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MANUAL PREVIEW

Fairbanks-Morse

Operator's Manual

Jack of All Trades

2, 3, 4, 6, 9 & 12 H.P.

Vertical Engine

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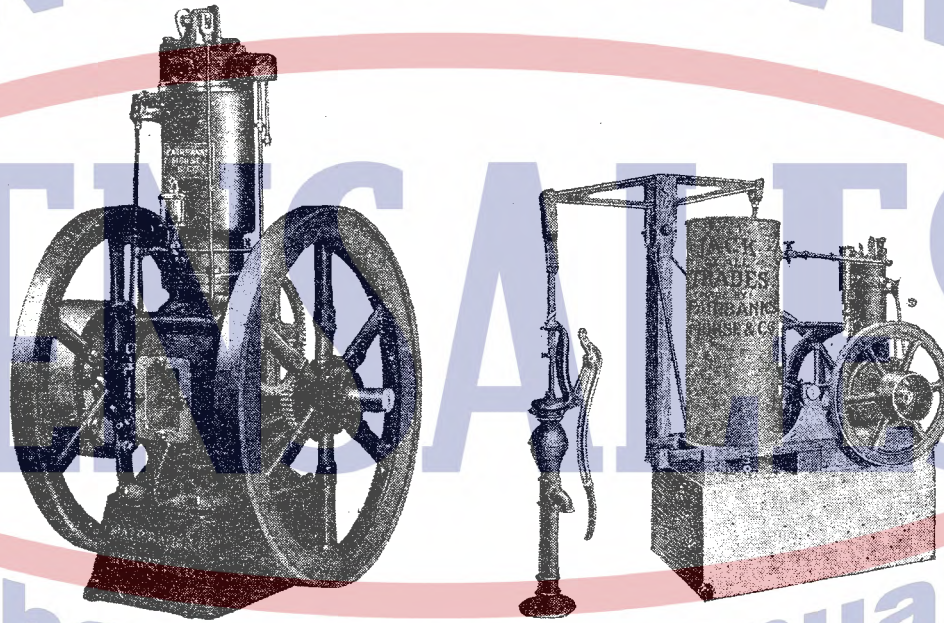
FM-O-JOAT

Operator's Manual

INSTRUCTIONS FOR SETTING UP AND OPERATING

FAIRBANKS-MORSE

Vertical Gas, Gasoline
and Kerosene Engines



Jack of all Trades and 2, 3, 4, 6, 9 and 12 H. P.
Vertical Engine

Fairbanks, Morse & Co.

Chicago, Ill.
Detroit, Mich.
Cincinnati, Ohio
Cleveland, Ohio
Indianapolis, Ind.
Bakersfield, Cal.
New York, N. Y.

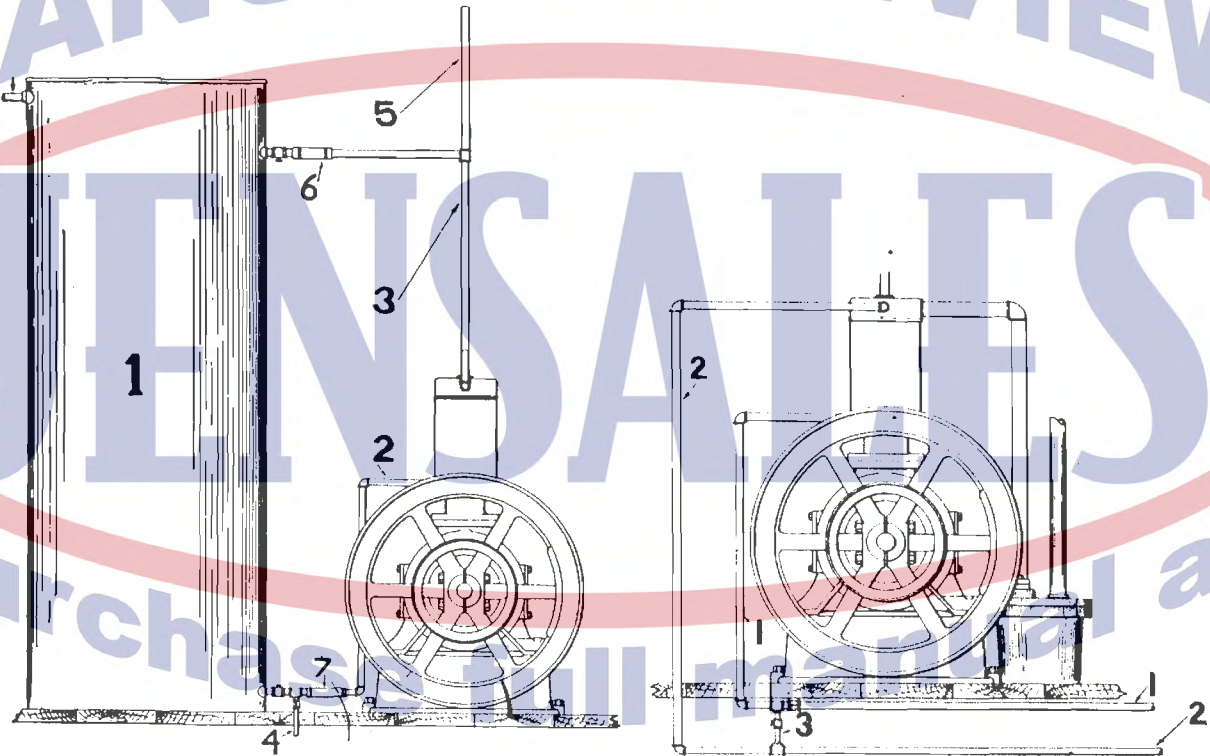
St. Louis, Mo.
St. Paul, Minn.
Louisville, Ky.
Minneapolis, Minn.
Kansas City, Mo.
Spokane, Wash.
Seattle, Wash.
London, England

