Autolite Ford

OWNER'S OPERATOR MANUAL

MODELS

91 CUBIC INCH V-4 O.H.V. ENGINE
104 CUBIC INCH V-4 O.H.V. ENGINE
122 CUBIC INCH V-6 O.H.V. ENGINE

SERIAL NO. _____

MODEL NUMBER _____

SPECIAL OPTION NO. _____

FORD MOTOR COMPANY
AUTOLITE-FORD PARTS DIVISION

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REVISED 7-68

Foreword

The operating instructions and maintenance recommendations in this manual will help you to become acquainted with — and receive the most satisfactory performance from — your new Ford Industrial Heavy Duty Engine. How long your new engine will continue to deliver optimum performance depends on the care it receives. The maintenance procedures contained in this manual should be performed at the recommended intervals. The operator or service personnel responsible for the care of this engine should be thoroughly familiar with these procedures.

The manual is divided into five sections as follows:

General Information and Description will familiarize you with this unit.

Instruments, Preparation, Break-In, Operation and Storage will familiarize you with the instruments and will aid you in preparing the engine for immediate use, operation and storage.

Preventive Maintenance

Minor Repairs and Adjustments

Metric Equivalents

We, here at Ford, are highly pleased that you have selected a Ford engine for your power requirements. Feel free at any time to consult your Ford Industrial Products Distributor, or write directly to us, concerning any problem you may encounter with your new engine.

The descriptions and specifications contained in this manual were in effect at the time it was released for printing. The Autolite-Ford Parts Division of Ford Motor Company reserves the right to discontinue models at any time or change specifications or design, without notice and without incurring obligation.

INDUSTRIAL PRODUCTS
AUTOLITE-FORD PARTS DIVISION
FORD MOTOR COMPANY
P.O. BOX 3000
LIVONIA, MICHIGAN 48151

General Information and Description

IDENTIFICATION

A plate (Fig. 1) is affixed to each engine. The plate contains a number indicating engine type, the serial number, and a number indicating optional equipment. When ordering parts, or carrying on correspondence concerning the engine, all three numbers should be mentioned.

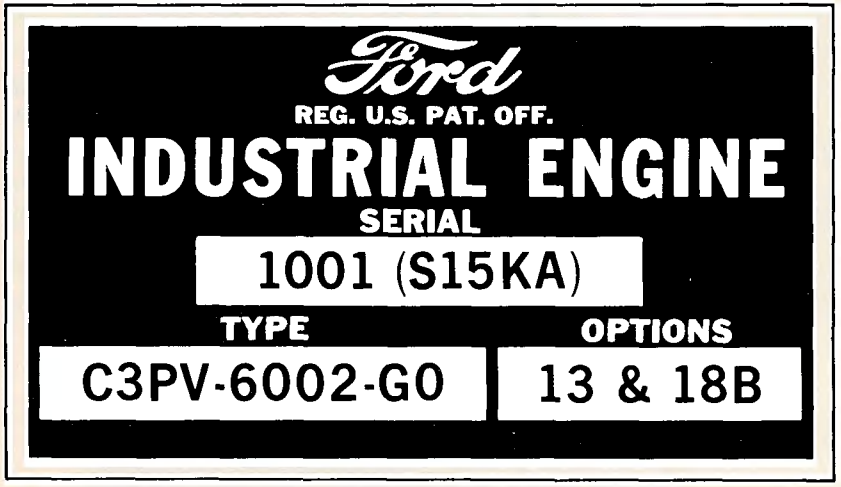


Fig. 1 — Engine Identification Plate

PARTS AND SERVICE

Replacement parts can be obtained through local Ford Industrial Products Distributors and Dealers or by writing directly to:

Autolite-Ford Parts Division
Ford Motor Company
Industrial Engine Department
P.O. Box 3000
Livonia, Michigan 48151

This manual covers a variety of operating instructions and routine maintenance recommendations. It is suggested that, whenever repairs of a major nature need to be performed, that the engine owner contact the local Ford Industrial Products Distributor or Dealer. These Distributors and Dealers are equipped to perform major and minor repairs, and, if necessary, furnish technical service advice.

DESCRIPTION

The Ford 91 and 104 engines are of V-4 overhead valve design, with the 91 engine having a cylinder displacement of 91.5 cubic inches and the 104 engine having a cylinder displacement of 103.7 cubic inches. The Ford 122 engine is of V-6 overhead valve design and has a cylinder displacement of 121.9 cubic inches. Specifications for all three engine sizes are included at the end of this section under "General Data."

All engines have the same basic design, and the following description is applicable to all models except where otherwise noted.

The cylinder block is of cast-iron construction for strength and rigidity, and has a 60° V-angle for an extremely compact configuration. The precision-molded cast-iron crankshaft is carried in replaceable copper alloy bearings. Three main bearings are used on the V-4 engines and four main bearings are used on the V-6 engine.

The camshaft is supported by babbit bearings pressed into the block, and driven by the crankshaft through helical cut gears. The

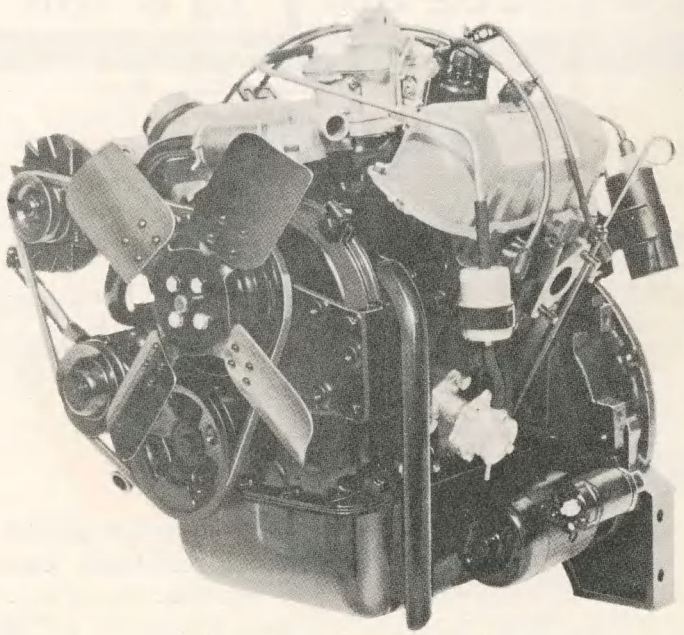


Fig. 2 – Typical 91 Cubic Inch V-4 Ford Industrial Engine

distributor and oil pump are driven by a gear at the rear of the camshaft, while the fuel pump is driven by an eccentric at the front of the camshaft.

The cylinder head assemblies contain the fuel intake and exhaust passages, the intake and exhaust valves, and the rocker arm and shaft assemblies. Valve guides are an integral part of the head. The valves are actuated through solid lifters, steel push rods, and individual rocker arms.

The intake manifold has individual passages to the intake openings in the cylinder heads. All the coolant passing through the engine flows through the intake manifold, and is discharged through a connection at the front. The coolant provides the heat necessary to assist in vaporizing the incoming fuel charge in the intake passages.

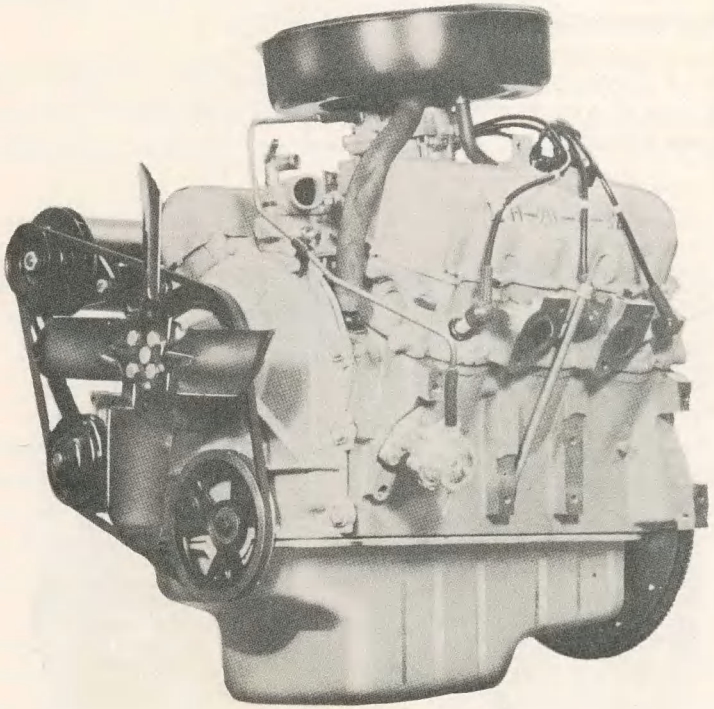


Fig. 3 – Typical 122 Cubic Inch V-6 Ford Industrial Engine

All engines have a pressure-type lubrication system, fed by a rotor-type oil pump mounted at the rear of the crankcase. A non-adjustable spring loaded relief valve in the pump limits the maximum pressure in the system to approximately 50 psi. A full-flow filter on the right cylinder bank filters the entire output of the pump before the oil enters the engine.

The connecting rods are steel forgings with replaceable copper-lead alloy insert bearings at the bottom end. The aluminum pistons have three rings — two compression and one oil control. The top compression ring is chrome-plated. The oil control ring consists of a center spring and two chrome-plated steel rails.

The cooling system is the single stage-type with one water pump and one thermostat. The coolant is drawn from the bottom of the radiator by the centrifugal-type water pump which delivers it through tubing to both sides of the cylinder block at the rear. The coolant flows through the cylinder banks, cylinder heads, and into the intake manifold. A thermostat at the front of the manifold controls the discharge of coolant to the radiator.

