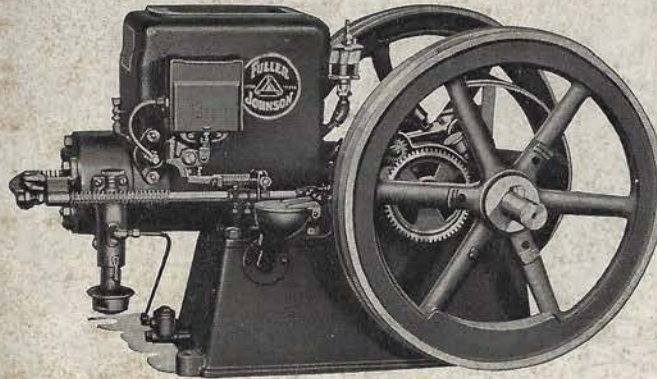


Operating Instructions and Spare Parts List

FULLER & JOHNSON

4 H. P. and 6 H. P. Model "NB" Gasoline Engines



Effective July 20, 1927

Terms Cash With Order.

PRICES ARE F. O. B. MADISON, WIS.

All Prices subject to change without notice

To enable us to fill your orders for repairs promptly and correctly, it is absolutely necessary that you:

Give engine number and horsepower found on name plate.
Give symbol number and name of part.
Give name of railroad or express station, if different from your post office address.
State how to ship, whether by mail, express or freight.
Write your name and address plainly.

Read Carefully

A1. Each Fuller & Johnson engine is carefully built, thoroughly tested and rigidly inspected, and the engine leaves our factory in first class running condition. Therefore, you should leave the adjustments as they are set at the factory. Read the instructions and be sure that you understand the operation of each part. FOLLOW THE DIRECTIONS.

Foundation and Location

B1. For the best results the engine should always stand as level as possible. Keep the engine free from dirt.

Before Starting

C1. Study the information given in the illustrations, and in reading the instructions, where a reference is given, be sure to refer in every case to the illustration. If at the same time you will examine the part on the engine it will help you to become familiar with your engine.

C2. Clean Valves.—When you are familiar with the parts proceed as follows: Clean the admission and exhaust valve stems by squirting some gasoline or kerosene on the stems. This will clean the valve stem of any grease or dirt. Then push the valves in and out to be sure they work freely. Then oil them with gas engine lubricating oil.

C3. Lubrication.—Examine the grease cups on the main bearings and if there is plenty of grease in cups give the cup an extra turn to force the grease on the bearing.

C4. Attach the lubricator to the oil feed pipe. Fill the lubricator with special **gas engine oil**. Put the small lever on oil cup to vertical position and by means of the knurled nut adjust the oiler for 12 to 20 drops of oil per minute. To increase the flow, turn the knurled nut to the left. To decrease the flow turn the nut to the right. To flush the oiler turn the lever to an angle of 45 degrees. In cold weather the cylinder oil should be diluted with enough kerosene to make the oil flow freely. To stop flow put the lever in horizontal position. Use oil freely, especially when engine is new. If too much is used there will be grey-white smoke in the exhaust.

C5. Water Cooling Hopper.—Next fill the hopper half full of clean water. Warm water aids in starting in cold weather. Keep the hopper tank and water passages clean of any sediment or dirt. Never allow the water to freeze in the hopper. It is easier to drain the hopper than to repair the damage that may be caused by freezing.

C6. Fuel Tank.—Fill the fuel tank with gasoline. Be sure that the fuel used is not some low grade gasoline that has been exposed to the air for some time. Best results are obtained if fresh gasoline is used.

C7. To start.—Close damper in vaporizer, then attach starter crank and give engine a few quick turns. As soon as engine starts, open the starting damper (place damper handle in vertical position) and adjust gasoline throttle as per paragraph E4.

To Start and Operate Engine

- D1. First.**—Tighten grease cups, including that on connecting rod, and set feed on cylinder sight feed oil cup.
D2. Second.—Open throttle to starting mark "S."
D3. Third.—Close damper by putting handle in horizontal position.
D4. Fourth.—Prime the cylinder through the priming cup. Put in one or two priming cupfuls if the engine is cold, and one-half to one priming cupful if the engine is hot. The hotter the engine the less gasoline for priming is required.
D5. Fifth.—Close switch (if battery or gear driven magneto ignition).
D6. Sixth.—Attach starting crank on governor side of engine, and give engine a few quick turns. As soon as the engine starts, open damper and adjust throttle to running position "R" or where it gives best results. As load increases close throttle more.

To Stop Engine

D7.—Close throttle. Shut off oiler. On engines equipped with battery ignition always be sure switch is open when engine is standing still.

Drain hopper in cold weather. A sufficient amount of calcium chloride will prevent water in hopper from freezing. Write us for instructions.

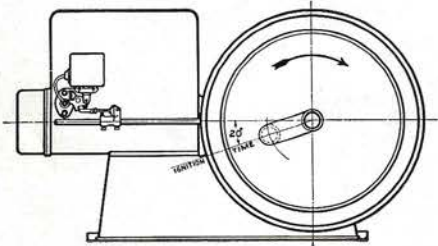


Fig. 1 Showing Ignition Setting.

Suggestions for Good Operation

E1. Ignition Setting.—The engine gives the best results when the ignition is set correctly. On Model "NB" engines, when equipped with battery or magneto, the ignition should take place when the crank pin is about 20 degrees below the inner horizontal center, the piston moving forward on the compression stroke (before center). When the crank pin is in this position the word "snap" stamped on the face of the flywheel will be at the center of the exhaust rod (See Fig. 1), the piston moving in on the compression stroke. Examine the ignition setting frequently. Keeping the ignition set properly will save fuel.