Omaha, Neb.
Denver, Colo.
San Francisco, Cal.
Los Angeles, Cal.
Salt Lake City, Utah
Portland, Ore.
Santa Maria, Cal.

Freezing

mosphere, and so arranged that the water can be drained from cylinder and connecting pipes, to prevent freezing and bursting in cold weather. Be sure to leave open end of pipe (5) over cylinder high enough to be above water in tank. In operation, the water must always be above the upper pipe in the tank, otherwise the water cannot circulate.

The water circulation will be much better if the cooling tank can be elevated at least enough to bring the bottom above the lower water opening on the engine cylinder. We advise doing this where possible as the power of the engine will be slightly increased by this improved circulation. If the tank is not set close to the engine one size larger pipe should be used between the tank and the engine.



Showing Water Connections Using Circulating Tank.

- | | |
|----------------------|----------------------|
| 1. Circulating Tank. | 4. Drain Pipe. |
| 2. Supply. | 5. Vent. |
| 3. Return. | 6, 7. Hose Coupling. |

Showing Water Connections Using Running Water.

- | |
|--------------------------|
| 1. Supply (From Main). |
| 2. Discharge (To Sewer). |
| 2. Drain Pipe. |

Running Water

If running water is used, place a globe valve in the inlet pipe close to the engine, to regulate quantity of water admitted to the cylinder. Water flowing from cylinder should be from 160 degrees to 180 degrees Fahrenheit.

Exhaust Pipe.

The exhaust pipe from engine to exhaust pot is always shipped fitted for connecting up with the pot.