The V-4 engines also feature an internal balance shaft (Fig. 4) that is gear driven at engine speed by the crankshaft. Its purpose is to reduce vibration at all speeds and provide a smoother flow of power.

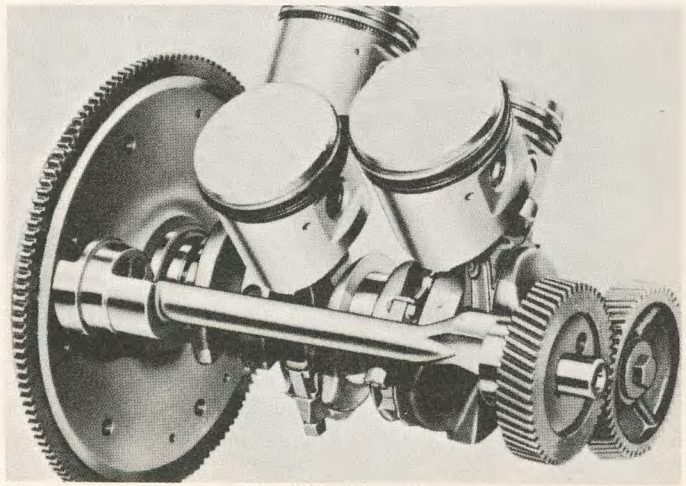


Fig. 4 — V-4 Engine Balance Shaft

GENERAL DATA

Type — 91 (C3PV/091GF) and 104 (C7PJ/104GF)	V-4, 60°, Overhead Valve
— 122 (C6PK/122GM)	V-6, 60°, Overhead Valve
Fuel	Gasoline, Regular, 90-94-Octane
Bore and Stroke — 91 V-4	3.54 x 2.32
— 104 V-4	3.54 x 2.63
— 122 V-6	3.31 x 2.37
Displacement — 91 V-4	91.4 Cu. In.
— 104 V-4	103.7 Cu. In.
— 122 V-6	121.9 Cu. In.
Compression Ratio — 91 V-4	8.0 to 1 Nominal
— 104 V-4 and 122 V-6	9.0 to 1 Nominal
Cylinders and Crankcase	Cast Integral, Controlled Quality Finish for Uniform Oil Film
Pistons	Autothermic, Aluminum Alloy, Tin-Plated 3-Ring Type
Piston Rings	Three — Top Ring Chrome-Plated Chromed Triple-Seal Oil Ring
Connecting Rod Bearings	Steel-Backed Replaceable Insert, Copper-Lead Alloy, Tin-Plated
Crankshaft	Precision-Molded Cast Alloy
Camshaft	Precision-Molded Special Cast Iron — Gear Driven
Valves — Exhaust	Silichrome Alloy Steel
— Intake	SAE 1047 Aluminized
Lubrication	Full Pressure — Full-Flow Filter
Oil Capacity — 91 and 104 V-4	3-1/2 Quarts Dry 3 Quarts Refill
— 122 V-6	4 Quarts Dry 4-1/2 Quarts Refill
Electrical System	12 Volt, Negative Ground
Ignition	Battery
Distributor (Std.)	Centrifugal — Vacuum Advance Type
Spark Plugs	Autolite AE 22
Firing Order — 91 and 104 V-4	1-3-4-2
— 122 V-6	1-4-2-5-3-6
Generator (Std.)	20 amp. — 15 volt
Temperature Control	Thermostat in Intake Manifold
Water Pump	Prelubricated Centrifugal Type

Instruments, Preparation, Break-in, Operation and Storage

TEMPERATURE GAUGE

The temperature gauge is positioned so the operator can keep close check on the engine operating temperature. When the coolant level becomes low or the cooling system becomes clogged or inoperative, excess heat cannot be carried away effectively. If the engine is permitted to operate in an overheated condition, extensive damage to the pistons, cylinder walls, and bearings will result. Therefore, the temperature should be checked often to assure that the engine is not overheating. If the engine does overheat, it should be stopped according to the instruction under "Stopping" noted in this section of the manual.

This gauge is separated into three (3) bands. The "orange" band to the left of the gauge indicates cold operating temperature. The wider "green" band in the center of the gauge is the operating range for this engine. The "red" band to the right of the gauge indicates excessive coolant temperature (overheat) or *danger*. The engine must not be operated in the "red" band. Engine speeds and loads should be kept low while the temperature gauge is in the "orange" (cold) band. See page 11 for warm-up procedure.

Oil Pressure Indicator Light

The oil pressure light indicates either low or lack of oil pressure (7.5 to 4.5 psi). The light will flash on when the starter switch is turned on and will not turn off until the engine is started and has developed sufficient oil pressure. If the oil light comes on while the engine is operating above an idle speed, stop the engine. *Do not run the engine with this light on.* The light may occasionally glow or flicker when the engine is idling slowly. This is not harmful. The light *must* turn off, however, as soon as the engine speed is increased above idle. If it stays on, check the engine oil level and add oil if it is too low. This may correct the problem. If it does not, a minor or major repair may be in order.

Charge Indicator Light

The charge indicator light will indicate a discharge condition with starter switch on before the engine is started. The charge indicator light glows red when the generator is not supplying current to the electrical system. The charge light may glow or flicker occasionally as engine idles. However, if the light remains on steadily at normal operating speeds, generator and electrical system should be checked as soon as possible for malfunction.

Optional Instrument Information

Tachometer: Engine revolutions per minute (RPM) are indicated on the Tachometer. This instrument is highly useful, particularly on installations requiring a constant engine speed. The maximum speed at which this engine should be operated continuously is 3800 RPM. It is suggested that red line be painted on the face of the tachometer at the 3800 RPM position. The standard optional tachometer used with the V-4 engine or power unit is a mechanical type.

Safety Switch: The low oil pressure and high water temperature safety switch automatically shuts off the ignition when the oil pressure drops below a pre-set value, or the water temperature rises above a pre-set value. The low oil pressure switch is calibrated to activate at 4.5 pounds. The adjustable contact screw on the water temperature safety switch should be set at 220°.

PREPARATION—BEFORE OPERATION

Before placing your new engine or power unit in operation, thoroughly inspect it to make sure it is not externally damaged.

Remove the drain plugs on each side of the engine block (page 24) and open the drain cock at the bottom of the radiator. Flush the cooling system thoroughly with clean water, then replace the block drain plugs and close the radiator drain cock. Fill with long life coolant as indicated on page 23. Also add one can of Rotunda Rust Inhibitor #8A-19546-C.

Pull out the level indicator and check the oil level. If it is necessary to add oil, use recommendations shown on page 19. Check the transmission or power take-off if engine is so equipped, for complete lubrication.

BREAK-IN

Certain precautions should be followed during the first few hours of operation to make sure the engine will not be damaged during the break-in period. Change the crankcase oil after the first 15 hours of operation. During the first few hours of operation, check the oil level often (at least every 2 or 3 hours) until a pattern of oil consumption, during break-in, is established. Top compression piston rings are hard chrome-plated and usually take longer to seat to the cylinder walls than regular cast iron rings. During the initial break-in of the engine, oil consumption will be greater than normal. Add make up oil as required to maintain the proper level between the "Max" and "Min" marks on the oil level indicator.

PREPARATION—AFTER BREAK-IN (or initial 15 hours)

Crankcase: After the first 15 hours of operation, drain the oil from crankcase and change the oil filter. Drain the engine oil with the engine at normal operating temperature. Refill the crankcase to proper capacity with new oil of the proper grade and viscosity. (See page 19)

Oil Pan: Torque pan screws to 5 ft. lbs.

Cylinder Heads: Torque cylinder head bolts to 60 ft. lbs. Follow the sequence shown on page #28.

Intake Manifold: Torque manifold bolts to 21 ft. lbs. Use the sequence shown on page #28.

Miscellaneous: Check and tighten, if needed, the following: Carburetor, Fuel Pump and Exhaust Manifolds.

Valve Lash and Rocker Arm Stands: Torque rocker arm stands to 35 ft. lbs. Lash the valves .016" hot. See page 30 for procedure.

Coolant Level: If required, fill to proper level with recommended coolant, (Page #23).

Distributor: Check dwell and initial spark advance. Reset if necessary to specifications (see page #43).

Idle Speed: With engine at operating temperature, adjust for best idle mixture, then set idle speed to 700-850 RPM.

Belts: Retension belts. Adjust belts approximately 1/2 inch defection, at longest belt span.

OPERATION

After you have become familiar with the instruments, read the following instructions carefully.

Starting

Release the load on the power take-off, or if the engine is equipped with a transmission, release the clutch. If the engine is started with the clutch engaged, it imposes additional strain on the starter and battery.

Turn on the ignition switch. Pull the throttle out about 1/2 inch and the choke out about half-way. Engage the starter. After the engine starts, push the throttle in and adjust the choke for fast idle warm-up. The throttle control can be locked in any position to maintain a desired engine speed by turning the control handle clockwise.

NOTE: *If the engine is hot or flooded with fuel and does not start promptly, pull the throttle out all the way and crank the engine continuously until it starts. Do not use the choke.*

In warm weather, use of the choke while starting, may be limited, or may be unnecessary.

When starting the engine in cold weather, pull the choke out all the way until the engine starts. Adjust the choke setting to keep the engine running smoothly. When the engine is at normal operating temperature, push the choke all the way in.

To avoid hard starting under cold conditions, the engine should be completely winterized.

