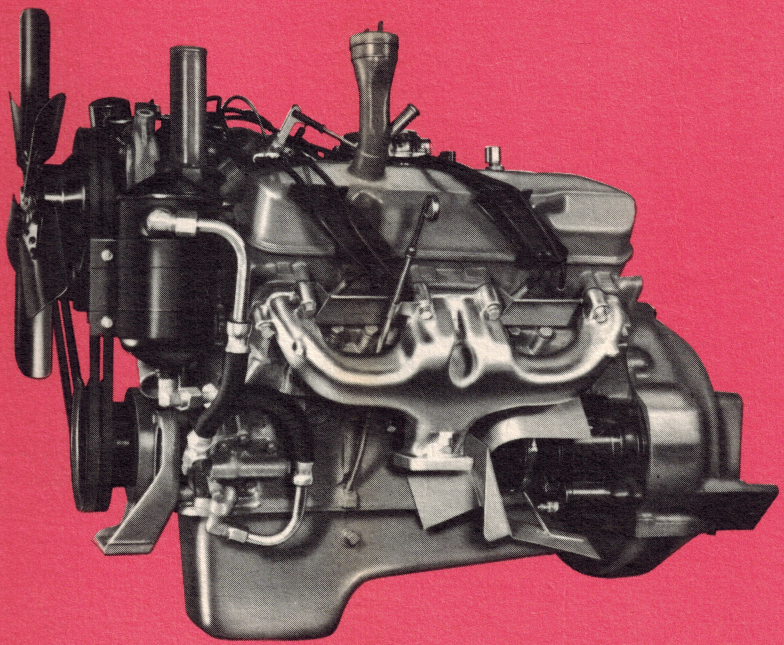
Chrysler

V-8 INDUSTRIAL ENGINES



H-SERIES MODELS

OPERATING MANUAL

81-770-7550

In trying to record facts about 1959 - 1967 industrial A-block poly 318 engines, I purchased a clean copy of this 1962 operating manual that was still in the original owner's envelope sent by Patterson Brothers Industrial-Irrigation Services of Hastings, Nebraska with $0.15 of stamps dated 1963. The envelope contained a supplement for running the engines on liquefied propane and natural gas, which I have included at the beginning of the manual.

The manual covers Chrysler Corporation Industrial Engine Division engines known as the "H-Series" including the A318, B361, and RB413.

Supplement to Operators Manual for Liquefied Petroleum or Natural Gas

818 West Third Street
Hastings, Nebraska

SUPPLEMENT TO OPERATORS MANUAL WHEN CHRYSLER INDUSTRIAL ENGINES ARE OPERATED ON LP OR NATURAL GAS FUEL

ENGINE OIL

At time of delivery, engine contains 20 weight regular oil which is to be drained after 50 hours. Use 30 weight regular motor oil until oil consumption drops to normal which is 1 quart to 1 1/2 quarts every 24 hours. Then go to 30 weight heavy duty oil. Oil should be changed every 100 hours.

CAUTIONS: Use 1 quart of 1879406 Engine Oil Supplement with every oil change.

Do not use combination weight oils such as 10 - 30, etc.

The engine oil level should be checked daily. The engine oil level indicator has two marks "Full" and "Add Oil". If the oil level is at "Add Oil" mark, or slightly below it, not more than one quart of oil should be added.

OIL FILTER

Oil filter should be changed every 200 hours of operation. Full flow filter means that all of the oil delivered under full pressure to the working parts of the engine goes through the filter before entering the oil passages. Not only does this type of filter assure a constant flow of clean oil to the engine, but it is constructed and installed in such a manner that it is impossible for the supply of oil to be cut off even though the oil filter becomes clogged.

AIR CLEANER

The air cleaner should be serviced at time of each oil change. If extreme dusty or sandy conditions exist, servicing may be necessary more often.

VALVES

Six cylinder engines and H-318 -V-8 engines are equipped with adjustable valve tappets. These should be checked periodically and should be adjusted according to tolerances listed in the owner's manual.

All other V-8 engines are equipped with bydraulic valve lifters and no adjustment is necessary.

STARTING

When starting a cold engine (whether new or not), avoid unnecessary acceleration during the warm-up period. Keep the throttle at a fast idle until normal operating

STARTING - CONT'D.

assure long engine life and maximum efficiency of operation. On engines equipped with LP fuel carburetion, start engines with full throttle and full choke. Depress safety switch button and start engine. Continue to depress safety switch button until oil pressure reaches 40 pounds. After engine has run a few seconds, close the throttle to one-fourth open position and push in choke button rapidly. Engine should then be running at approximately 1600 RPM. Let the engine warm up at this speed before putting it under load. On engines equipped with load-meter or safety vacuum gauge, it is necessary to flip the toggle switch to the start position before starting the engine and then flip it to the run position as soon as the engine is under full load. The engine will not start with this switch on the run position.

Use the same starting procedure on natural gas equipment as on LP engines. CAUTION: When engines is under full load, 4 to 8 ounces of natural gas pressure is required at the engine regular from the field regulator. In taking this pressure reading the gauge must be installed on the engine regulator.

SAFETY SWITCHES

Switches should be checked periodically to see that they function properly. No ignition switch is used. When engine is stopped, either by safety gauge or stop button, all electrical circuits are broken and the hour meter will stop within three minutes.

ENGINE SPEEDS

Six cylinder engines should operate from 1500 to 2200 RPM for greatest efficiency.

V-8 engines should operate from 2000 to 2650 RPM

It is good practise not to operate a new or rebuilt engine at more than 3/4 throttle for the first 8 to 10 hours. This low speed will permit the bearings to seat properly, and will allow the operator to familiarize himself with the controls and performance of the engine.