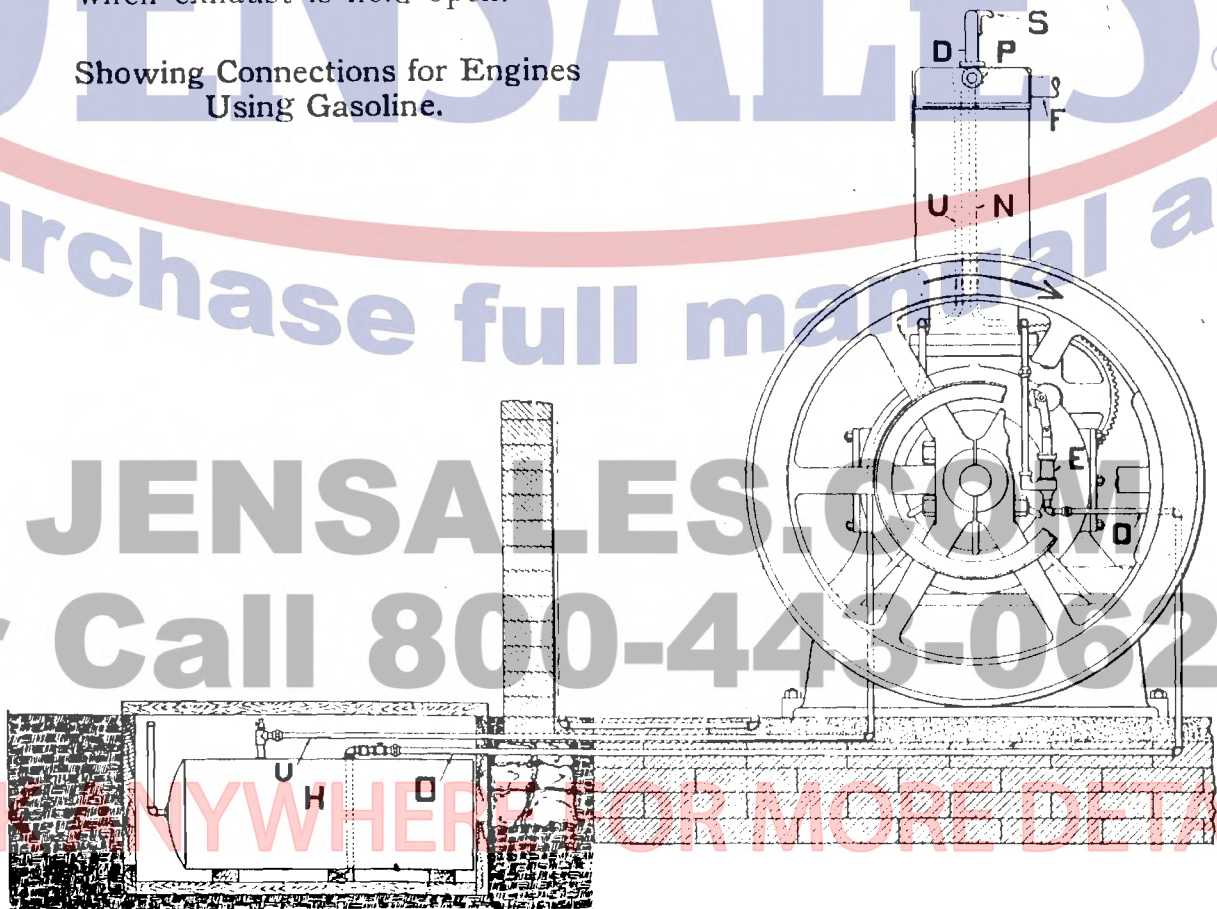
The long nipple which is threaded at one end only is to be placed

Description and Instruction as to the Action and Care of Parts of the Engine.

Inlet or Mixing Valve. See page 6.

This is an ordinary check valve, automatic in its action, and has a lift of three-eighths of an inch. The lift is limited by means of a spring on the stem of the valve and a cotter pin through the nut on stem. Should this pin ever need renewing, care must be taken that the new pin is no longer than the original one, for if longer the ends will strike the side wall of shield and the working of valve will be interfered with. The collar nut must be so set as to hold valve closed when the catch is down, as is the case when the engine is governing. Should the engine at any time on starting turn too easy, or have lost the usual compression, it is evident that a leak is taking place, and this valve should be examined; it may not seat perfectly. This valve can be examined by taking out the screws and removing the casting (D), (see page 6). This will expose valve-stem, when by working this valve you can tell whether it works free, and by means of a wrench on the stem the valve may be revolved backward and forward, in this way cleaning the seat. On again putting the parts together care must be taken that they are not twisted, and that they do not bind the valve-stem. Look at this very carefully. Also see that catch works free and locks valve, preventing all movement when exhaust is held open.

Showing Connections for Engines
Using Gasoline.



REPAIR LIST OF 2, 3, 4, 6, 9 AND 12 H. P. VERTICAL ENGINE.