- E2.** Keep the engine as free from dirt as possible.
E3. If the engine is equipped with gear driven magneto, be careful not to get too much oil on the magneto. A few drops of sewing machine oil on the bearing every ten hours' running will be sufficient.
E4. Use the least amount of fuel possible. Adjust the throttle so that the least amount of fuel will be used, and at the same time the engine will maintain its normal speed.
E5. Drain the hopper in cold weather.

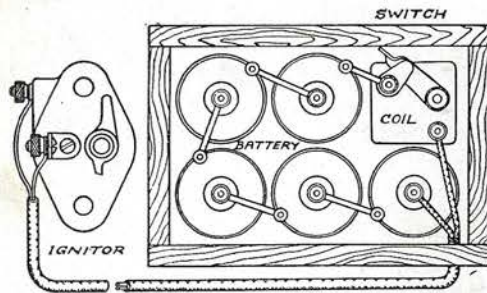


Fig. 2 Showing Correct Way to Connect Battery

Battery

E6. Battery.—If the engine is equipped with dry battery ignition, open the battery box, study the wiring diagram, Fig. 2. Be sure that all connections are tight before connecting wires to the engine, close the switch and rub the two ends of the wires together and by separating them quickly a bright spark should result. Then connect the wires to the binding posts.

Valve Setting

F1. Exhaust Valve.—The burnt gases and refuse from the lubricating oil are forced out through the exhaust valve. Therefore, it is necessary to use good gas engine lubricating oil and keep the fuel throttle set properly. The least accumulation of anything that interferes with the perfect seating of the valve will cause a leak. To determine if the exhaust valve seats properly, turn the flywheel around in the direction the engine runs until the piston moves forward on the compression stroke. If valve seats properly there will be no leaking or hissing noise at the exhaust. Should the valve leak, first be sure that the valve stem is clean. Squirt some gasoline on the stem and push the valve in and out, in order that it will work freely in the valve guide. If the valve still leaks, start the engine and while the engine is running take a pair of pliers and rotate the valve on the seat. Then take a block of wood and tap on the end of the exhaust valve lever right next to the exhaust valve stem. By doing this you will find that the tapping will lift the valve from the seat at the time of the explosion and the force of the explosion will blow any accumulation off the valve seat, thus allowing the valve to seat properly. Should this fail it will be necessary to remove the cylinder head, clean and regrind the valve.

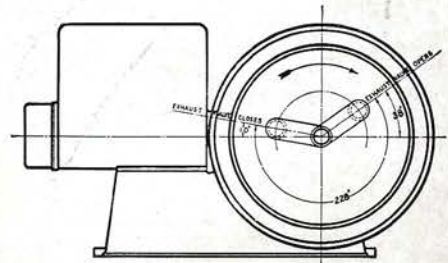


Fig. 3 Showing Valve Setting

F2. Exhaust Valve Setting.—For the best results the exhaust valve should begin to open when the crank pin is 38° above the outer horizontal center, the piston moving out on the power stroke, and should close when the crank pin is 10° above the inner horizontal center, the piston starting to move outward on the suction stroke, that is, the exhaust valve remains open while the crank pin passes through an arc of approximately 228 degrees (See Fig. 3).

Speed of Engine

G1. A slight adjustment of speed is allowable and can be made by adjusting the speed regulator nut. Turn to the right to increase speed and to the left to decrease speed. Best results are obtained when the engine runs at the speed given on the name plate.

Exhaust Piping

H1. In piping the exhaust from the engine, wherever possible use a straight pipe. If the exhaust pipe passes through the wall, place a pipe union right near the cylinder head. If the exhaust pipe is longer than 10 ft. then use a size larger pipe. For each additional 20 ft. of length, enlarge one size. For example, if the exhaust opening in the engine is 1¼" and the exhaust pipe is 15 ft. long, use 1½" pipe; if 25 ft. long use 2" pipe, and be sure to use the large pipe for the total length of the exhaust pipe. Remember for best results the exhaust should reach the open air within the shortest distance possible because long exhaust pipes invariably reduce the power of the engine.

H2. If the exhaust is piped up through the roof, then use a valve at the bottom of the vertical section of the pipe so that the condensed moisture in the pipe may be easily drained. To prevent rain entering the pipe, and in cold weather freezing, in which case the engine may be started but it cannot run with the exhaust pipe plugged up, a good plan is to put the muffler on the end of the pipe, or use a pipe Tee with two short nipples, or an ell with a nipple. Where the sound of

the exhaust is not objectionable and where the exhaust is piped out horizontally remove the muffler. To drain the condensed moisture always have the outside end of the exhaust pipe a few inches lower than where the pipe connects to the engine. For further information see section **F1** and **F2**.

Governor

J1. Governor.—The hit-and-miss method of governing the speed is used on the Model "NB" Engines. The speed governor is so arranged that the engine takes an explosion only when needed to maintain the set speed. If the engine is operating on a light load it will take an explosion, and due to this power impulse, the engine will increase in speed slightly, this slight increase in speed will cause the governor weights to move outward, which movement will force the detent swivel in to the detent catch, thus holding the exhaust valve open. With the exhaust valve open, no charge can be drawn into the combustion chamber, hence the engine continues to run without further power impulses until the speed drops slightly. With the slight drop in speed the detent blade swings out of the detent catch, thus allowing the exhaust valve to close and another charge to be drawn into the cylinder. If the engine is heavily loaded several successive explosions (power impulses) take place to again bring it up to the set speed. Keep the governor well oiled.