After a hard run, the engine should be allowed to idle for a few minutes before turning off the ignition. This will help prevent over-heating and back-firing.

Do not "lug" your engine. This causes excessive wear and fuel consumption. Operate at a speed which handles the load with ease. This engine is designed especially for use with LP or Natural Gas as a fuel. Do not attempt to run on a 10w octance fuel. The compression ration is too high for such fuel. Do not attempt to run the engine too lean.

TUNE UP DATA

Gap Settings

Spark plug gap for six cylinder models	.035
Spark plug gap for V-8 models	.028
Point gap for six cylinder models	.020

Spark plugs should be changed every 800 hours of operation. Use of plugs beyond this point will cause excessive fuel consumption and loss of power.

Timing

Advance to attain highest ROM at idle speeds. CAUTION: Do not advance to the extent that the engine "kicks" back against the starter at cranking speed.

Caution: Do not use timing indicator or light on LP or natural gas equipped engines

CAUTION: Do not use "grease" on distributor cam - use only recommended cam lubricants.

COOLING

Do not use rust resistor in engine equipped with cooling coils

STORAGE OF ENGINE

In preparing your engine for storage, the following is recommended:-

Drain the used oil from the crankcase and refill with new oil. Remove the oil filter element and replace with a new one. Add one quart of MoPar Engine Oil Supplement, Part no. 1879406, to the oil.

Start the engine and warm it up to operating temperature. Remove the oil bath air cleaner and run the engine at fast idle. Slowly pour one quart of Engine Oil Supplement into the carburetor until you have about one-fourth of a quart left. Flood the engine out with the remainder.

Remove the spark plugs, and with a squirt oil can, pour a liberal amount of MoPar Cylinder Lubricant, Part no. 1643272, in each cylinder. Turn the engine over several times with the starter to coat the cylinder walls.

Before replacing the air cleaner, close off the carburetor intake with rubber gasket material between the oil cleaner and carburetor. If this is not possible, replace the air cleaner and place a plastic cover over the air cleaner wrapping it with masking tape at the bottom.

Place plastic or other weatherproof material over the exhause pipes and tape it on. As a precaution, it is recommended that cans or metal caps be placed over the above. Seal breather caps and pipes and any other openings where air and moisture might enter.

The cooling system must be drained completely. Be sure to open all petcocks, one on each side of the block on V-8 engines and one on the left side of six cylinder engines. Open the petcock on the bottom of the radiator on engines with radiators. Remove the plug at the bottom of the cooling coil on engines with head exchangers. On engines using LP fuel, make certain that the vaporizer is completely drained. CAUTION: Be sure to replace any drain plugs that have been removed to prevent mice from nesting in the cooling system.

If it is at all possible, it is good practise to place the engine in a building for storage.

Should you use a tarp or store the power unit in a building, precautions should be taken to prevent mice from nesting on the engine and eating the wiring. Dichlorcide crystals may be sprinkled over it to prevent this. If the above is not available, moth balls may be used for short periods of time.

****

On models equipped with alternators it must be stressed that this is a negative ground circuit only and extreme caustion must be exercised to prevent expensive damage to the electrical circuits which can result from reverse polarity or excessive voltage caused by incorrectly installing a battery, attaching a battery charger or using a booster battery to start the engine.

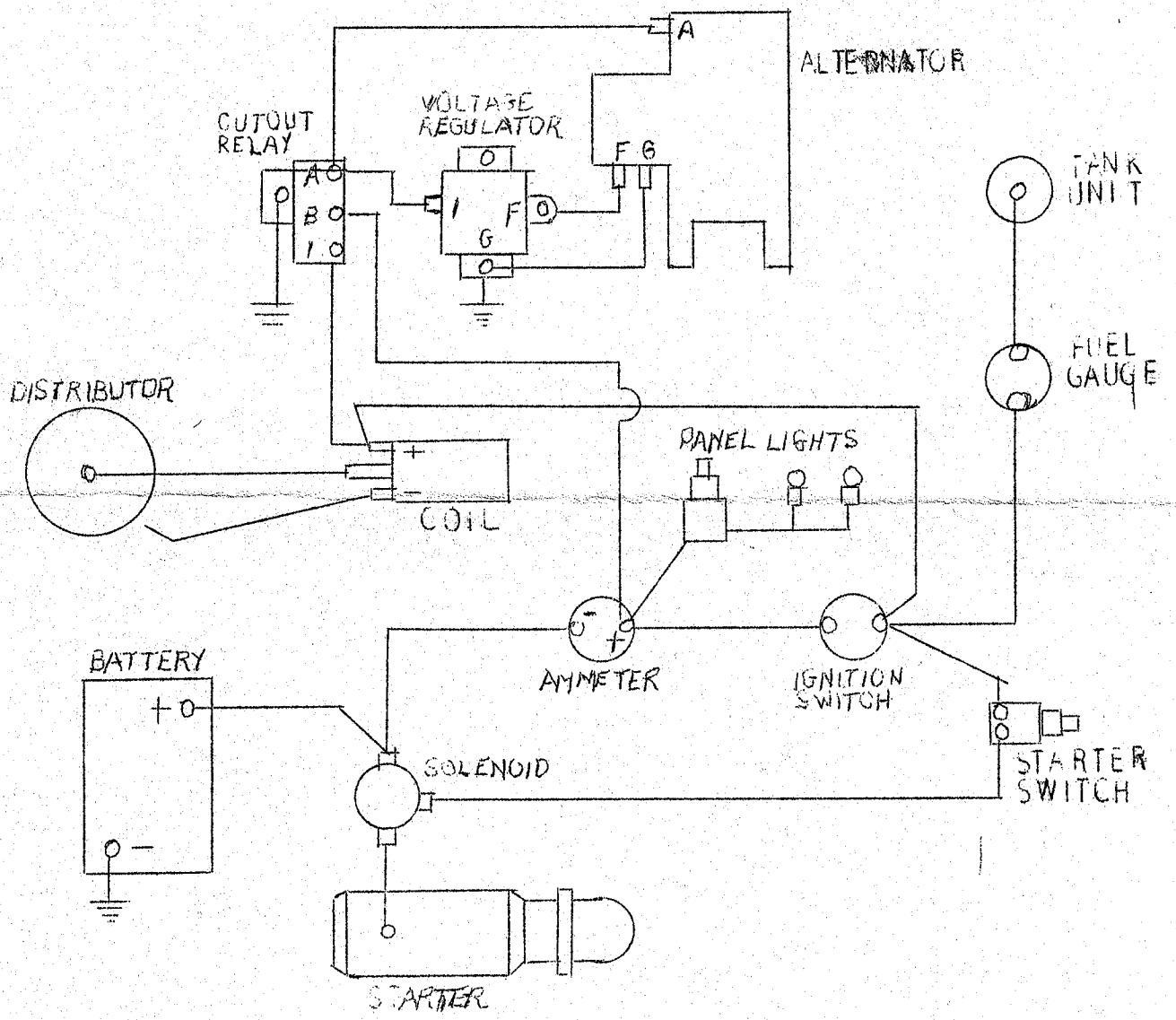
IMPORTANT: In all cases where a "Fast Charger" type battery charger is to be used, the two(2) battery cables must be disconnected from the battery - Never used a "Fast Charger" as a booster to provide starting voltage.