No.	DESCRIPTION.	No.	DESCRIPTION.
ENGINE CYLINDER ON BASE.		43	Governor Spring Eye Bolt and Nuts.
1	Cylinder.	44	Governor Sleeve.
2	Bearing Plate.	45	Detent Catch.
3	Crank Shaft Brass Bushing.	46	Detent Roller.
4	Hand Hole Plate.	47	Detent Catch Fulcrum Pin.
5	Hand Hole Plate Stud.	48	Taper Pin in No. 47.
	Hand Hole Plate Stud Nut.	49	Detent Spring.
6	Bearing Plate Stud.	50	Detent Spring Eye Screw.
	Bearing Plate Stud Nut.		
7	Base.	SUCTION VALVE.	
CYLINDER HEAD.		54	Suction Valve.
9	Cylinder Head.	56	Suction Valve Nut.
10	Cylinder Head Stud.	57	Cap over Suction Valve.
	Cylinder Head Stud Nut.	58	Suction Valve Lock Catch.
		59	Suction Valve Lock Catch Pin.
		60	Suction Valve Lock Catch Spring.
		61	Suction Valve Spring.
CRANK SHAFT AND FLY-WHEELS		EXHAUST VALVE.	
12	Crank Shaft.	65	Exhaust Valve and Stem.
13	Fly-Wheel.	66	Exhaust Valve Spring Washer.
	Fly-Wheel Bolt.	67	Exhaust Valve Spring.
	Fly-Wheel Bolt Nut.	69	Exhaust Rocker Bracket.
	Fly-Wheel Key.	70	Exhaust Rocker Pin.
14	Pulley.	71	Exhaust Rod and Nut.
	Pulley Bolt.	72	Exhaust Cam Roller.
	Pulley Bolt Nut.	73	Exhaust Rocker Lever.
15	Starter Crank.	74	Exhaust Rod Ear Joint.
16	Starter Crank Pawl.	75	Detent Pin.
17	Starter Crank Pawl Rivet.	77	Exhaust Rocker Arm.
18	Starter Crank Handle.	78	Exhaust Rocker Arm Pin in Base.
19	Starter Crank Handle Bolt.	79	Rocker Arm Washer.
20	Starter Crank Handle Bolt Nut.	81	Ear Joint Pin.
	Starter Crank, complete.		
CONNECTING ROD, BRASSES AND PISTON		ELECTRIC IGNITER.	
25	Connecting Rod.	85	Igniter Body.
26	Connecting Rod Bushing, crank end.	86	Ignition Studs in Cylinder.
27	Connecting Rod Bushing Cap.		Igniter Stud Nut to Cylinder.
28	Connecting Rod Stud.	87	Igniter Fixed Electrode.
	Connecting Rod Stud Nut.	88	Thumb Nuts on Fixed Electrode.
29	Connecting Rod Bushing, piston end.	89	Igniter Collar and Fixed Electrode.
30	Piston.	90	Igniter Mica Washers.
31	Piston Pin.	91	Igniter Movable Electrode.
32	Piston Pin Set Screw.	92	Catch on Movable Electrode.
33	Piston Ring.	93	Spring on Catch.
		94	Eye Screw for Spring.
GOVERNOR DETENT CONNECTIONS.		95	Stop Collar on Movable Electrode.
39	Governor Weight.	97	Spiral Spring around Collar.
40	Governor Weight Pin.	98	Igniter Rod and Nut.
42	Governor Spring.	99	Igniter Pawl.
		100	Igniter Pawl Block.
		101	Igniter Pawl Pin.
		102	Igniter Pawl Spring Stud.

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Inlet and Exhaust Valves.

Valves Be sure that these valves are working properly. In turning the engine by hand, if compression is strong, the valves are all right. After the engine has been standing some time it is advisable to insert a wire nail in the small hole drilled in valve case and lift the suction valve off the seat to insure its working free.

Gaskets If necessary to put in any new gaskets, be sure to soak the gasket in boiled linseed oil. This will insure a tight joint, whereas if gasket is put in dry, it is more liable to blow out.

Clean.

Connections to reservoir are provided with a fine wire screen located in union close to reservoir to stop any foreign substances from entering reservoir. A wire screen is also attached to end of suction pipe in gasoline tank. These may become clogged and require cleaning.

Lubricating Oil.

Never start engine without having first oiled all parts well with hand oil can, and see that there is plenty of oil in the cups on cylinder and journal of the large gear. Use a mineral oil (preferably Standard Gas Engine Oil, made by the Standard Oil Co.)

With these conditions the engine is sure to work satisfactorily. The oil used for lubricating the piston must be strictly mineral oil, free from vegetable or animal matter, of a high fire test, and fluid enough to be fed by the oiler. Steam engine cylinder oil is too thick.

Oiling.

On one of the feet at the bottom of crank case are two oil plugs. The lower one, opening horizontally, is to drain the crank case; and the upper one opening vertically is for filling. Oil should be put in until the ends of the connecting rod bolts C C (see cut) will just touch it. This can be seen by taking off the hand-hole plate and turning the crank down. Before replacing, note how high the oil rises in the filling opening E, and it will not be necessary to remove the plate again when filling.

A sight feed oil cup fitted to the lower part of the cylinder constantly supplies the oil wasting from the base so it will very seldom be necessary to pour in oil through the oil plug as described above.

Fill the oil cups on bearings and oiler on side of cylinder and regulate the amount of oil feeding out.