Gears

K1. Timing Gears.—When the engine is adjusted at factory, the gears are set in correct relation to each other so that the parts operated by them will move in correct time. Two teeth on pinion and one on gear are marked. If for any reason they should be separated, be very careful to replace them so that the marked tooth on the gear is between the two marked teeth on the pinion, otherwise the parts operated by them will not be in time. If original marks cannot be found, make new ones before separating the gears. Read Section **E1** and Section **F2**.



BUILT IN SIZES:

Model NC Gasoline Engines 1½, 2, 2½, 3½ H. P.

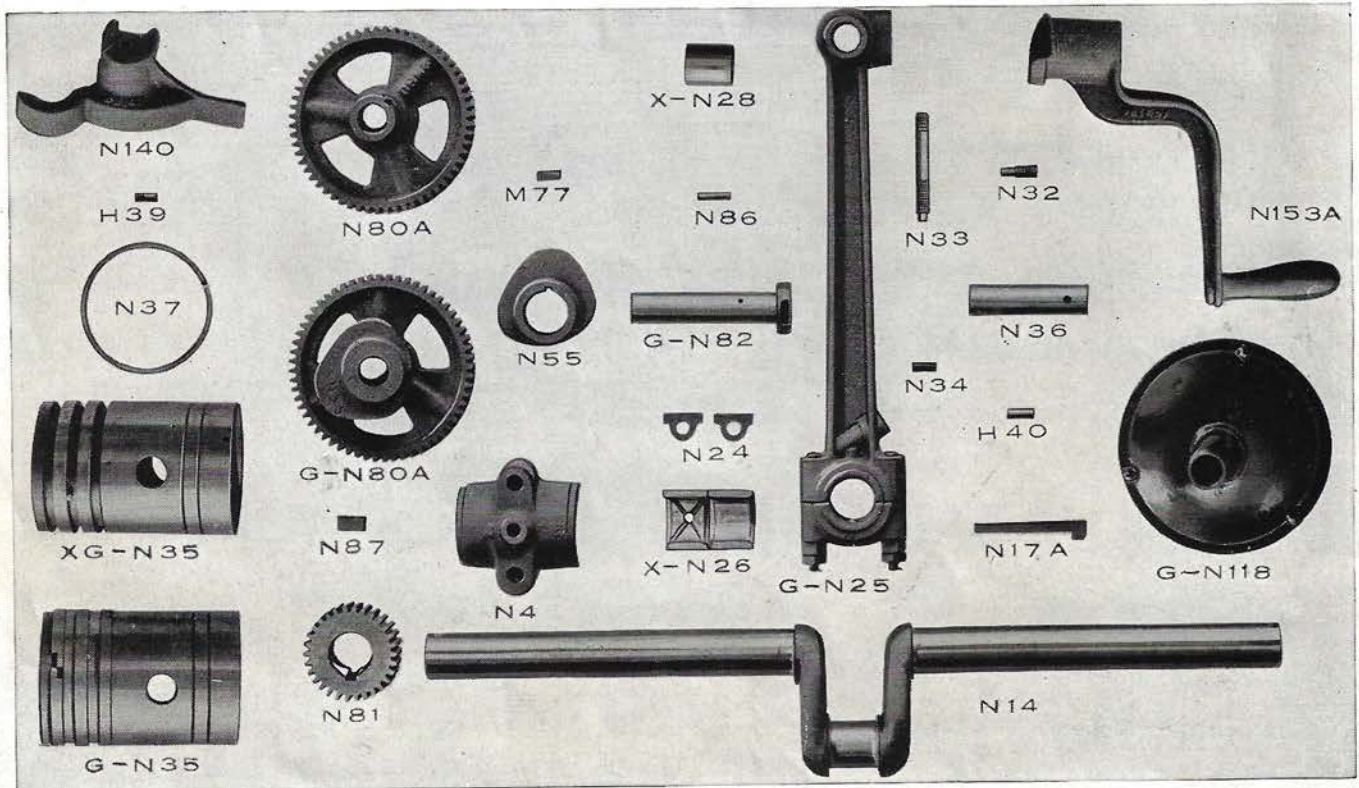
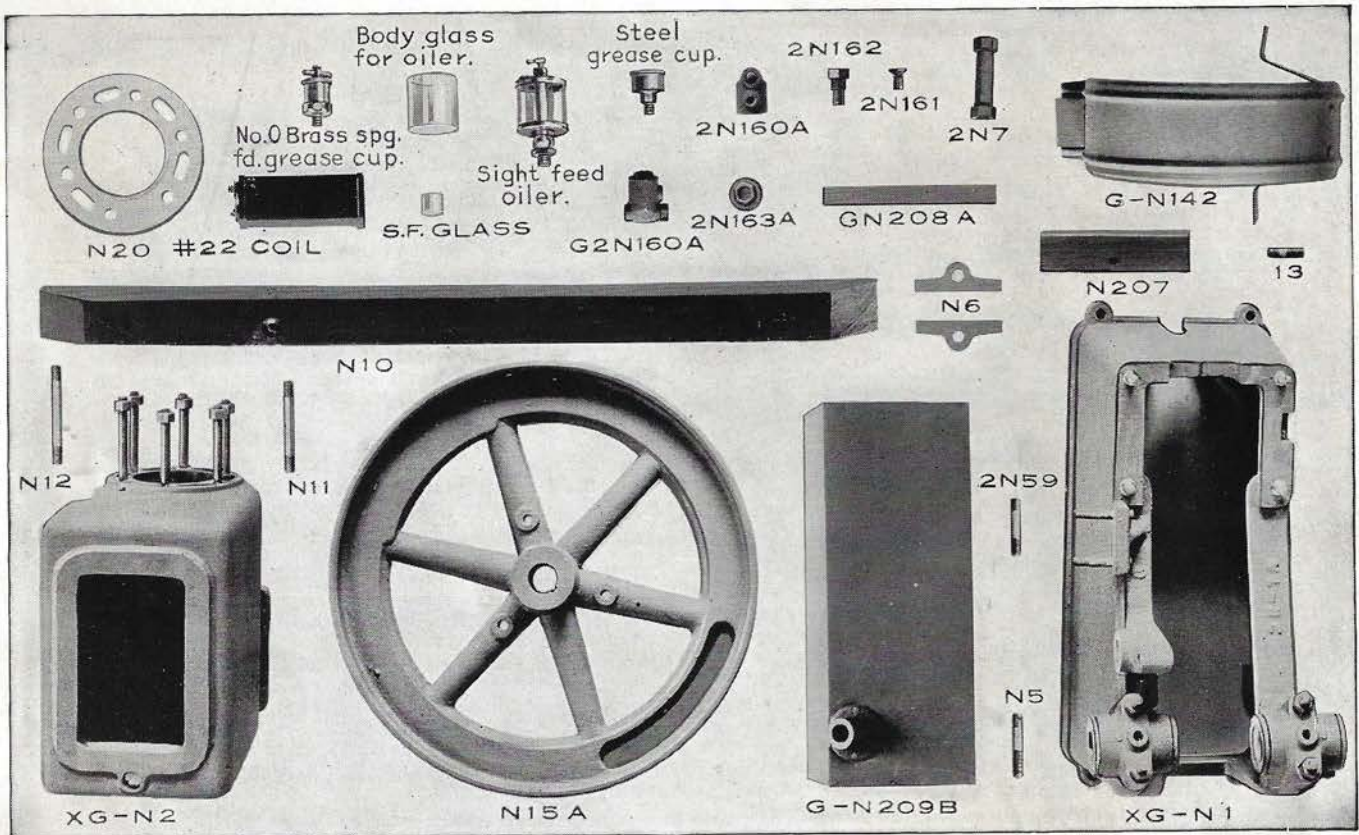
Model NB Gasoline Engines 4, 6, 8, 10, 12 H. P.