When using a booster battery the negative lead of the booster battery must be connected to the negative (ground) terminal of the battery and the positive lead to the postive perminal of the battery.

CAUTION: Reversing the polarity on an alternator system will immediately burn out the wiring harness and may possibly damage the alternator.

INDUSTRIAL-IRRIGATION SERVICES

WIRING DIAGRAM



CONTENTS

IMPORTANT

For your convenience, fill in the information requested below from your own engine. It will then be readily available when needed for identification purposes, should the replacement of parts ever become necessary.

Model .....

Type .....

Serial Number .....

SD & T — 5-63-10M
Litho in U. S. A.

81-770-7550

FOREWARD

This Operator's Manual is published as a guide and reference to assist the Owner in obtaining from the new Chrysler Industrial Engines, Models H, HB, HC, HC1, and HT, the power, performance and dependability built into all the Industrial Engines.

In order to obtain every advantage of these qualities over a period of time, it is suggested that you read the operating instructions completely, and handle your New Chrysler Industrial Engine accordingly.

The Authorized Chrysler Industrial Engine Dealers throughout the country will give you the best of service and attention in keeping your Industrial Engine at the peak of operating efficiency. These instructions if followed, will insure dependable operation, performance and complete satisfaction.

MODIFICATIONS

There may be slight modifications in the design of the Engine as dictated by field experience or a desire to improve the engine; or changes of material may become necessary due to the inability to procure those originally specified. If such changes become obvious, then wherever possible, parts or assemblies will be made interchangeable with the original design.

ILLUSTRATIONS

The illustrations and line drawings in this Operator's Manual are intended to show the owner various parts and constructions of the engine. In some instances the shapes or details of the parts illustrated may not exactly represent their actual appearance; however, they are being used to show the servicing methods or operation of the parts performing the same function.

IDENTIFICATION

A brass name plate is attached to the rear side of the left cylinder head (Figure 1) showing the model, type and serial number of the engine.