Warm-Up

A high percentage of wear occurs when a cold engine is first started. After an engine has been shut down and allowed to cool, the majority of the lubricating oil drains off the moving parts back into the oil pan. Engine oil does not flow freely or lubricate properly until it has reached normal operating temperature. If an engine is operated at excessive speeds or under heavy load when cold, wear will greatly be accelerated. Extensive damage to cylinder walls and pistons can result.

NOTE: *Always operate the engine at fast idle speed for approximately ten minutes before loading. If this practice is followed, engine life will be increased considerably.*

Stopping

Disengage the clutch, then turn off the ignition switch. If the engine has been running extremely hot, let it idle for a few minutes to dissipate the excess heat. If the engine is stopped abruptly when it is over-

heated, the valves may warp or stick in the guides. An abnormal overheated engine may continue to run after the ignition switch has been turned off. If this situation is encountered, turn on the ignition switch immediately, and allow the engine to idle until it has cooled enough to stop. In an emergency, shut off the fuel supply to stop the engine. Check the coolant and oil levels immediately, add engine oil if necessary, then start the engine and add coolant slowly until the radiator is full. Allow the engine to idle until the engine temperature has dropped to normal.

Never turn off the ignition, then suddenly pull the choke out, with the thought in mind that this will "prime" the system for the next start. This is poor practice, as large quantities of raw gasoline entering the combustion chambers will wash the oil off the cylinder walls. When started again, the engine will operate for a few moments without sufficient lubrication on the cylinder walls, with resulting scuffing of the pistons, rings, and cylinder walls.

STORAGE

The following instructions are applicable to the storage of a new or used engine or power unit.

For One Month

1. Run the engine at 1500 RPM and treat the upper cylinders by spraying an engine preservative oil M-2C39 SAE #50 into the carburetor air intake for about two minutes. Open the throttle for a short burst of speed, then shut off the ignition and allow the engine to come to a stop while continuing to spray the oil into the carburetor air intake.

2. Leave the spark plugs installed and cover all engine openings with dustproof caps or shields.

3. Drain the oil, water and gasoline.

4. If the engine is less transmission, spray the flywheel and ring gear with an anti-rust bodied oil.

For Indefinite Period

1. Drain the crankcase completely and refill with an engine preservative oil (SAE 10).

2. Run the engine until it is completely out of gasoline, then restart and run it on an unleaded, undyed gasoline for at least 10 minutes. Run the engine at 1500 RPM and treat the upper cylinders by spraying an engine preservative oil (M-2C39 SAE #50) into the

carburetor air intake for about two minutes. Open the throttle for a short burst of speed, shut off the ignition and allow the engine to come to a stop while continuing to spray the oil into the carburetor air intake.

3. Drain the oil, and gasoline. Drain the water at the bottom of the radiator and both sides of the block.

4. Remove all grease and oil from the exterior surfaces of the engine.

5. Leave the spark plugs installed.

6. Seal all engine openings and accessories with water resistant adhesive tape. Mask off all areas to be used for electrical contact.

7. Make sure all surfaces are dry, then spray all taped openings, all engine accessories including ignition wiring, and all exterior surfaces of the engine with an ignition insulation compound.

8. If the engine is equipped with a fiber-disc automotive type clutch, block the clutch in a slightly disengaged position so that the lining and pressure plate are not in contact.

CAUTION: *Do not completely depress the clutch lever.*

Preventive Maintenance

Your Industrial Heavy Duty Engine or Power Unit was carefully inspected before leaving the factory. In order to keep your unit at peak operating efficiency, certain preventive maintenance operations are necessary. On a Day-To-Day basis 10 hours, 50 hours, 100 hours, 500 hours, 1000 hours, and seasonally, certain adjustments, lubrications, inspections, and routine services must be performed. The preventive maintenance operations are given on the following pages. In addition, a quick reference Preventive Maintenance Schedule is listed on page #26.

DAY-TO-DAY CARE

The following items should be checked or serviced each day or when the engine has been operated for 10 hours, whichever comes first.

Oil Level

The oil level indicator is located on the left-hand side of the engine. It is preferable to check the oil level after the engine has been stopped for a period of time, such as overnight. This allows the oil in the overhead valve system to drain back into the oil pan permitting a more accurate measurement of the quantity. Add heavy-duty MS Type engine oil of the viscosity recommended for the lowest expected ambient temperature (Table 2, page 19).

Coolant Level

Maintain the coolant level at one inch below the top of the radiator upper tank.

CAUTION: *When the engine is hot, remove the radiator cap carefully. Turn the cap to the safety stop, then allow the pressure to escape before removing the cap.*

In freezing weather, test the anti-freeze solution before adding coolant to the system, to determine how much additional anti-freeze will be necessary to maintain proper protection (page 19).

NOTE: *Do not add coolant to an engine that has become overheated due to low coolant supply until the engine cools, or a cracked cylinder block or head may result.*

INITIAL 15 HOURS: See page #10 — PREPARATION AFTER BREAK-IN

EACH 50 HOURS

After each 50 hours of operation, service the following items as indicated.

Carburetor Air Cleaner

A heavy-duty hat type oil bath air cleaner is used for the engine unit. Another type of heavy-duty air cleaner is supplied with the enclosed power unit. The use of a heavy-duty air cleaner is extremely important. Operation of this engine in any application without an adequate air cleaner will *jeopardize* the warranty.

Fig. 5 — Industrial Engine Air Cleaner

The function of the carburetor air cleaner, in addition to its operating as a silencer, is to filter the air entering the engine induction system. The air cleaner must filter approximately 10,000 gallons of air for every gallon of fuel consumed. When the air passes through the cleaner, it is mixed with fuel in the carburetor. Air that contains dirt and grit will naturally produce a grimy fuel mixture. If the mixture of fuel and air entering the combustion chamber is grimy, it will cause severe damage to the cylinder walls and piston rings. This damage will cause high oil consumption and short engine life. A restricted or dirty air cleaner will also cause a rich fuel mixture. As a result, it is very important that the air cleaner be serviced each 50 hours.

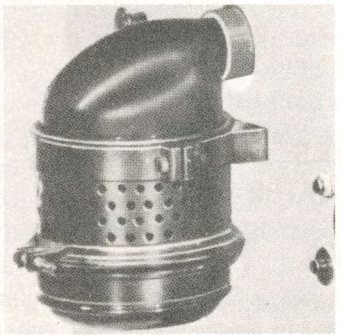


Fig. 6 — Power Unit Air Cleaner

CAUTION: *The air cleaner should be serviced more frequently under severe dust conditions.*

Industrial Engines

Drain the oil reservoir, wash the components in solvent then saturate the maze screen with oil. Fill the reservoir with engine oil to the

level indicated in the reservoir. Use S.A.E. 30 for temperatures above 32°F., and S.A.E. 10 for temperatures below 32°F. (Fig. 5)

Power Units

Rinse the cap in solvent. Remove the sump from the bottom of the air cleaner, drain the oil, and wash the sump thoroughly. Fill the sump with oil as indicated above (Industrial Engines). Remove the mesh-type filter element from the body of the air cleaner, and wash it in solvent. (Fig. 6)

Crankcase Ventilating System

Wash the crankcase breather cap, located on the right rocker arm cover, in solvent. Oil the wire mesh in the cap with light engine oil. This operation is particularly important when the engine is being operated under severe Dust conditions.

Battery

The battery supplies current to the starter and electrical system while starting the engine. After the engine starts, the generator supplies all of the current needed to keep the engine running, and also replenishes the current supply drained from the battery during starting.

Each 50 hours fill the battery to the ring with distilled water or clean rain water. The battery terminals should be kept tight and free of corrosion. A solution of two tablespoons of baking soda to a pint of water makes an excellent cleaning agent for corroded battery terminals and a dirty battery case. Apply the solution with a paint brush or whisk broom, and thoroughly flush the outside of the battery with clean water when finished. Coat the battery terminals with light grease or petroleum jelly to inhibit corrosion.

The state of charge of the battery is indicated by the specific gravity of the battery solution. Check the specific gravity with a hydrometer, then refer to table 1 to determine the condition of the battery. A battery which is used in tropical climates, where freezing rarely occurs, is supplied with a weaker acid solution, therefore the different specific gravity values. A high specific gravity affords the best protection against freezing. A difference in specific gravity between cells of 20% indicates battery trouble and the possibility of early failure especially in cold weather.

Rapid loss of battery solution is an indication that the battery is being overcharged. The generator and voltage regulator should be checked and adjusted to provide the specified output.

TABLE 1 – SPECIFIC GRAVITY CHART

Specific Gravity Temperate Climates	State of Charge	Specific Gravity Tropical Climates
Above 1.280	Fully Charged	Above 1.225
1.250	75%	1.200
1.220	50%	1.175
1.190	25%	1.150
1.160	Limited Useful Capacity	1.120
1.130 or less	Discharged	1.090 or less

Distributor

On units without optional tachometer installation, lubricate distributor oiler with engine oil. On units with tachometer, lubricate distributor zerk fitting. Use Ford lubricant #C1AZ-19590-B or any other good grade of chassis grease. Use a low pressure grease gun only.

EACH 100 HOURS

After each 100 hours of operation, your unit will require the following services if long life and efficient operation are to be expected.

Perform all 50 hour maintenance procedures as listed on pages 16-19.

Crankcase

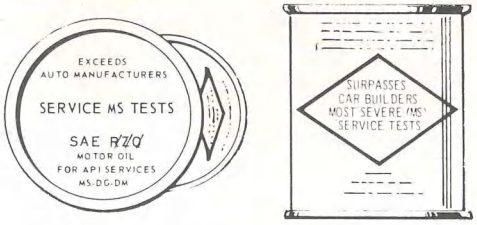
Drain the engine oil with the engine at normal operating temperature. Fill the crankcase with the proper quantity and viscosity of MS-type oil (Table 2). The crankcase capacity is 3 quarts (91 and 104 V-4 engines) or 4 quarts (122 V-6 engine), plus an additional 1/2 quart when changing the filter.