Model K Kerosene Engines 3, 5, 7, 9, 12, 15, 20, 25, H. P.

Model A Multiple Cylinder Engines, 2 Cyl. 5 to 8 H. P.; 4 Cyl. 10 to 16 H. P.

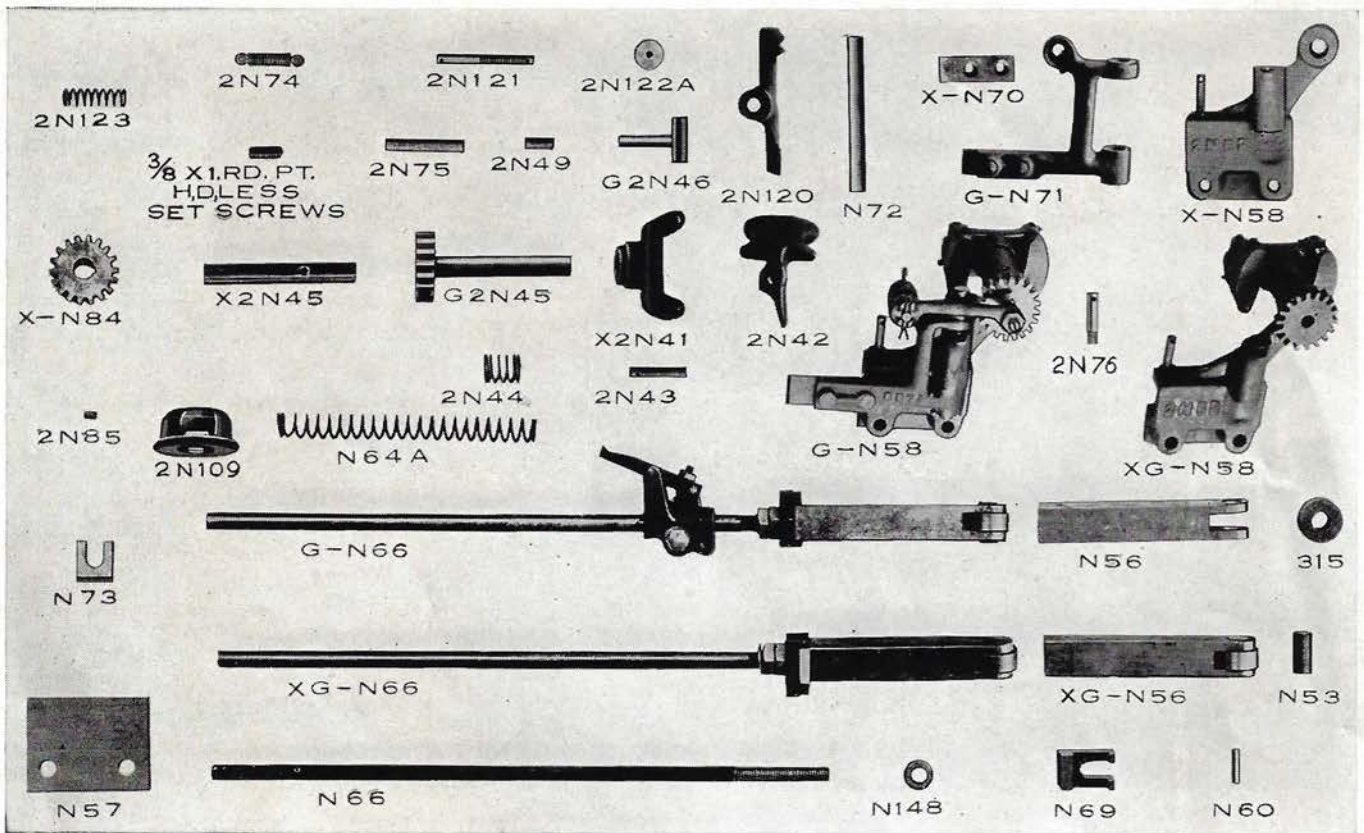
Farm Pump Engines.