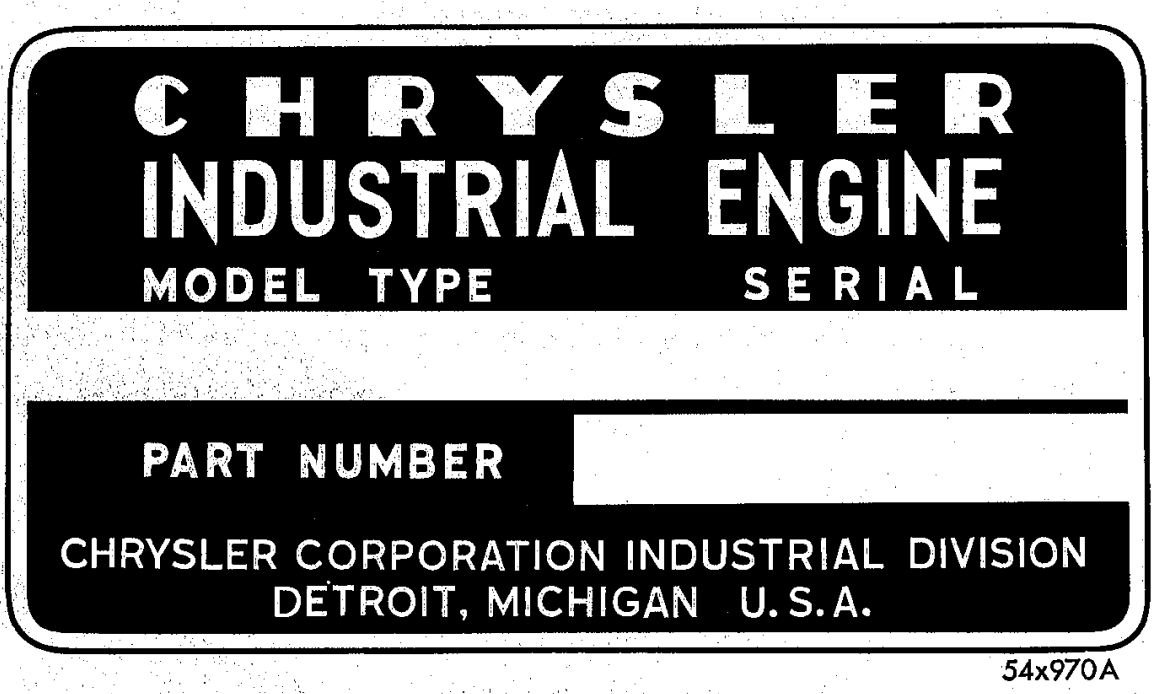
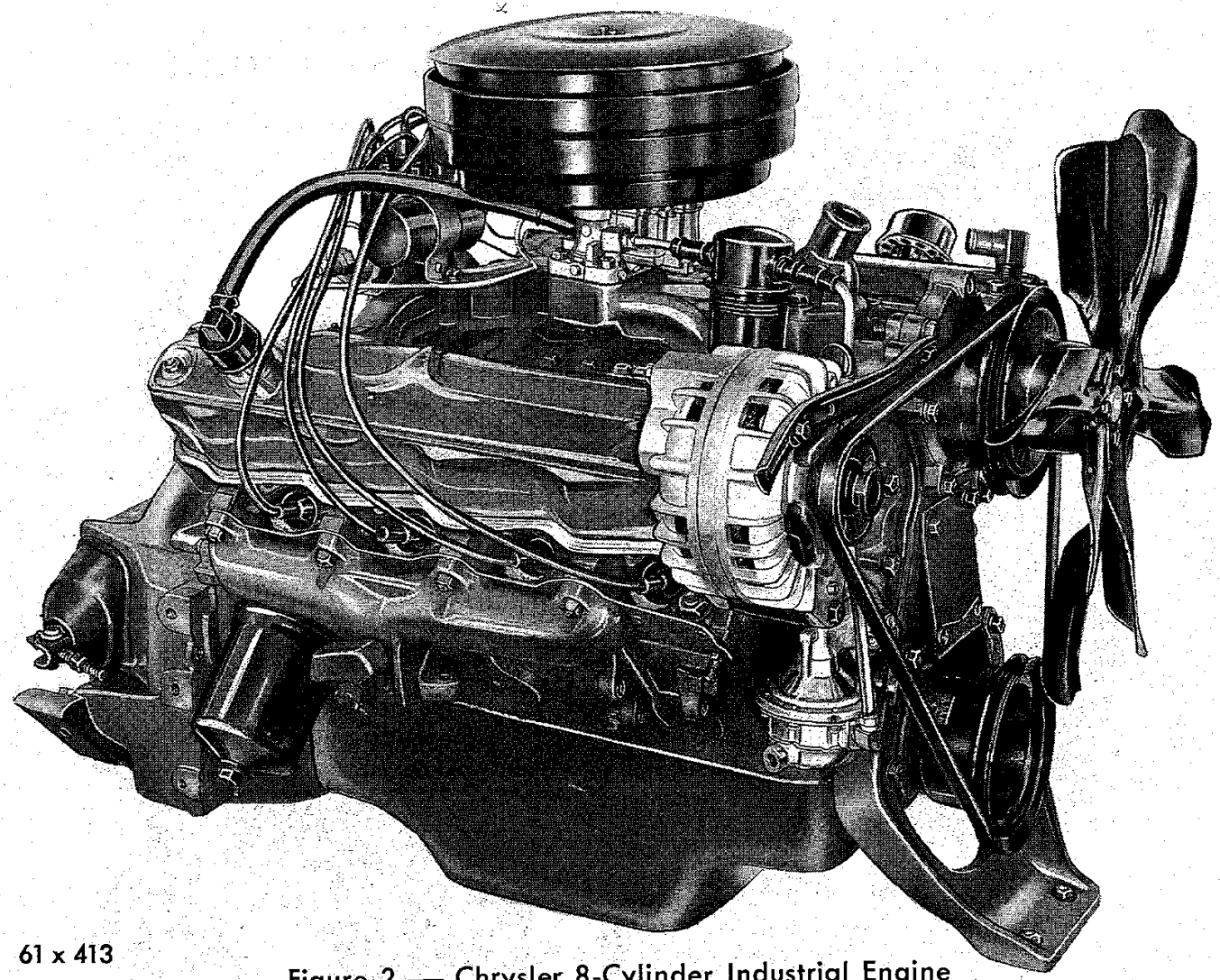