TABLE 2 – ENGINE OIL RECOMMENDATIONS

Viscosity to Use	At Atmospheric Temperature
SAE 40 Only	Above +100°F.
SAE 30 or 20W-40	+32°F. to +100°F.
SAE 20 or 10W-30	-10°F. to + 32°F.
SAE 10W or 5W-20	-10°F. & Below

LUBRICANT SPECIFICATIONS

Engine Crankcase Oils



Container should be labeled as above

The oil used must meet Ford Spec. #M2C101-B and Military Spec. #MIL-L-2104-B. Oil that meets this specification is normally marked so on the can. Rotunda Oil meets all specifications for Ford Industrial Engines, and provides an extra margin of safety when used with an Autolite Oil Filter. If engine oils are used which do not meet the requirements, it will be necessary to change oil more frequently than specified to obtain satisfactory engine life and operation. Ford Rotunda Oil Conditioner (Part #C2AZ-19579-A) can be added to crankcase oils that do not meet the MS-type specifications. This additive will upgrade the oil to meet the necessary requirements.

Oil Filter

The engine oil filter is important in preserving the internal condition of your engine. Your new engine is equipped with an Autolite Oil Filter which should be changed every 100 hours, or sooner if conditions warrant. For reliable service, you should always use a genuine Autolite replacement filter. It is designed to protect your engine by filtering all harmful abrasive or sludgy particles without clogging up and blocking the flow of oil. The exclusive two stage filtering action of the Autolite replacement filter has been shown by tests to be far more effective in over-all ability to keep the oil clean, removing particles even finer than talcum powder.

To replace this filter proceed as follows: Place a small drain pan under the filter and loosen approximately one turn (counterclockwise) and drain. When excess is drained off, remove filter and dispose. Completely clean off all old oil and dirt from around mating surface at block. Take a new filter and coat the rubber seal with oil. Then screw on the new filter until the oiled rubber seal is in contact with the cylinder block, then tighten it one half (1/2) turn more.

Bring oil to full mark if necessary, then operate the engine at a fast idle and check for oil leaks. If an oil leak is evident, stop the engine and remedy cause.

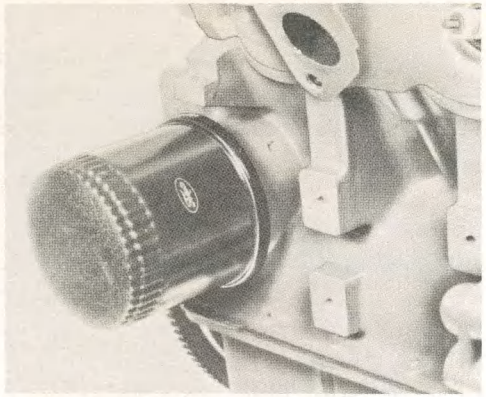


Fig. 7 – Oil Filter Installation

Power Take-Off

The complete lubrication instructions for the power take-off are given on the patent plate attached to the power take-off clutch housing. Follow these instructions carefully when lubricating this unit. Clean fittings before and after greasing. Use Autolite lubricant #C1AZ-19590-B or any other good grade of chassis grease. Use a low pressure grease gun only.

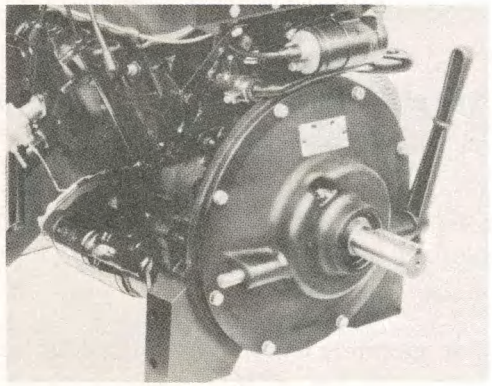


Fig. 8 – Power Take-Off

Inspections

Check all fuel lines and complete cooling system for any leaks. Look for any visible oil leaks. Remedy any leaks found. Check and tighten if needed the following: carburetor, generator, governor, fuel pump and exhaust manifolds.

Valve Lash

Check and adjust the valve lash to .016" (intake & exhaust) hot. See page 30 for this adjustment. If needed, remove old gasket from rocker arm covers and clean gasket surface. Install new rocker arm cover gaskets.

Belts

Adjust belts to approximately 1/2 inch deflection, at longest belt span.

Generator

Sealed, self-lubricating generator.

Distributor and Distributor Points

Remove distributor cap and clean if needed. Clean rotor if needed. Check condition of distributor points. If badly pitted, replace. See pages 33, 35 and 36 for distributor point replacement. Check and set dwell and initial spark advance. Lubricate distributor as per page 19. (See specifications, page 42).

Compression Pressure

Check compression pressures with engine hot and carburetor at W.O.T. Pressures will run anywhere from 128-142 psi. See Page 31 and 32 for further details.

Spark Plugs

Remove spark plugs. Clean and regap to .024-.028". Reinstall spark plugs with new gaskets and torque to 20-25 ft. lbs.

Governor

Check oil level, fill to proper level if needed. Use MS, H.D. SAE 10W-30 oil only.

Idle Speed

With engine at operating temperature, adjust for best idle mixture, then set idle speed to 700-850 RPM.

EACH 500 HOURS

In addition to maintenance performed at each 50 and 100 hours, the following maintenance will be performed:

Fuel Filter

Remove and replace with a new filter.

Spark Plugs

Remove spark plugs and dispose. Install new AE 22 spark plugs gapped and torqued to specifications, refer to page #32-33.

Distributor Points

Remove distributor points and dispose. Install new points (lube-cam) and set dwell and initial spark advance to specifications. Refer to page # 33 and 35.

EACH 1,000 HOURS

In addition to maintenance performed at the previous intervals the following maintenance will be performed:

Cooling System

The cooling system is designed to provide adequate cooling under all normal operating conditions. Proper care of the cooling system is highly essential in any engine, however, in a stationary engine strict attention to cooling system maintenance cannot be overemphasized. A stationary engine depends entirely on the rate of coolant flow and the ability of the fan to draw air through the radiator for efficient heat dissipation. Its cooling is not assisted by forward motion.

If the cooling system becomes restricted, or the thermostat, fan, or water pump become inoperative, the engine will overheat. Loss of coolant through a cylinder head gasket or external leaks, or loss of pressure through the radiator cap will also cause overheating.

Drain all coolant by opening the drain cock near the bottom of radiator and by removing the engine block drain plugs as shown on Figs. 9 and 10. Allow all coolant to drain. If coolant drained appears contaminated, flush system with fresh water until water flow from radiator and block is clear. Reinstall drain plugs into block and close drain cock on radiator. Check all hoses and connections for leaks. If any of the hoses feel spongy or look expanded, they should be replaced. Replenish coolant with equal parts of Autolite Long Life Coolant Concentrate #8A-19549-A and tap water. (50/50 mixture, 3-1/4 quarts of concentrate #8A-19549-A and 3-1/4 quarts of water for a total fill of 6-1/2 quarts.) Also add one can of Radiator Rust Inhibitor. Fill system to approximately one-half (1/2) inch below the bottom of the filler neck. After the initial fill, the coolant level may drop approximately one pint, after the engine has been

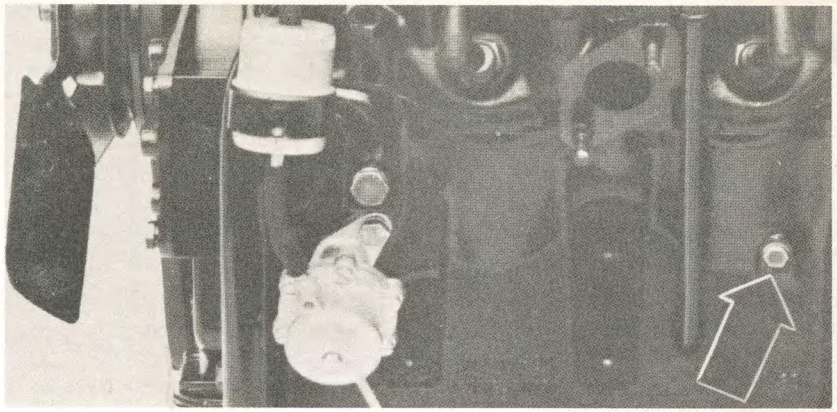


Fig. 9 — Block Drain Plug— Left

operated about 20 minutes at 2,000 RPM. This is due to the displacement of entrapped air. Add more concentrate to bring to proper level. After completing this procedure, the cooling system will be protected to -35° F and at the same time permits the engine to operate at temperatures up to 240° F.

