

BOOK OF INSTRUCTIONS

WISCONSIN *Air-Cooled* Four Cylinder Engine



READ THE *STARTING AND OPERATING INSTRUCTIONS* THOROUGHLY BEFORE STARTING A NEW ENGINE. BECOME ACQUAINTED WITH THE ENGINE COMPONENTS; THEIR LOCATION, MAINTENANCE AND ADJUSTMENT REQUIREMENTS.

LOCATED IN REAR SECTION OF MANUAL

3RD BEARING ENGINE ILLUSTRATION and PARTS LIST, Form MP-1497

FLYWHEEL ALTERNATOR, INSTRUCTIONS and PARTS LIST, Form MY-110-2

CARBURETOR, FUEL PUMP and MAGNETO INSTRUCTIONS and PARTS LIST

Models VH4 • VH4D

3-1/4" Bore – 3-1/4" Stroke
107.7 cu. in. Displacement

ISSUE MM-274-E

NOTE: The VH4 engine with **STELLITE** exhaust valves and seat inserts has the letter 'D' suffixed to the model designation and is referred to as the Model VH4D.

MAINTENANCE

OIL FILTER

A *by-pass* type oil filter is furnished on these engines, as shown in *Fig. 3*, except in a few cases where the use of other accessories prevents the mounting of an oil filter. The *oil filtering cartridge should be replaced after every other oil change*. If operating conditions are *extremely dusty*, replace cartridge after *every oil change*.

AIR CLEANERS

The air cleaner is an essential accessory, filtering the air entering the carburetor and preventing abrasive dirt from entering the engine and wearing out valves and piston rings in a very short time.

The air cleaner must be serviced frequently, depending on the dust conditions where engine is operated. Check hose connections for leaks or breaks; replace all broken or damaged hose clamps.

Excessive smoke or loss of power are good indications the air cleaner requires attention.

The *oil bath* type air cleaner, illustrated in *Fig. 5* is standard equipment on power units. On open engines, the oil bath air filter furnished is illustrated in *Fig. 6*. A *dry element air cleaner* is optionally available for both power unit and open engine.

OIL BATH AIR CLEANER (Fig. 5)

Service daily or twice a day; if engine is operating in very dusty conditions. *Once each week*; in comparatively clean conditions.

Remove oil cup from bottom of air cleaner and clean thoroughly. Add fresh oil to the *level line* indicated on cup, using the same grade oil as used in engine crankcase.

Operating the engine under dusty conditions without oil in the air cleaner or with dirty oil, may wear out cylinders, pistons, rings and bearings in a few days time, and result in costly repairs.

Once a year; or oftener in very dusty conditions, the air cleaner should be removed from the engine and the element, which is not removable, should be washed in a solvent to clean out accumulated dust and dirt.

DRY ELEMENT AIR CLEANER

Service daily; squeeze rubber dust unloader once or twice a day to check for possible obstruction. If engine is operating in very dusty conditions, remove cartridge and shake out accumulated dirt.

Once each week; the filtering cartridge should be taken out and either dry-cleaned with compressed air or washed by repeated dipping for several minutes in a solution of lukewarm water and a mild *non-sudsing* detergent. Rinse in cold water from the inside out and allow to dry overnight before installing.

Do not use gasoline, kerosene or solvent for cleaning. - Do not oil element.



Fig. 5

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After ten washings or one year of service, whichever comes first, replace cartridge.

PRE-CLEANER (Fig. 6)

The collector type pre-cleaner, mounted to the top of the air cleaner, removes the larger dirt and dust particles before the air reaches the main air cleaner.

Daily; clean bowl of accumulated dust and dirt. *Do not use oil or water in pre-cleaner. This must be kept dry.*

FUEL STRAINER (Fig. 7)

A fuel strainer is very necessary to prevent sediment, dirt and water from entering the carburetor and causing trouble or even complete stoppage of the engine. The strainer has a glass bowl and should be inspected frequently and cleaned if dirt or water are present. To remove bowl, first shut off fuel valve, then loosen the knurled nut below bowl and swing the wire bail to one side. After cleaning bowl and screen, reassemble the parts, being sure the gasket