Spare Parts for 4 and 6 H. P. Fuller & Johnson Model "NB" Engines

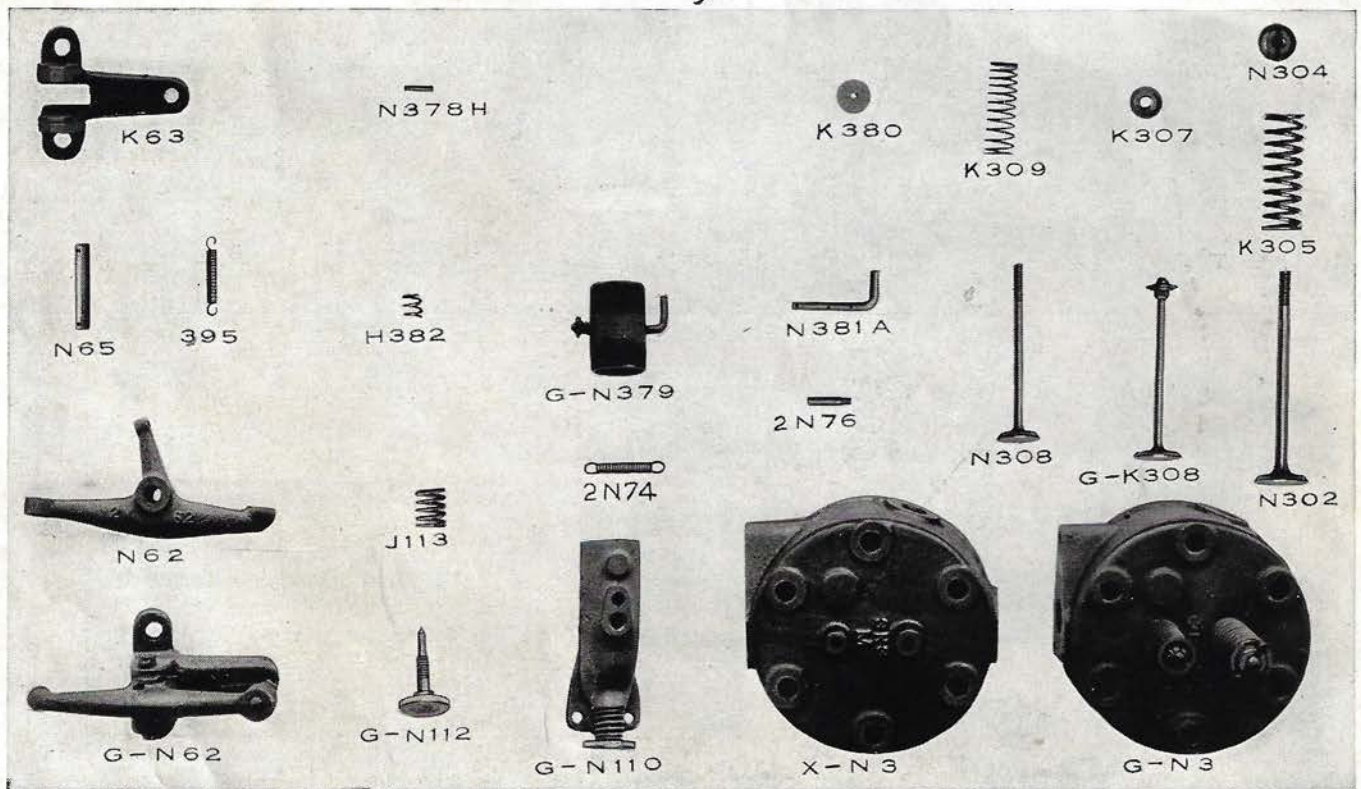


Locate the photograph of the part you want and note the *number* thereunder. Then look up this number in the Price List of Spare Parts, under the horsepower of your engine. You will find there the correct, complete symbol, number, name and price of that particular part.

