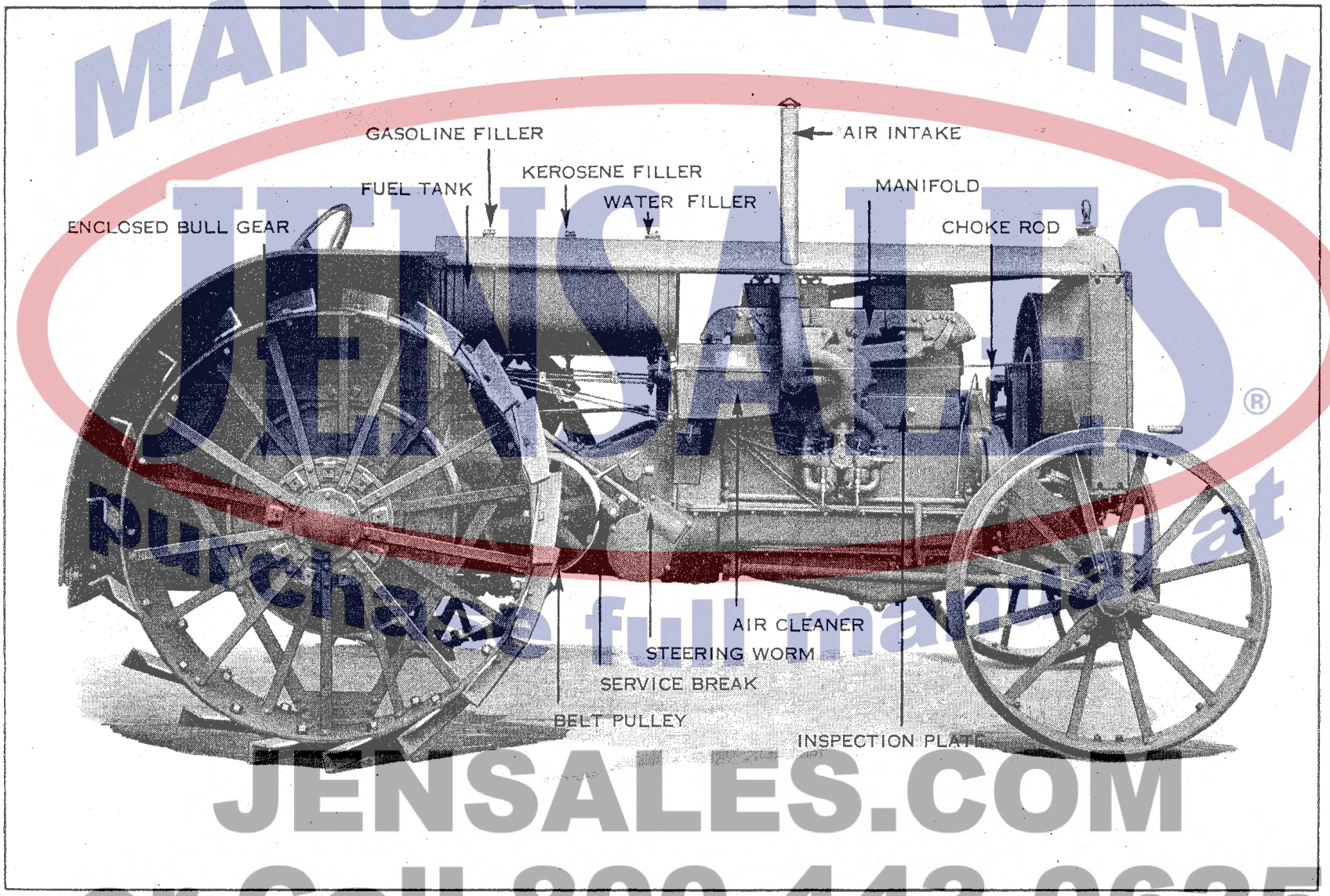


PLATE No. 3.
RIGHT SIDE OF TRACTOR