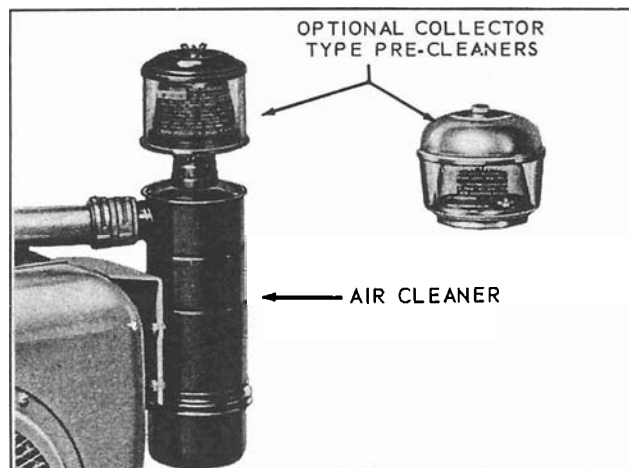


Fig. 6

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the end of the 'X' marked vane on the flywheel, white. Then with the engine operating at 2000 R.P.M. or over, allow the flash from the neon lamp to illuminate the whitened vane. At the time of the flash, the leading edge of the vane should line up with the lower half of the *running spark advance timing hole* on the flywheel shroud, see Fig. 13. If it does not, the *advance arm clamp screw* should be loosened as shown in Fig. 14, and the distributor body turned slightly clockwise or counter-clockwise, as required, until the *white flywheel vane* matches up with the lower half of the *advance timing hole*. Be sure *advance arm clamp screw* is then carefully tightened. If the engine is running below 2000 R.P.M. when timing, the automatic advance in the distributor will not be fully advanced and the inaccurate timing may cause serious damage to the engine when operating at high speeds. Mount flywheel screen if removed – use *slotted opening* without removing screen for running spark advance check only.

DISTRIBUTOR AND GENERATOR MAINTENANCE

The distributor breaker point gap should be .018 to .022 inches. To readjust breaker point gap, turn engine over by means of the starting crank until the distributor breaker arm *rubbing block* is on a high point of the cam. Loosen the *stationary contact lock-nut* and screw *fixed contact*, in or out, until correct gap is obtained. Tighten locknut and recheck gap.

The generator and distributor should be periodically lubricated and inspected for external conditions which would affect their operation.

It is recommended that the generator oiler, located below the primary terminal of the distributor, be given 3 to 5 drops of medium engine oil every 50 hours.

Every 50 hours of operation, the oiler on the side of the distributor base should have 3 to 5 drops of medium engine oil added, and the grease cup given one complete turn. Use a high melting point grease. Every 100 hours, apply 3 to 5 drops of medium engine oil to the felt in the top of the cam sleeve. *Do not over-lubricate.*

FLYWHEEL ALTERNATOR

12 volt – 10 or 25 amp flywheel alternator furnished in place of gear driven generator. Instructions and parts bulletin is located in the rear of this manual.

RESTORING COMPRESSION

In a new engine or one which has been out of operation for some time, oil may have drained off the cylinders so that compression will be weak, causing difficulty in starting. To remedy this condition, remove the spark plugs and pour about a fluid ounce of crankcase oil through the spark plug hole into each cylinder. Turn engine over several times with the hand crank to distribute oil over the cylinder walls. Assemble spark plugs and compression should be satisfactory.

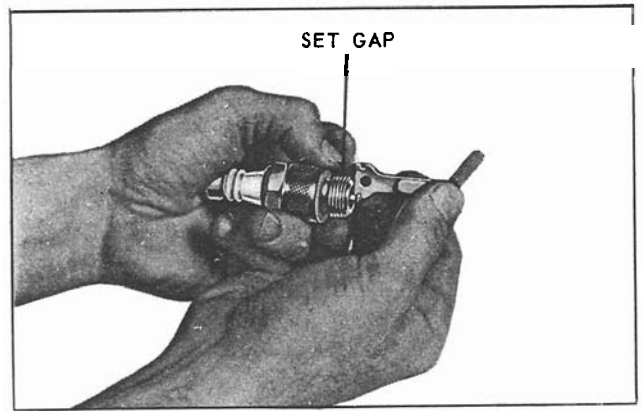


Fig. 16

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SPARK PLUGS, Fig. 16

Incorrect gap, fouled or worn spark plug electrodes, will have an adverse effect on engine operation. Remove spark plugs periodically, clean, regap or replace if necessary. Thread size is 18 mm.

Spark plug gap – 0.030 of an inch.