Spare Parts for 4 and 6 H. P. Fuller & Johnson Model "NB" Engines

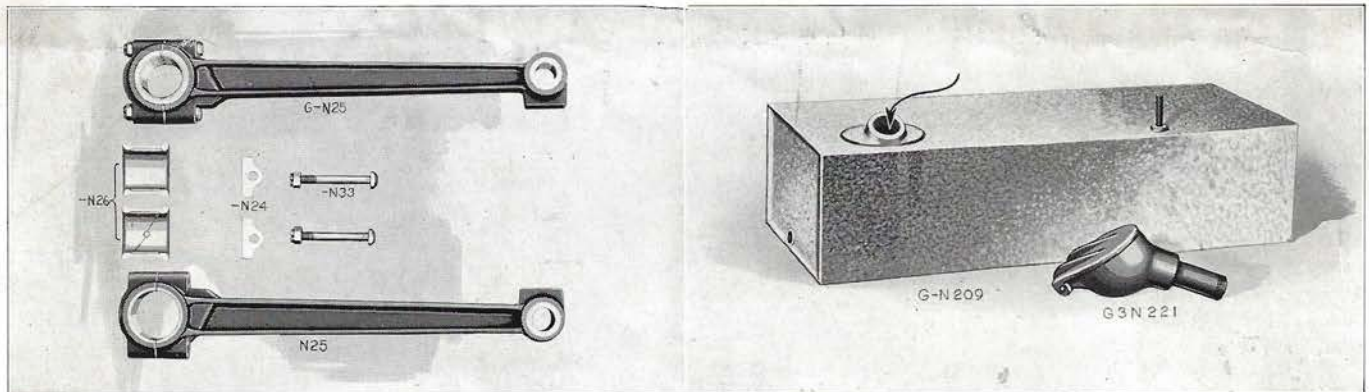
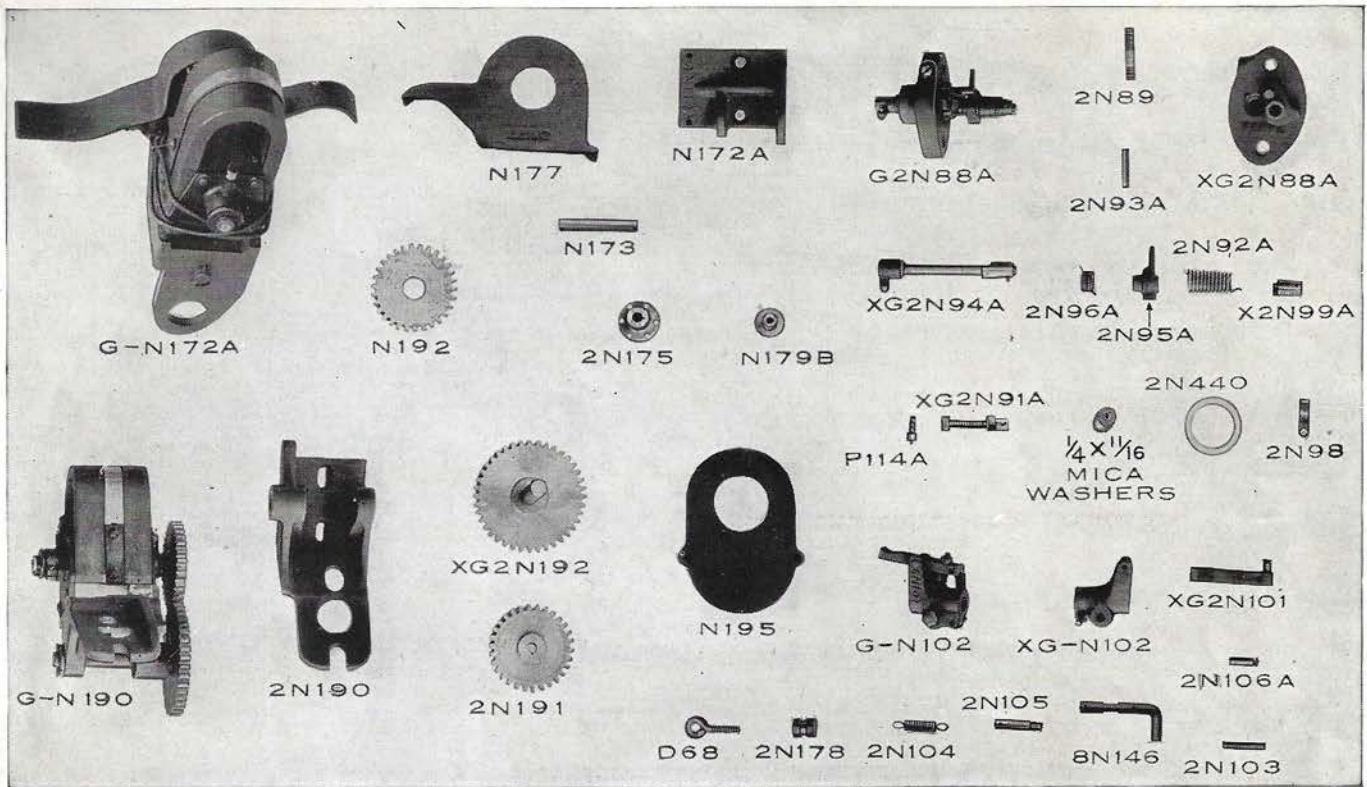


Note—The part numbered G2N45 above should be XG2N84.



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Spare Parts for 4 and 6 H. P. Fuller & Johnson Model "NB" Engines



Locate the photograph of the part you want and note the *number* thereunder. Then look up this number in the Price List of Spare Parts, under the horsepower of your engine. You will find there the correct, complete symbol, number, name and price of that particular part.

Price List of Parts for Fuller & Johnson 4 and 6 H. P. Model "NB" Gasoline Engine.

NOTE: To fill your order correctly we must have your engine number.