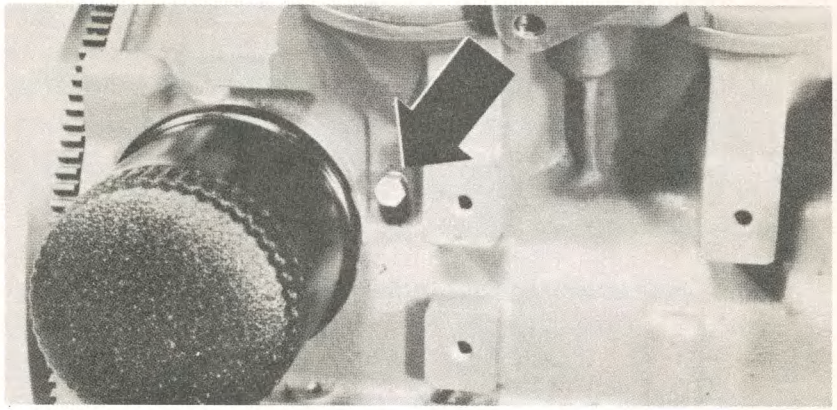


Fig. 10 — Block Drain Plug— Right

In an emergency, other reputable brands of permanent anti-freeze with an ethylene glycol base may be added with an equal part of water and a can of good corrosion inhibitor.

Make up coolant should be of equal parts of concentrate and water or the desired cold weather protection will be limited. It is also a good policy in freezing weather to have the degree of anti-freeze protection checked.

SEASONAL

In spring and fall, certain measures should be taken to ensure efficient operation of your unit during the coming season. If your unit is to be stored during the coming season, follow the storage instructions on pages 12 and 13.

Spring

Engine Oil: Change to the viscosity of oil for the highest anticipated ambient temperature for the next 100 hours of operation.

Fall

Engine Oil: Change to the viscosity of oil for the highest anticipated ambient temperature for the next 100 hours of operation.

NOTE: *If lower than anticipated ambient temperatures are encountered (sub cold snap), the next lower viscosity of oil will be needed in the engine or difficulty will be encountered in cold starting the engine. This is particularly true of - 10°F and lower.*

Coolant: Check the degree of anti-freeze protection. A - 35°F protection is desired.

Battery: Check the condition of battery and all electrical connectors. Remedy any condition that is below par.

MAINTENANCE SCHEDULE

	First 15 Hours	Day To Day	Each 50 Hours	Each 100 Hours	Each 500 Hours	Each 1000 Hours
Torque Cylinder Heads	X					
Torque Intake Manifold	X					
Torque Oil Pan Screws	X					
Torque Rocker Arm Stands	X					
Lash Valves	X			X		
Tighten Carburetor, Fuel Pump and Exhaust Manifolds	X					
Check Coolant Level		X				
Set Dwell and Initial Spark Adv. (Distributor)	X			X		
Check Oil Level		X				
Change Engine Oil & Oil Filter	X			X		
Set Idle Speed	X			X		
Retighten Belts	X			X		
Check and Maintain Oil Level in Governor			X			
Service Air Cleaner			X			
Service Crankcase Vent			X			
Service Battery			X			
Lube Distributor			X			
Lube Power Take Off				X		
Special Leak & Bolt Tightness Inspection – Page #20				X		
Check Compression Pressures				X		
Check Spark Plugs				X		
Check Condition of Distributor Points				X		
Change Fuel Filter					X	
Change Distributor Points					X	
Change Spark Plugs					X	
Change Coolant						X

Minor Repairs and Adjustments

Cylinder Head Bolt Torque Procedure

To torque the cylinder head bolts after the initial 15 hours of operation, torque to 60 ft. lbs., following the sequence shown on Fig. #11.

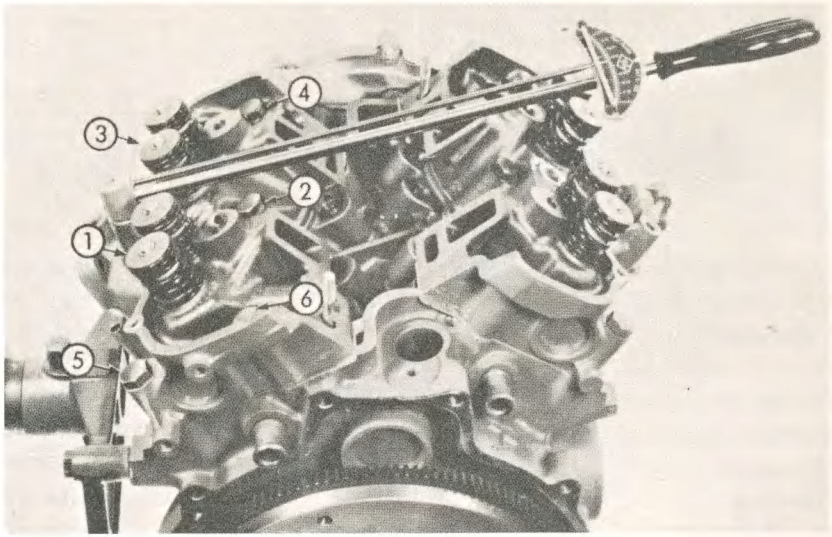


Fig. 11 – Cylinder Head Torque Sequence

If the cylinder heads were removed and are to be reinstalled, the following procedure will apply:

Clean the cylinder head and cylinder block gasket surfaces. Apply sealer to both sides of cylinder head gaskets. Position the new cylinder head gasket over the dowels on the block. Oil the threads on the head bolts. Position the cylinder head to the block and install the head bolts. The cylinder head bolts are then tightened in three progressive steps. Torque all the bolts in sequence (Fig. #11) to 40 ft-lbs, then 50 ft-lbs and finally to 60 ft-lbs.

Intake Manifold Bolt Torque Procedure

To torque the intake manifold bolts after the initial 15 hours of operation, torque to 21 ft-lbs, following the sequence shown on Fig. #12. NOTE: *This operation will always follow the cylinder head bolt torque, if the cylinder heads were torqued.*

If the intake manifold has been removed and is to be reinstalled, the following procedure will apply:

Clean the mating surfaces of the intake manifold, cylinder heads and cylinder block with solvent and scraper. Apply sealer to the cyl-

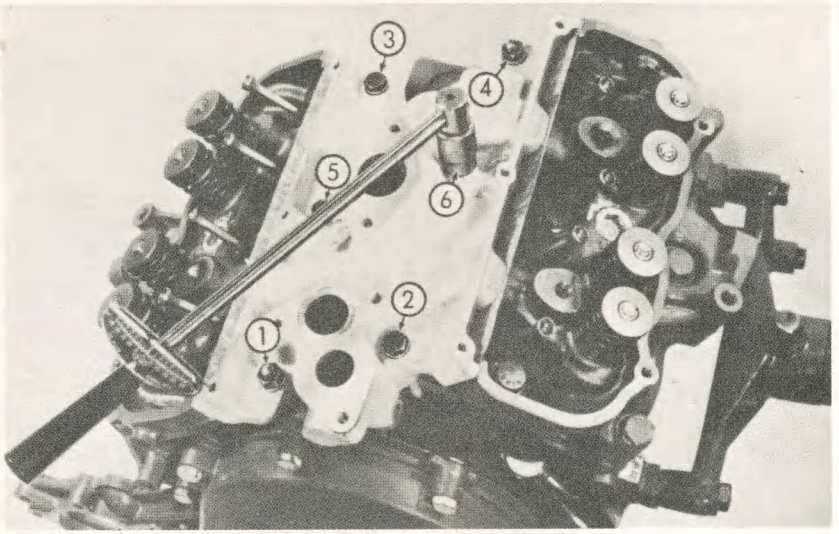


Fig. 12 – Intake Manifold Torque Sequence

inder heads as illustrated in Fig. #13. Install the intake gasket over the cylinder head studs (Fig #14). Install the intake manifold onto the cylinder head studs and align manifold. Apply sealer to the intake manifold bolts and nuts and install. The intake manifold is then tightened in four progressive steps. Torque in sequence (Fig. #12) to 6 ft-lbs, to 11 ft-lbs, then to 16 ft-lbs and finally to 21 ft-lbs.

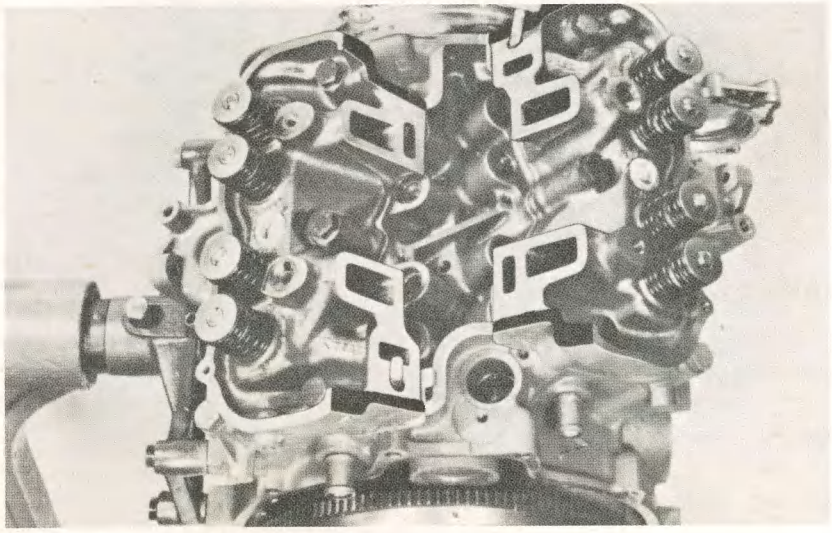


Fig. 13 – Sealer Application

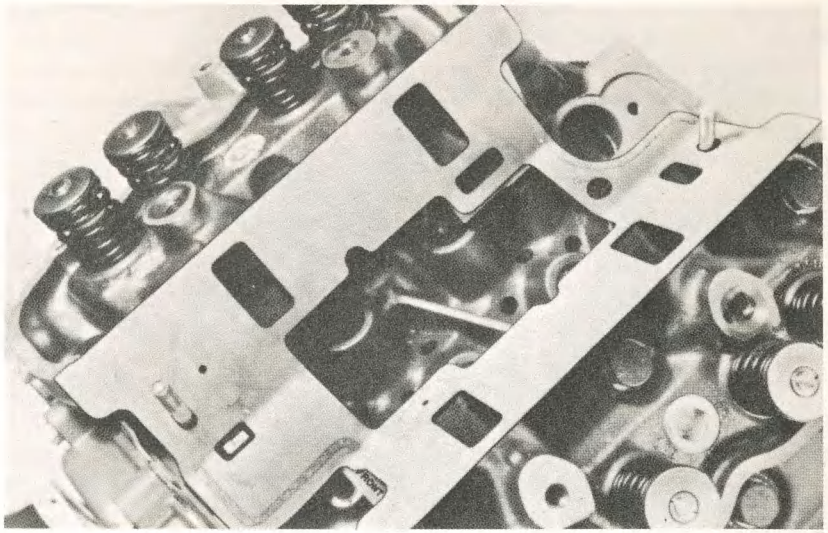


Fig. 14 – Intake Manifold Gasket Placement

Valve Lash (and rocker arm stand torque) Procedure

After the initial 15 hours of operation and before the valves are lashed, torque the rocker arm stand bolts to 35 ft-lbs.