Figure 1 — Engine Identification Name Plate

DESCRIPTION

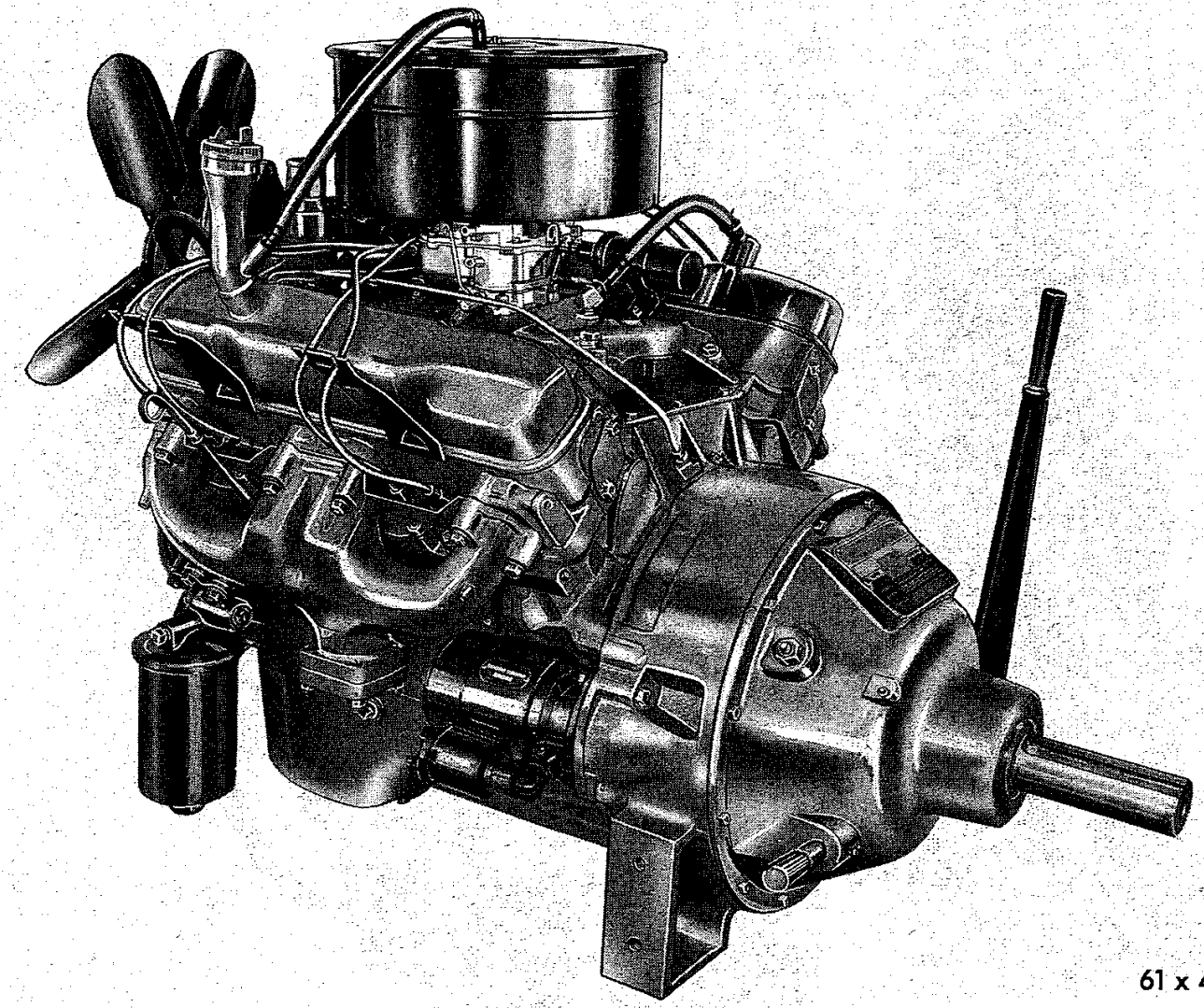
GENERAL DIFFERENCES AMONG MODELS

Chrysler 8-cylinder Industrial Engines, Models H-318, HB-318, HC-318, H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413 and HT-413, (Figures 2, 3 and 4) are supplied in various types for powering: Delivery trucks, Sweepers, Lift trucks, Navigation and Stand-By Pumps, Wind Machines, Mobile Air Conditioners, Crane Carriers, Hoisting Equipment, Welding Generators, Tow Tractors, Concrete Mixers, Orchard Sprayers and many other industrial applications.