Description	Illustrated on page	4 NB		6 NB	
		Symbol and No.	Price Each	Symbol and No.	Price Each
Crank case with bearings, caps and studs.....	4	XG4NB1A	\$30.00	XG5N1A	\$36.00
Cylinder with studs only.....	4	X4NB2	29.00	X5N2A	36.00
Cylinder complete with piston and rings.....	4	XG4NB2	39.00	XG5N2A	48.00
Cylinder head only.....	5	X4NB3	8.00	X5N3	9.00
Cylinder head complete with valves and springs.....	5	G4NB3	12.00	G5N3	13.50
Main bearing cap with bushing (fitted R. H.).....	4	X3N4	2.00	X5N4	2.50
Main bearing cap with bushing (fitted L. H.).....	4	X3N4A	2.00	X5N4A	2.50
Main bearing stud.....	4	2N5	.20	4N5	.25
Main bearing shims (thick, 4 required per bearing).....	4	3N6A	Per set .25	5N6A	Per set .30
Main bearing shims (thin, 10 required per bearing).....	4	3N6B	Per set .40	5N6B	Per set .40
Main bearing studs, extra long, for geared magneto (2).....	4			5N8	.20
Skid.....	4	2N10	1.25	4N10	1.50
Cylinder head stud (short).....	4	2N11	.15	4N11	.15
Cylinder head stud (long).....	4	2N12	.20	4N12	.20
Cylinder crank case stud.....	4	K13	.20	L21	.25
Crank shaft.....	4	4NB14	15.00	5N14	18.00
Flywheel.....	4	4NB15	16.00	6NB15	25.00
Flywheel key.....	4	4N17	.35	6N17A	.40
1/4" Wing nut.....	4	J17	.10	J17	.10
Cylinder head gasket.....	4	4NB20	.50	5N20	.85
Connecting rod shims (per pair).....	4	3N24	.60	5N24	.70
Connecting rod complete with bushings, cap and bolts.....	4	G3N25	8.00	G5N25	10.00
Connecting rod bushing (crank end).....	4	G3N26	1.25	G5N26	1.60
Connecting rod bushing (piston end).....	4	X2N28	1.25	X4N28	1.50
Piston pin set screw.....	4	3N32	.15	3N32	.15
Connecting rod bolt.....	4	3N33	.30	5N33	.35
Piston only with ring pins and oil tube.....	4	XG4NB35	7.00	XG5N35	8.50
Piston complete with rings.....	4	G4NB35	9.00	G5N35	11.00
Piston pin.....	4	3N36	1.35	5N36	1.75
Piston ring.....	4	4NB37	.50	5N37	.60
Piston pin oil tube.....	4	H40	.10	H40	.10
Governor yoke drilled for X2N45.....	5	X2N41	1.50	X2N41	1.50
Governor weight.....	5	2N42	.60	2N42	.60
Governor weight pin.....	5	2N43	.10	2N43	.10
Governor weight spring.....	5	2N44	.10	2N44	.10
Governor shaft drilled and tapped for 2N84.....	5	X2N45	.90	X2N45	.90
Governor thrust rod complete with rod, head and flange.....	5	G2N46	.50	G2N46	.50
Push rod carrier with set screws and 11N47 trip finger stud less trip finger—for Wico magneto.....	6	G3N46	1.50	G5N46	1.50
Finger trip stud (for Wico magneto).....	6	11N47	.10	11N47	.10
Rocker Arm stud (for Wico magneto).....	6	11N48	.20	11N48	.20
Governor thrust bearing.....	5	2N49	.10	2N49	.10
Cam roller pin.....	5	2N53	.10	2N53	.10
Cam.....	4	3N55	1.60	3N55	1.60
Cam slide complete with roller and pin.....	5	XG2N56	2.75	XG2N56	2.75
Cam slide plate.....	5	2N57	.20	2N57	.20
Cam slide bracket with spring stud.....	5	X2N58	3.00	X2N58	3.00
Cam slide bracket complete with yoke, weights, pins, spring, shaft, rod, head, bearing, stud and pinion.....	5	XG2N58	10.50	XG2N58	10.50
Cam slide bracket complete with one XG2N58 bracket, with detent pin, springs, rod, swivel, speed regulator lever, screw and nut.....	5	G2N58	14.00	G2N58	14.00
Cam slide bracket stud.....	4	2N59	.10	2N59	.10
Cam slide dowel pin.....	5	2N60	.05	2N60	.05
Exhaust lever.....	5	2N62A	1.00	4N62A	1.20
Exhaust lever bracket.....	5	3K63	1.25	5K63	1.50
Exhaust rod spring.....	5	2N64A	.20	4N64A	.20
Exhaust lever pin.....	5	2N65	.15	4N65	.20
Push rod complete with slide, pin, collar, catch and roller.....	5	XG2N66	5.25	XG4N66	5.75
Push rod complete with one XG-N66 push rod, with roller and G-N46 push rod carrier.....	5	G2N66Wico	7.50	G4N66Wico	8.00
Detent catch.....	5	2N69	1.25	2N69	1.25
Detent blade, hardened and fitted.....	5	X2N70	.35	X2N70	.35
Detent complete with blade.....	5	G2N71	1.75	G2N71	1.75
Detent pin.....	5	2N72	.20	2N72	.20
Detent shims (set of four).....	5	2N73	.10	2N73	.10
Detent spring.....	5	2N74	.10	2N74	.10
Detent thrust rod.....	5	2N75	.10	2N75	.10
Detent spring stud.....	5	2N76	.10	2N76	.10
Cam key.....	4	M77	.10	M77	.10
Governor gear.....	4	2N80A	3.00	2N80A	3.00
Governor gear complete with cam and cam key.....	4	G2N80A	5.00	G2N80A	5.00
Timing pinion.....	4	4N81	2.25	5N81	2.25
Timing gear shaft with oil reservoir.....	4	G4NB82	1.75	G4NB82	1.75
Governor pinion drilled and tapped.....	5	X2N84	1.25	X2N84	1.25
Governor pinion screw.....	5	2N85	.05	2N85	.05
Timing gear shaft dowel pin.....	4	2N86	.05	2N86	.05
Timing pinion key.....	4	4N87	.10	5N87	.20
Ignitor body studs (Wico magneto or battery).....	6	2N89	.12	2N89	.12
Vaporizer complete with throttle valve and spring.....	5	G4NB110	4.00	G4N110	4.00
Throttle valve complete with knob.....	5	G4NB112	.75	G4N112	.75
Throttle valve spring.....	5	J113	.10	J113	.10
Muffler complete.....	4	G4N118	2.00	G4N118	2.00
Speed regulator lever.....	5	2N120	.35	2N120	.35
Speed regulator screw.....	5	2N121	.15	2N121	.15
Speed regulator nut.....	5	2N122A	.20	2N122A	.20
Speed regulator spring.....	5	2N123	.10	2N123	.10
Timing gear shield.....	4	2N140	.35	2N140	.35
Crank shield complete.....	4	G3N142	1.50	G5N142	1.75
Starting crank.....	4	G3N153D	2.25	G5N153A	2.50
Check valve body complete with valve, plug, cap and valve seat.....	4	G2N160A	3.00	G2N160A	3.00
Check valve strainer plug with screen.....	4	XG2N162	.55	XG2N162	.55
Check valve cap.....	4	2N163A	.60	2N163A	.60
Magneto bracket—Wico.....	6	3N190	2.00	3N190	2.00
Wico magneto with bracket (3N190) rocker arm stud (11N48) and spark plug.....	6	G3N190	14.75	G3N190	14.75
Wico magneto complete ready to install on engine.....	6	G3N190		G3N190	
Gasoline Tank.....	6	G3N46	16.00	G5N46	16.00
Filler funnel complete with cover.....	6	X3N209	4.50	X5N209	5.50
Exhaust valve.....	5	G3N221	1.50	G3N221	1.50
	6	4NB302	1.25	4N302	1.25