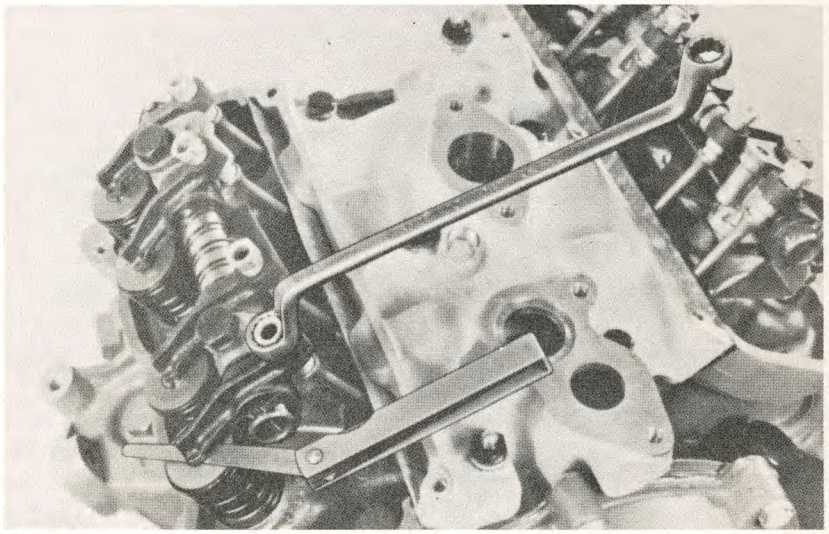


Fig. 15 – Valve Lash

To lash the valves, the engine should be at operating temperature, midway on the green band so that the valves can be lashed to the

.016" hot specification. This adjustment can be accomplished with the engine stopped. The valves are adjusted by positioning each piston on T.D.C. at the end of the compression stroke, in the firing order sequence (1-3-4-2). First rotate the engine (manually turn the crankshaft) to position #1 cylinder near T.D.C. at the end of the compression stroke, so that both valves for #1 cylinder are in their closed or rocking position. Adjust these valves.

A more accurate method of adjusting the valves, is to use a "go" and "no go" procedure. For example, if the valve lash is .016", use a .015" gauge for *"go"* and .017" for *"no go."* The "go" gauge should enter and the "no go" gauge should not enter. The resultant setting will be the required setting (.016"). There are stepped gauges available to make this adjustment easier. When the valves for #1 cylinder have been adjusted, perform the same procedure with the remaining cylinders, after each has been brought to their T.D.C. compression stroke positions.

This procedure should be followed for either the preliminary cold setting of .18" or the final hot setting of .016". NOTE: *If needed, replace the rocker arm cover gaskets, each time the valves are lashed.*

Compression Pressures

The first step in any engine tune-up should be a careful check of the compression pressure of each cylinder. An engine with uneven compression cannot be properly tuned and will not provide the performance desired until the cause of the uneven compression is corrected. Use the following procedure to perform a thorough compression test:

Operate the engine at fast idle speed for a minimum of 20 minutes to assure that it is thoroughly warmed.

Turn off the ignition, then pull the throttle control to the full open position and lock it. Remove all the spark plugs from the engine.

Install a compression gauge in a spark plug hole, and crank the engine, about ten revolutions, with the starter. Write down the gauge reading.

Repeat the check on all cylinders, then compare the gauge readings. The compression pressures should be 128-142 pounds. The reading on all cylinders should be the same within 20 pounds. If any one cylinder has a pressure of 118 psi or lower this is an indication of possible trouble.

If the compression pressure is low on two adjacent cylinders, the possibility of a leak between the two cylinders is indicated. Such a leak is usually caused by a head gasket which is not sealing proper-

ly. If the compression pressures on all cylinders are low, or vary a great deal, the cause of the trouble can be narrowed down by squirting a liberal quantity of engine oil through the spark plug holes on top of the pistons of the low reading cylinders. Then crank the engine a few revolutions to get the oil evenly distributed on the cylinder walls, and make a second compression test. If there is very little difference between the readings obtained in the two checks, sticking or poorly seating valves are indicated. However, if the readings on the low cylinders have improved considerably, it indicates the compression is being lost past the rings.

Spark Plugs

This engine is equipped with Autolite AE22, 14 millimeter spark plugs. Under normal conditions these spark plugs will give the expected performance with normal maintenance listed in this manual:

To insure excellent engine performance and minimize the possibility of spark plug misfiring, the spark plugs should be cleaned, tested, and gapped at least every 100 hours of operation.

Loosen the spark plugs one full turn, then blow any accumulation of dirt out of the spark plug wells before completing the removal.

Remove carbon and other deposits from the threads with a stiff wire brush. Any deposits will retard the heat-flow from the plug to the cylinder head, causing spark plug overheating and pre-ignition.

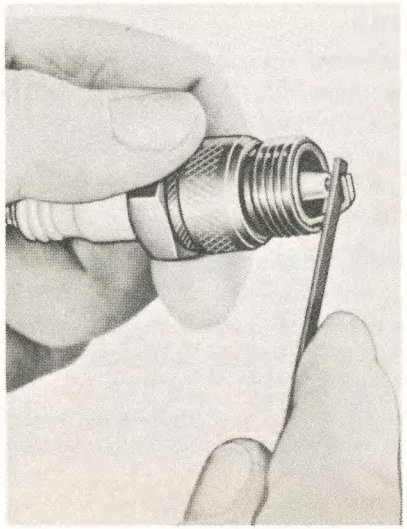


Fig. 16 — Dressing Plug Electrodes

Clean any heavy carbon deposits from the plugs with a thin bladed knife, then finish cleaning them with an abrasive type cleaner. Use the abrasive type cleaner sparingly as excessive blasting with abrasive may damage the porcelain around the center electrode. If the porcelain is badly glazed or eroded, replace the spark plugs.

Clean the electrode surfaces with a small file (Fig. #16). Dress the electrodes to secure flat parallel surfaces on both the center and side electrode.

After cleaning, examine the plug carefully for cracked or broken insulators, badly eroded electrodes and other signs of failure. Replace as required.

Examine the firing ends of the spark plugs, noting the type of deposits and the degree of electrode erosion. Refer to Fig.#17 for the various types of spark plug fouling and their causes.

Adjust the spark plug gap to .024-.028" with a round wire type gauge, by bending the outside electrode. If old spark plugs are reused, install with new gaskets. Torque to 20-25 ft-lbs.

NOTE: *Do not overtighten spark plugs. The gap may change considerably due to distortion of the plug outer shell.*

Distributor and Ignition Timing

Performance, fuel economy and life expectancy of the engine, largely depend on the correct distributor adjustment.

The distributor point dwell and the initial spark advance will be checked and reset if needed, after the initial 15 hours and at the completion of each 100 hours.

If excessive fuel consumption, poor performance or overheating of the engine is encountered, the distributor adjustments should be checked.

Dwell Angle or Breaker Point Gap Adjustment— Used Breaker Points

If the gap of used breaker points are being checked, use a dwell meter to check and set the points. It is not advisable to use a feeler gauge to adjust or check the gap of used breaker points. The normal roughness of the contact surfaces, make an accurate gap check or setting impossible. If needed, clean the contact surfaces. Check the dwell angle and reset if needed. (See Engine Tune Specifications, page 42.)

Installation of New Breaker Points

Remove old distributor points. Install a new point set and apply a light film of distributor cam lubricant to the cam. Use a grease that

CONDITION	IDENTIFICATION	CAUSED BY
 OIL FOULING	Wet, sludgy deposits.	Excessive oil entering combustion chamber through worn rings and pistons, excessive clearance between valve guides and stems, or worn or loose bearings.
 GAS FOULING	Dry, black, fluffy deposits.	Incomplete combustion caused by too rich a fuel-air mixture or by a defective coil, breaker points or ignition cable.
 BURNED OR OVERHEATING	White, burned, or blistered insulator nose and eroded electrodes.	Inefficient engine cooling, or engine overheating caused by improper ignition timing, wrong type of fuel, loose spark plugs, or too hot a plug, low fuel pump pressure.
 NORMAL CONDITIONS	Rusty brown to grayish-tan powder deposit and minor electrode erosion.	Regular or unleaded gasoline.
 NORMAL CONDITIONS	White, powdery deposits.	Highly leaded gasolines.
 CARBON FOULING	Hard, baked on black carbon.	Too cold a plug. Weak ignition, defective fuel pump, dirty air cleaner, too rich a fuel mixture.
 SILICONE DEPOSIT	Hard and scratchy	Formed when fine sand particles combine with anti-knock compounds in the fuel. Most common industry areas. The plugs cannot be cleaned.
 SPLASHED FOULING		Deposits, accumulated after a long period of misfiring, suddenly loosened when normal combustion chamber deposits are restored after new plugs are installed. During a high speed run these deposits are thrown into the plug.