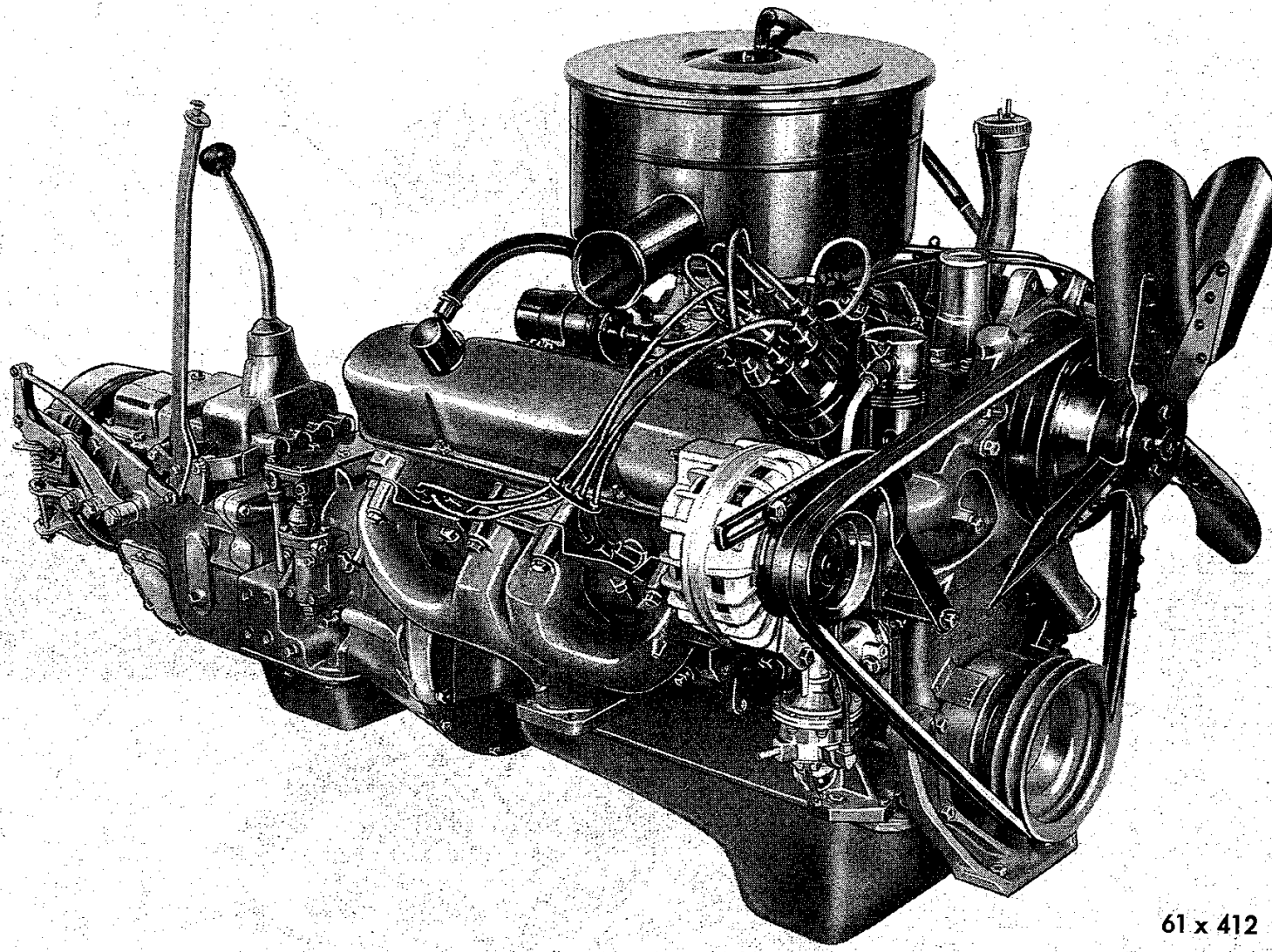
61 x 413

Figure 2 — Chrysler 8-Cylinder Industrial Engine with Clutch Housing (Model H-318)



61 x 414

Figure 3 — Chrysler 8-Cylinder Industrial Engine Model H-361



61 x 412

Figure 4 — Chrysler Industrial Engine Model HT-361, HT-413
with Power Torque and 5-Speed Transmission

In order to identify the service parts requirements or where various accessories are required for different adaptions, such as the New Power Torque units; 3, 4 or 5-speed Transmissions, Power Take-off or Liquid Propane Gas Operation, a separate model and type number is designated for each engine, such as Model, H-318-101, H-361-103, HT-361-104, H-413-106, HT-413-107. This is done so that your engine can be identified in determining the service parts requirements or where additional accessories are required.