Caution—Be sure to give engine number with repair orders.

Price List of Parts for Fuller & Johnson 4 and 6 H. P. Model "NB" Gasoline Engine.

NOTE: To fill your order correctly we must have your engine number.

Description	Illustrated on page	4 NB		6 NB	
		Symbol and No.	Price Each	Symbol and No.	Price Each
Exhaust valve nut	5	2N304	.25	4N304	.35
Exhaust valve spring	5	2N305	.20	H305	.25
Admission valve washer	5	3K307	.05	3K307	.05
Admission valve complete with washer and nuts	5	G4NB308	1.35	G5K308	1.50
Admission valve spring	5	4NB309	.20	5K309	.20
Cam roller	5	2N315	.60	2N315	.60
Damper pipe complete with pin, damper, and handle	5	G2N379	1.00	G4N379	1.00
Damper	5	4NB380	.05	4N380	.05
Damper handle	5	4NB381	.30	4N381B	.30
Damper spring	5	H382	.10	H382	.10
Suction tube complete with coupling	5	G3N398	.60	G5N398	.70
Ignitor gasket—Wico or battery	6	2N440	.10	2N440	.10
Vaporizer gasket	6	3NB442	.10		
Sight feed cylinder oiler	4	X12A2	1.50	X12A3	1.60
Large body glass for cylinder oiler	4		.70		.70
Small sight feed glass for cylinder oiler	4		.30		.30
1/2" Drain cock			.60		.60
9" Steel monkey wrench			.60		.60
3/8-18 Spark plug wrench			.50		.50
No. 0 steel spring feed grease cup	4		1.00		1.00
No. 1 steel grease cup	4		.20		.20
3/8"-18 thread spark plug—long	6		.75		.75
1/8x3/4 priming cup			.60		.60
1/8-60° Street ell for priming cup			.30		.30
Type EK Wico magneto only			13.00		13.00

Special for Battery Ignition, or Gear Driven Low Tension Magneto Ignition.

Ignitor wrench	6	2N7	.40	2N7	.40
Ignitor body with stop pin	6	XG2N88A	1.75	XG2N88A	1.75
Ignitor complete with electrodes, springs, stop pin, loose catch collar and ignitor points	6	G2N88A	6.00	G2N88A	6.00
Ignitor fixed electrode assembled with point	6	G2N91B	.75	G2N91B	.75
Movable electrode spring	6	2N92A	.15	2N92A	.15
Movable electrode stop pin	6	2N93A	.10	2N93A	.10
Ignitor movable electrode with point, collar, and taper pin	6	XG2N94A	2.00	XG2N94A	2.00
Ignitor loose catch	6	2N95A	1.00	2N95A	1.00
Ignitor loose catch spring	6	2N96A	.10	2N96A	.10
Loose catch collar	6	X2N99A	.70	X2N99A	.70
Mica washers—1/4"x 1/8" (per set)			.15		.15
Ignitor pawl with pin	6	XG2N101	.90	XG2N101	.90
Pawl carrier assembled with spring stud	6	XG3N102	1.00	XG5N102	1.00
Pawl carrier complete, with carrier, pawl pins, spring, and spring stud	6	G3N102	2.25	G5N102	2.50
Ignitor pawl pin	6	2N103	.10	2N103	.10
Ignitor pawl spring	6	2N104	.10	2N104	.10
Ignitor pawl spring pin	6	3N105	.10	3N105	.10
Ignitor pawl spring stud	6	3N106	.10	3N106	.10
Battery box only		J324	.90	J324	.90
Geared magneto complete with bracket and gears	6	G2N190	20.50	G5N190	20.50
Geared magneto bracket only	6	2N190	2.00	2N190	2.00
Geared magneto pinion	6	2N191	2.00	2N191	2.00
Magneto idler gear with shaft (geared)		XG3N194	2.25	XG5N194	2.25
Geared magneto gear shield	6	2N195	.40	2N195	.40
Model G Sumpter magneto only			17.50		17.50

Special for Battery Ignition Only.

Battery box complete with five 3" battery connectors, five No. 6 dry cells, one No. 16x6 duplex cable, and one No. 22 coil with switch		GJ324	6.50	GJ324	6.50
No. 22 spark coil with switch			2.20		2.20
3" battery connectors, each			.05		.05
No. 16x6 foot duplex cable, per foot			.05		.05
No. 24 Fahnestock connector			.10		.10

Caution—Be sure to give Engine number with repair orders.

FULLER & JOHNSON MFG. CO.

Engine Specialists

ESTABLISHED 1840

MADISON, WIS., U. S. A.