Replacement plugs must be of the correct heat range, like Champion No. D-16J, AC No. C86 commercial. Tighten spark plugs, 25 to 30 foot pounds torque.

HIGH TEMPERATURE SAFETY SWITCH

As a safety precaution against overheating, engines can be equipped with a high temperature switch mounted to the cylinder head at the No. 4 spark plug.

When cylinder head temperature becomes critically high, the safety switch will automatically stop the engine by shorting out the ignition system. A waiting period of about 10 minutes will be required before the switch has cooled off sufficiently to re-start the engine. An overheated engine will score the cylinder walls, burn out connecting rod and crankshaft bearings, also warp pistons and valves. The cause of the overheating condition will have to be remedied before the engine is re-started. See *Engine Overheats paragraph in Troubles, Causes and Remedies section.* Service Kit is available – see parts list section.

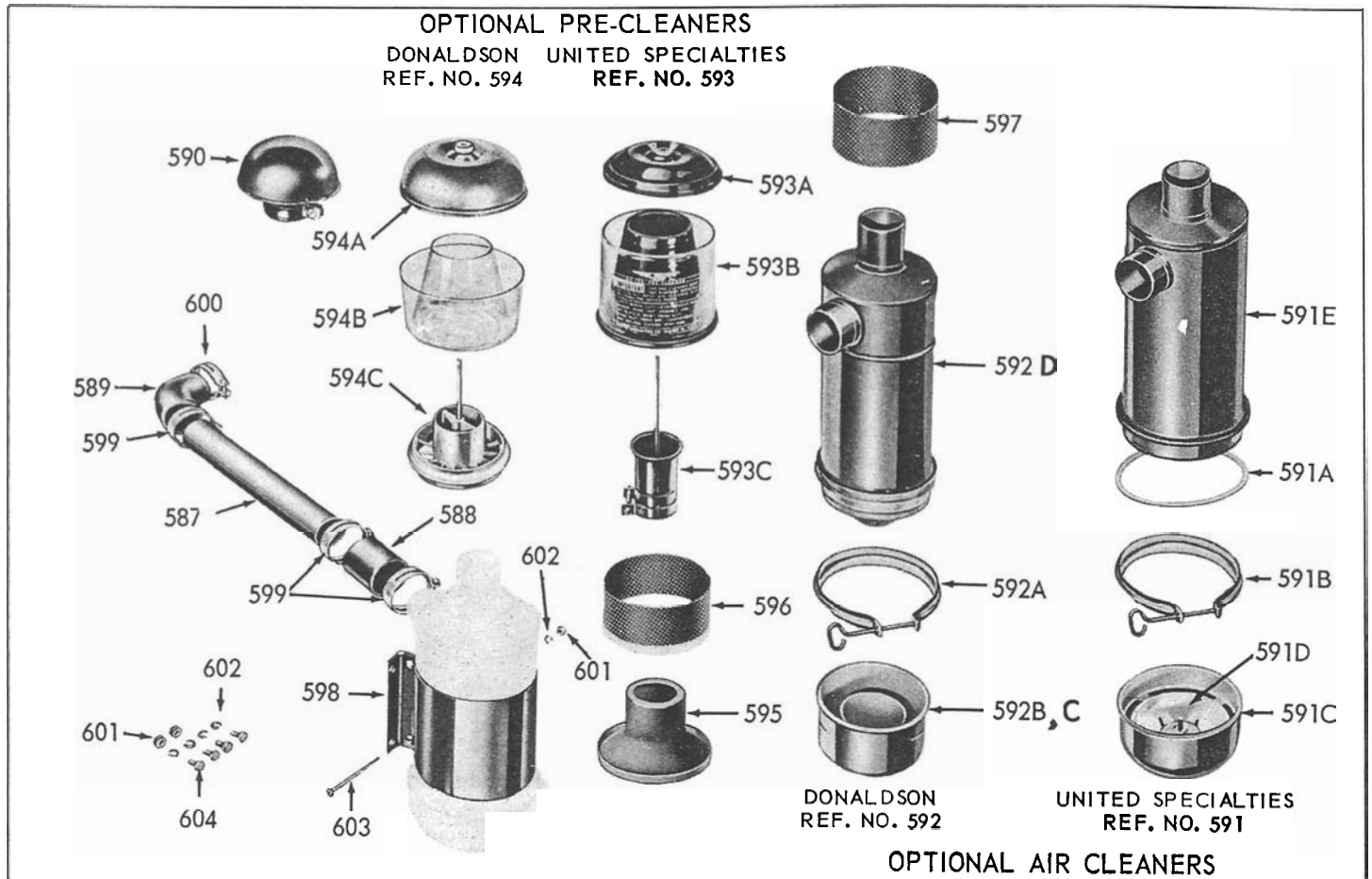
KEEP ENGINE CLEAN - PREVENT OVERHEATING (Agricultural and Industrial Engines)