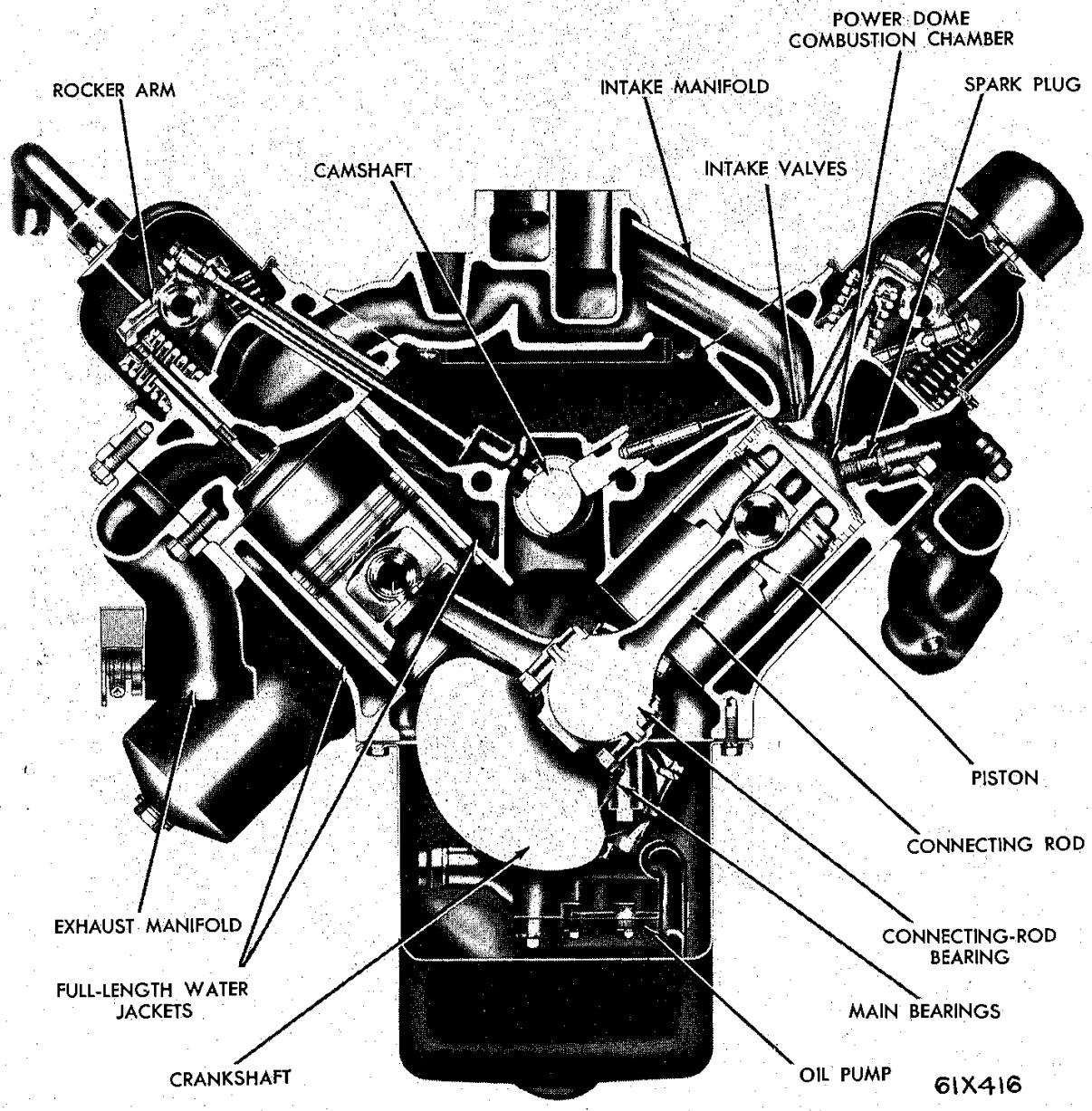


Figure 5 — Chrysler 8-Cylinder Industrial Engine
Models H-318, HB-318, HC-318 (Sectional View)

CONSTRUCTION

The new Chrysler Industrial Engines, as shown in Figures 5, 6 and 7 are V-type eight cylinder, four stroke cycle, internal combustion gasoline engines with valve-in-head poppet valves. The engines are pressure lubricated and liquid cooled. "H" indicates light duty operation. "HB"

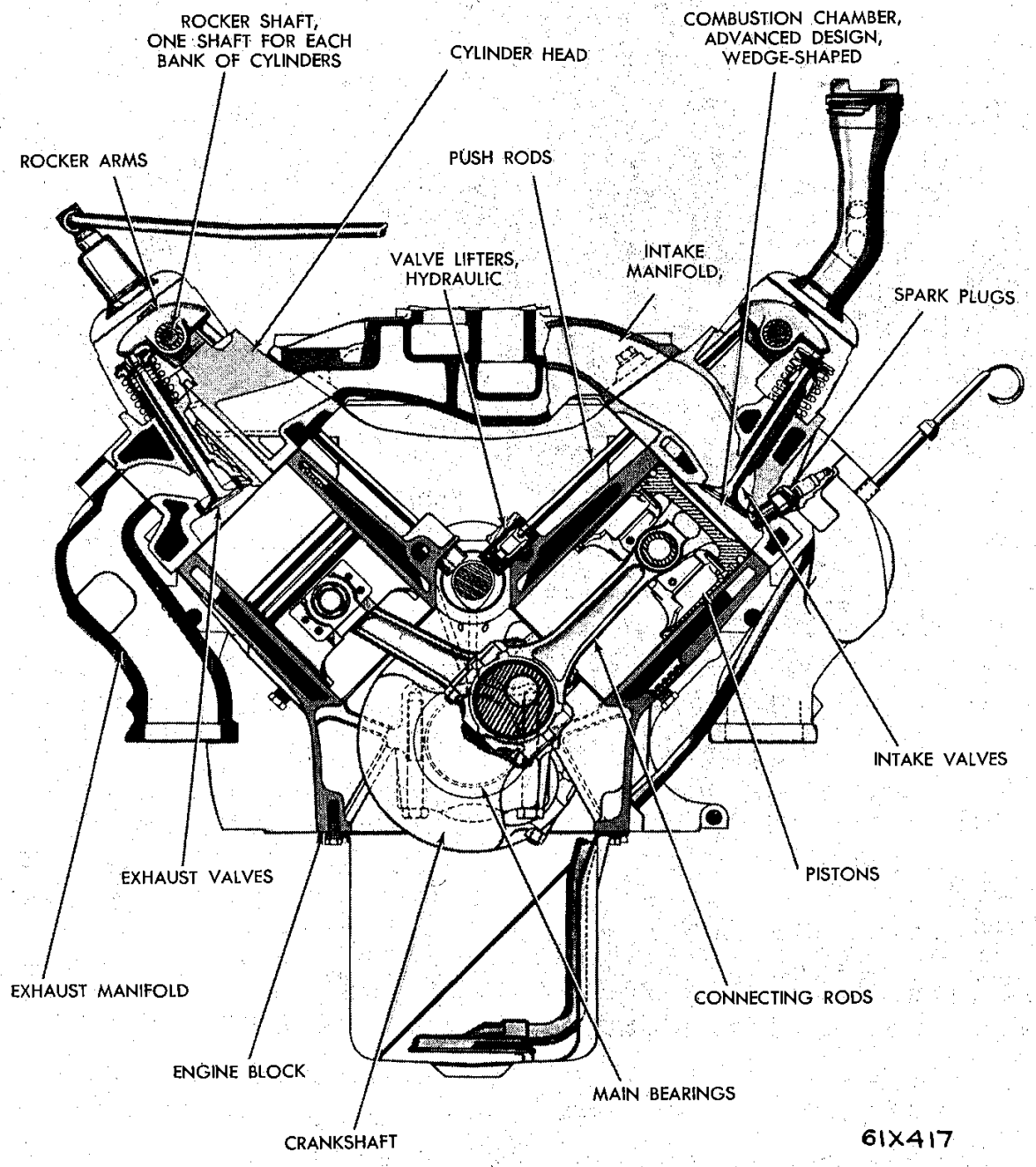


Figure 6 — Chrysler 8-Cylinder Industrial Engine Models HT-361, HT-413 (Sectional View)