Fig. 17 – Spark Plug Inspection

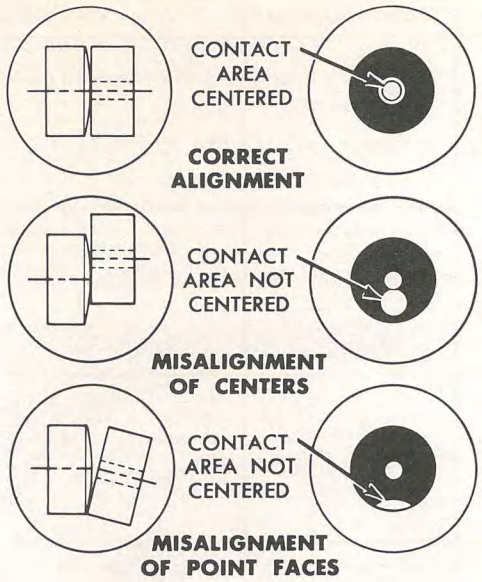


Fig. 18 – Breaker Point Alignment

meets Ford Motor Company specification #M-1C-66-A or C4AZ-19D530-A, or a good high temperature No. 2 grade sodium soap grease. Do *not* use engine oil. Align new points as follows:

The vented-type breaker points must be accurately aligned and strike squarely in order to realize the full advantage provided by this design, and assure normal breaker point life. Any misalignment of the breaker point surfaces will cause premature wear, overheating and pitting.

1. Turn the cam so that the breaker points are closed and check the alignment of the points (Fig. #18).
2. Align the breaker points to make full face contact by bending the stationary breaker point bracket. Do not bend the breaker arm.
3. After the breaker points have been properly aligned, adjust the breaker point gap or dwell.

Dwell Angle or Breaker Point Gap Adjustment– New Breaker Points

New breaker points can be adjusted with a feeler gauge, or a dwell meter.

To adjust the breaker points with a feeler gauge:

1. Rotate the distributor cam until the rubbing block rests on the peak of a cam lobe.

2. Insert the correct blade of a clean feeler gauge between the breaker points. The gap should be set to the larger opening (see Engine Tune Specifications, page 42) because the rubbing block will wear down slightly while seating to the cam.

To adjust the breaker points with a dwell meter, set the contact dwell to the low setting. New points must be set to the low dwell value, as the rubbing block will wear down slightly while conforming to the cam.

See the ignition timing after the above adjustments.

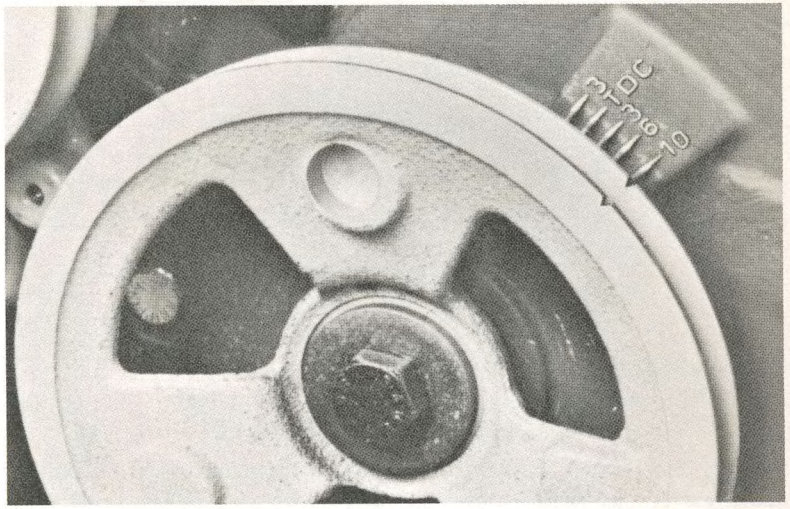


Fig. 19 — Timing Marks

Ignition Timing

The timing marks are located at the front of the engine. The timing marks are on a tab, on the front cover near the balance shaft pulley. The alignment pointer or mark, is notched into the balance shaft pulley.

The tab has five (5) timing marks ranging from 3° retard (ATDC), to 10° advance (BTDC).

To adjust ignition timing, align the notch on the balance shaft pulley with the proper mark on the tab. The normal initial spark advance setting for this engine with Standard Ford Vacuum Advance Distributor is 10° BTDC at 700 RPM with vacuum line disconnected. See Engine .Tune Specifications for settings with other than standard distributor.

For special Industrial Engine Applications, optimum spark advance settings may be used which will give better performance characteristics for a specific RPM range. To get this information contact your local Industrial Products Distributor.

Idle Speed

With clutch disengaged and engine at operating temperature, procede as follows:

1. Adjust idle speed to 700 RPM.
2. Adjust for best idle mixture.
3. Reset the idle speed to the smoothest point within the range of 700-850 RPM.
4. Recheck idle mixture adjustment and reset if needed.

GOVERNOR

DIAGNOSIS

General Information

In general, suspected governor malfunctions can usually be traced to improperly adjusted throttle linkage, binding in the linkage, incorrect governor adjustments, slipping drive belt, or low oil level in the governor. Always investigate all suspected causes as described in the Diagnosis Guide before replacing the governor.

There are two designs of governors in service, identified as a late design and early design. The early design governor is shown in Fig. #20 and the late design governor is shown in Fig. #21.

DIAGNOSIS GUIDE

SYMPTOM	PROBABLE CAUSE
INCONSISTENT IDLE SPEED	Governor-to-carburetor linkage binding. Carburetor throttle plate or shaft binding. Carburetor idle mixture needle(s) not adjusted properly or carburetor idle system not functioning properly. Governor no-load surge adjustment screw not adjusted correctly. (Late design governor only.) Governor oil level too low. Drive belt slipping. Governor defective.
INCONSISTENT HIGH SPEED OPERATION	Governor sensitivity adjustment not set properly. Governor-to-carburetor linkage binding. Carburetor dirty or not functioning properly. Governor drive belt slipping. Governor oil level too low. Governor no-load surge adjustment screw not adjusted properly.
ENGINE WILL NOT DEVELOP FULL POWER OR SPEED	Governor high-speed stop screw not adjusted correctly. Governor-to-carburetor throttle rod not adjusted properly to permit carburetor to move to wide open throttle position. Engine requires overhaul or ignition and fuel systems require adjustment or repair. Engine overloaded.

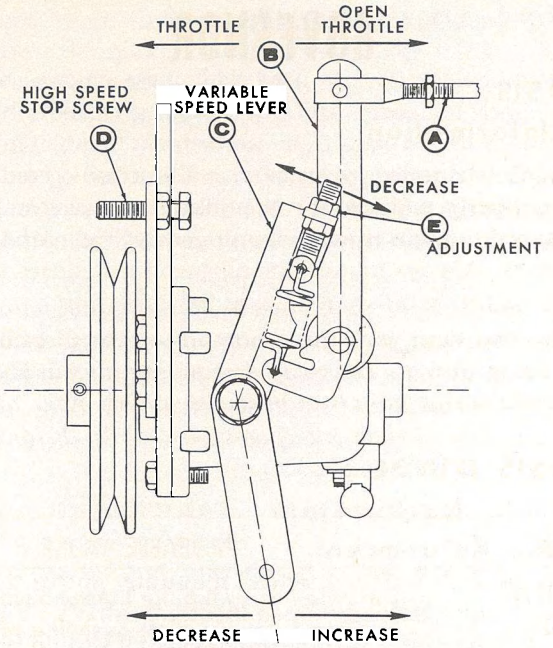


Fig. 20 – Governor Adjustment Points (Early Design)

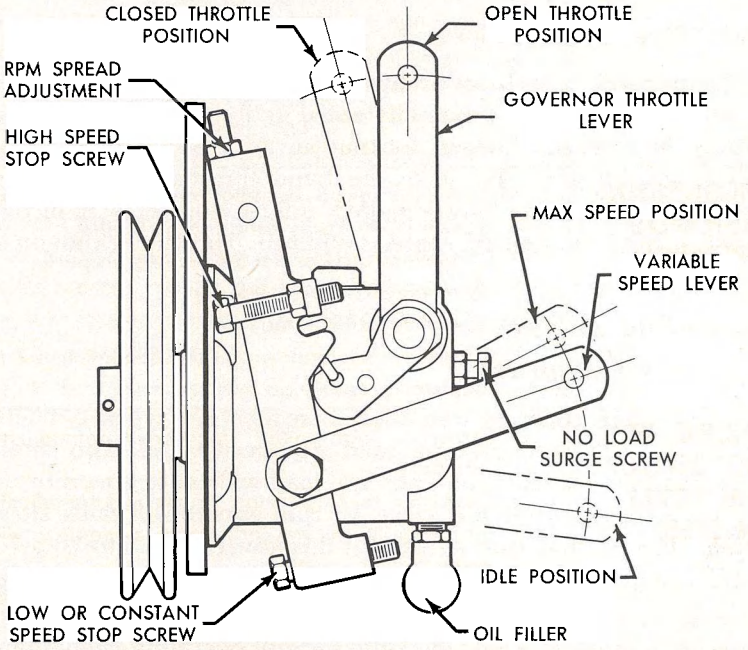


Fig. 21 – Governor Adjustment Points (Late Design)

GOVERNOR ADJUSTMENTS

The mechanical governors used with these engines have several adjustments. Both the early and late design governors have a high-speed adjustment and a sensitivity adjustment between full-load and no-load. The late design governor also has a low-speed adjustment and a no-load surge adjustment. In addition, on all installations, the length of the control rod between the governor and carburetor is adjustable.