This engine is cooled by blasts of air which must be allowed to circulate all around the cylinders and cylinder heads to properly cool the engine and thereby keep it in good running condition. If *dust, dirt or chaff is allowed to collect in the cylinder shrouding or in the V between the cylinders*, it will retard the flow of air and cause the engine to overheat. Keep *flywheel screen* and *rotating screen* clean, so as not to restrict the intake of cooling air.

With reference to Fig. 17; follow the cleaning and maintenance instructions pointed out, to obtain trouble free and satisfactory engine performance.

1. Remove these covers frequently and clean out all dust, dirt and chaff. Be sure to replace covers.

LAA-102, LAA-103 Side Mount Air Cleaner Assemblies for Model VH4D



LAA-102 includes LO-86, LAA-103 includes LO-114, all other parts are the same.

Fig. 66

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Ref. No.	Part Number	Description	No. Req	Net Wt.		Ref. No.	Part Number	Description	No. Req	Net Wt.	
				Lb	Oz					Lb	Oz
587	LJ-120	TUBE for air cleaner to carburetor elbow	1	1	1	594	LO-114	PRE-CLEANER, collector type.....	1	1	8
588	LL-27	RUBBER HOSE for air cleaner tube	1		2			Service parts:			
589	LL-67	RUBBER ELBOW for air cleaner tube ..	1		4	594A		22-P20116 Cover assembly	1		4
590	LO-96	STACK CAP for United Spec. air cleaner	1		12	594B		22-P20115 Body	1		4
	LO-86	STACK CAP for Donaldson air cleaner			10	594C		22-P20120 Sleeve assembly	1	1	
591	LO-121-S1 (Obsolete)	AIR CLEANER, United Spec. No. 45D4 For replacement order LO-157-1-S1.	1	3	12	595	LO-133	BASE for United Spec. pre-screener ...	1		4
		Service parts:				596	LO-134	PRE-SCREENER for LO-109 pre-cleaner	1		2
591A		81-615A6 Gasket	1		1	597	LO-147-A	PRE-SCREENER for LO-114 pre-cleaner	1		4
591B		81-214B1K011 Clamp assembly	1		2	598	PG-291	STRAP for mounting air cleaner	1	1	
591C		81-496B1K111 Oil cup (order baffle sep.)	1		6			STANDARD HARDWARE			
591D		81-415B1K11 Baffle	1		3	599	LK-8	HOSE CLAMP, 2-1/8" I.D.	3		2
591E		Body assembly	1					For air cleaner connections.			
592	LO-157-1-S1 (2 1/2" stack)	AIR CLEANER	1	3	12	600	LK-10	HOSE CLAMP, 2" I.D.	1		2
		Service parts:						For air cleaner elbow, carburetor end.			
592A		22-P2846 Clamp assembly	1		3	601	PD-77	NUT, 1/4"-20 thread, hexagon steel	4		1
592B		22-P15463 Inner oil cup	1		4			For air cleaner strap mounting.			
592C		22-P14889 Outer oil cup	1		6	602	PE-3	LOCKWASHER, 1/4" spring lock	6		1
592D		BODY (Order complete air cleaner.) LO-119-A-S1, replaced by LO-157-1-S1. 22-P14818 Oil cup assembly must be used for service on LO-119-A-S1.				603	XA-74	SCREW, 1/4"-20 thread x 2 1/4" long, round head, for air cleaner strap clamping ...	2		1
593	LO-109	PRE-CLEANER, collector type	1	1	12	604	XD-4	SCREW, 1/4"-20 thread x 1/2" long, hex- agon head, for strap to shroud	4		1
		Service parts:									
593A		81-A16380 Cap assembly	1		4						
593B		81-B16382 Body assembly	1	1							
593C		81-A16370 Sleeve assembly	1		8						

Order parts from nearest SERVICE CENTER shown in directory following parts list.

IMPORTANT: Always give Model, Specification and Serial Numbers as shown on name plate.