NOTE: *The control rod length must be checked, and adjusted, if necessary, before making any governor adjustments. In addition, all governor and carburetor linkage must be free of binds and without play or the governor cannot be adjusted properly. Also, always check oil level in governor before making adjustments. If low, fill to level with MS-type 10W-30 engine oil.*

Governor-to-Carburetor

Control Rod Adjustment

With the control rod connected, manually move the governor throttle lever to the maximum open throttle position. (Figs. #20 and #21) Check the carburetor throttle shaft lever. It should be positioned 1/32 inch from its maximum open position. If necessary, adjust length of control rod to obtain this setting.

High-Speed Adjustment

Temporarily attach an accurate tachometer to the engine. Start the engine and run at a fast idle speed until normal operation temperature is reached. Loosen locknut on governor high-speed stop screw (Figs. #20 and #21). With the hand throttle in the maximum speed position and the load engaged, adjust stop screw in or out as necessary until the desired speed is attained. Tighten locknut on stop screw.

Sensitivity or RPM Spread Adjustment

For proper governor operation there must always be a difference between the full-load and no-load governed speed. Too small an rpm spread between full-load and no-load will cause governor hunting and surging, while too large an rpm spread will cause slow response. The normal rpm spread for this governor is 5 to 10 percent.

To stabilize governor operation and prevent hunting and surging under load, it is necessary to increase the rpm spread. Start the engine and operate at a fast idle until normal operating temperature is reached. With the load disconnected, adjust hand throttle or governor

variable speed lever until maximum desired governed speed is obtained. Loosen the rpm spread adjusting nut (Figs. #20 and #21), until engine speed decreases 150 rpm. Tighten jam nut. Recheck governor under full-load and no-load conditions to determine if operation is stabilized and sensitivity is satisfactory. If necessary, repeat the adjustment procedure until correct governor operation is obtained. It also may be necessary to readjust governor high-speed stop screw to maintain the correct high-speed setting under load.

To decrease the rpm spread and obtain faster governor regulation the above procedure must be reversed, running the engine under no-load at the maximum governed speed and tightening the rpm spread adjusting nut until engine speed increases 150 rpm. If hunting occurs under load, decrease the sensitivity by loosening the rpm spread adjusting nut until the hunting stops. *Do not use the no-load surge screw to correct hunting under load.*

Low-Speed Adjustment (Late Design Governors)

Start the engine and operate at a fast idle speed until normal operating temperature is reached. Move hand throttle to the closed position. Loosen locknut on governor low-speed screw (Fig #21) and turn stop screw in or out as necessary to maintain desired speed.

NOTE: *If the absolute minimum idle speed is desired, adjust the governor stop screw in until no further decrease in engine speed is apparent. Then adjust the idle speed adjustment screw on the carburetor to maintain an engine speed of 700-750 rpm.*

No-Load Surge Adjustment (Late Design Governors)

The no-load surge adjustment is set at the factory and rarely, if ever, requires adjustment. If necessary, the adjustment can be used to prevent hunting and surging at no-load speeds, providing the rpm spread adjustment is set properly. If hunting or surging at no-load is encountered, loosen the surge adjustment screw locknut and turn the screw inward until speed stabilizes. Do not turn screw in any further than necessary.

CAUTION: *Turning the no-load surge adjustment screw in all the way will interfere with proper governor operation and prevent the governor from returning the engine to idle speed.*

ENGINE TUNE SPECIFICATIONS

GENERAL

Engine Models and Displacement (Cubic Inches)
- 91 V-4 . . . . . 91.5
- 104 V-4 . . . . . 103.7
- 122 V-6 . . . . . 121.9

Bore and Stroke (Inches)
- 91 V-4 . . . . . 3.54 x 2.32
- 104 V-4 . . . . . 3.54 x 2.63
- 122 V-6 . . . . . 3.31 x 2.37

Compression Ratio – 91 V-4 . . . . . 8.0 to 1 Nominal
– 104 V-4 and 122 V-6 . . . . . 9.0 to 1 Nominal

Compression Pressure – PSI
- At Cranking Speed 128-142
- Allowable Tolerance Between Cylinders . . . . . 20 psi

Firing Order
- 91 and 104 V-4 1-3-4-2
- 122 V-6 1-4-2-5-3-6

Idle Speed . . . . . 700-850 rpm

Initial Spark Advance
- With Ford Vacuum Advance Distributor . . . . . 10° BTDC
- With Ford Tach Drive Distributor . . . . . 14° BTDC
- With Bosch Distributor . . . . . 6° BTDC
- With Propane or Natural Gas . . . . . 12° BTDC

Manifold Vacuum at Idle (Inches of Mercury) 17

Oil Capacity*
- 91 and 104 V-4 . . . . . 3 qts.
- 122 V-6 . . . . . 4 qts.

* Add 1/2 quart when changing filter.

CYLINDER HEAD

Gasket Surface Flatness . . . . . .003" in any 6 inches

VALVE MECHANISM

Valve Lash . . . . . .018" cold; .016" hot

IGNITION TIMING (at 750 rpm with vacuum disconnected)

- V-4 Engines with Vacuum-Advance Distributors . . . . . 10° BTDC
- V-4 Engines with Ford Centrifugal Advance Tach-Drive Distributors . . . . . 14° BTDC
- All Engines with Bosch Distributors . . . . . 6° BTDC

BREAKER POINT GAP SPACING

- V-4 Engines with Ford Vacuum-Advance Distributors . . . . 0.024-0.026 inch
- V-4 Engines with Ford Centrifugal-Advance Tach-Drive Distributors . . . . . 0.024-0.026 inch
- V-4 Engines with Bosch Distributors . . . . . 0.016-0.020 inch
- V-6 Engines with Bosch Distributors . . . . . 0.012-0.015 inch

BREAKER POINT DWELL

- V-4 Engines with Ford Vacuum-Advance Distributors . . . . . 32°-36°
- V-4 Engines with Ford Centrifugal Advance Tach-Drive Distributors . . . . . 38°-40°
- V-4 Engines with Bosch Distributors . . . . . 48°-52°
- V-6 Engines with Bosch Distributors . . . . . 36°-40°

CARBURETOR APPLICATION

- C3PV and C6PV 91 V-4 Engines . . . . . Solex 28 PDSI (Manual Choke) or Solex 32 PDSIT-4 (Automatic Choke)
- C5PJ 104 V-4 . . . . . Solex 32 PDSIT-4 (Automatic Choke)
- C5PK 122 V-6 . . . . . Solex 32 DDIST (Automatic Choke)

CARBURETOR DATA

Solex 28 PDSI (Manual Choke)
- Main Jet No. 115
- Venturi Size . . . . . 21.8 mm (.859")
- Air Jet No. 115
- Idle Jet No. 42.5
- Engine Idle Speed . . . . . .750 rpm

Solex 32 PDSIT-4 (Automatic Choke)

	C3PV, C6PV 91 V-4	C5PJ 104 V-4
Main Jet No.	X125	X135
Venturi Size	26 mm (1.023")	27 mm (1.062")
Air Jet No.	110	130
Idle Jet No.	45	45
Engine Idle Speed	750 rpm	750 rpm
Fast Idle Speed	2000-2200 rpm	2000-2200 rpm

Solex 32 DDIST (Automatic Choke)
- Main Jet No. X125
- Venturi Size . . . . . 25.5 mm (1.030")
- Air Jet No. 100
- Idle Jet No. g40
- Engine Idle Speed . . . . . .750 rpm
- Fast Idle Speed . . . . . 2000-2200 rpm

FUEL PUMP

Pressure – psi 3.5-4.25

SPARK PLUGS

- Type . . . . . Autolite AE 22
- Gap . . . . . .024-.028 inch
- Torque . . . . . 20-25 ft.-lbs.
- Fuel Pump Pressure . . . . . .2.5-4.0 psi

COIL

Primary Winding Resistance at 75° F. . . . . 3.25-3.45 ohms
Secondary Winding Resistance at 75° F. . . . . 3.700-4.100 ohms

Metric-Inch Conversion Table

Fractional Inch	Decimal Inch	Millimeter
1	1.00000	25.4000
31/32	0.96875	24.6062
15/16	0.9375	23.8125
29/32	0.90625	23.0187
7/8	0.875	22.2250
27/32	0.84375	21.4312
13/16	0.8125	20.6375
25/32	0.78125	19.8437
3/4	0.750	19.0500
23/32	0.71875	18.2562
11/16	0.6875	17.4625
21/32	0.65625	16.6687
5/8	0.6255	15.8750
19/32	0.59375	15.0812
9/16	0.5625	14.2875
17/32	0.53125	13.4937
1/2	0.500	12.700
15/32	0.46875	11.9062
7/16	0.4375	11.1125
13/32	0.40625	10.3187
3/8	0.375	9.5250
11/32	0.34375	8.7312
5/16	0.3125	7.9375
9/32	0.28125	7.1437
1/4	0.250	6.3500
7/32	0.21875	5.5562
3/18	0.1875	4.7625
5/32	0.15625	3.9687
1/8	0.125	3.1750
3/32	0.09375	2.3812
1/16	0.0625	1.5875
1/32	0.03125	0.7937

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