1. Air Cleaner
2. Coil
3. Tube
4. Bracket
5. Tube
6. Gasket
7. Reinforcement
8. Bracket
9. Air Cleaner
10. Cover
11. Gasket
12. Shield
13. Head
14. Indicator
15. Manifold
16. Tube
17. Gasket
18. Clamp
19. Gasket
20. Gasket
21. Elbow
22. Gasket
23. Thermostat
24. Fitting
25. Housing
26. Gasket
27. Pump Package
28. Hub
29. Pulley
30. Screw
31. Washer
32. Pulley
33. Damper
34. Oil Filter
35. Pump
36. Cover
37. Gasket
38. Gasket
39. Pan
40. Oil Seal
41. Block (Serviced in short engine 9-01-24)
42. Strainer
43. Pump Package
44. Gasket
45. Manifold
46. Starter
47. Solenoid
48. Support
49. Cover
50. Gear
51. Torque Converter
52. Housing
53. Shield
54. Spark Plug
55. Shield
56. Head
57. Pipe
58. Gasket
59. Cover
60. Bracket
61. Bracket
62. Alternator
63. Retainer
64. Distributor
65. Cable Set
66. Reinforcement
67. Strap
68. Manifold
69. Bracket
70. Choke
71. Gasket
72. Carburetor
73. Gasket

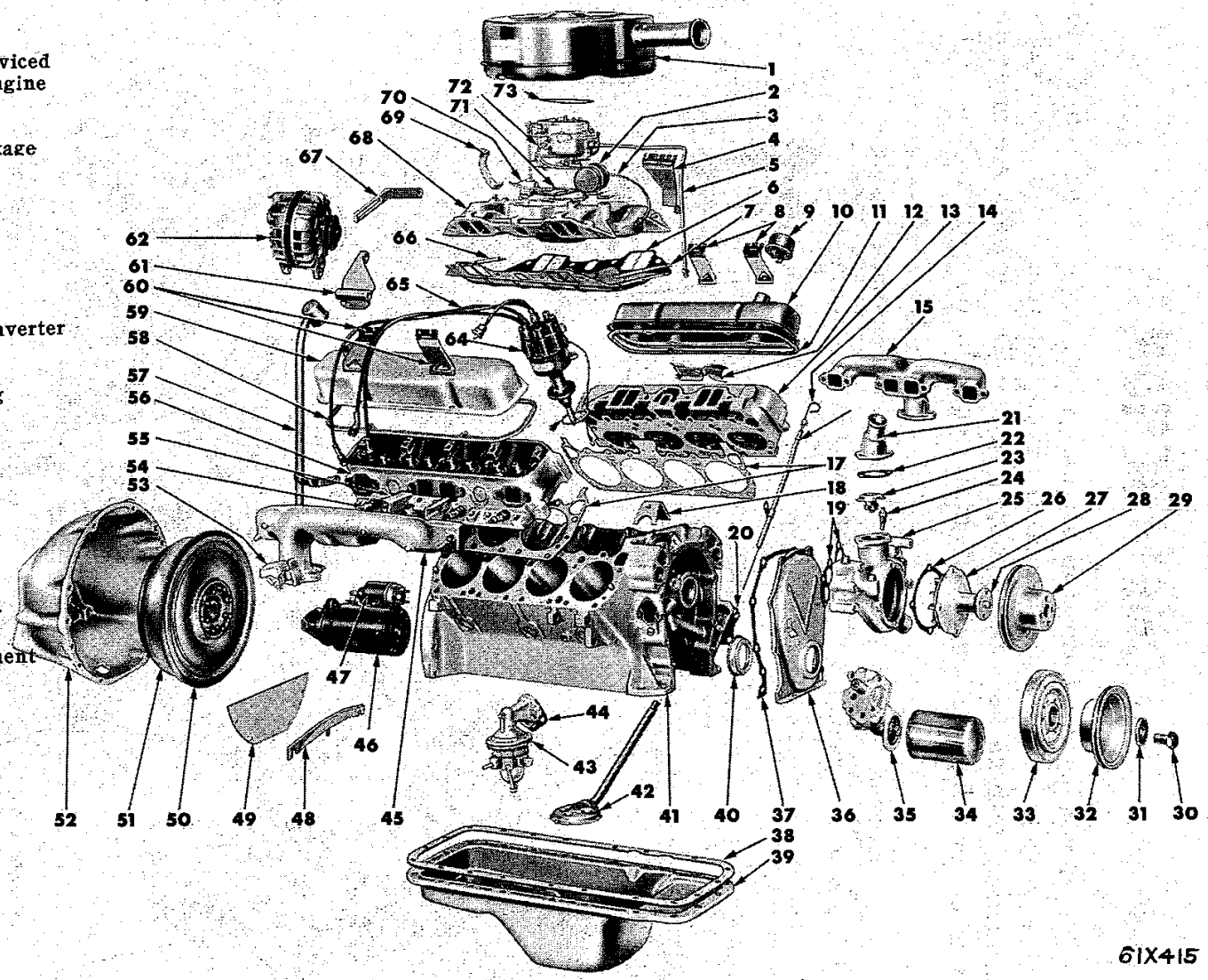


Figure 7 — Chrysler 8-Cylinder Industrial Engine
Models H-361, H-413 (External View)

indicates medium duty operation. "HC" indicates high compression medium duty operation. "HT" indicates heavy duty operation. The numbers designate the cubic inch displacement of the engine.

The cast iron engine block which supports the pistons, tappets and crankshaft is short, low and rugged. Full length water jackets surround the equally-spaced cylinders. The "over-square" bore and stroke design contribute to the longevity and operating economy of the engine.

The camshaft is driven by a silent timing chain on Models H-318, HC-318, H-361, HB-361, HC-361, H-413, HB-413, HC-413, HC1-413; and by a roller chain on Model HB-318; and by gears on Models HT-361, and HT-413. The camshaft provides adequate valve overlap for deep breathing past the silchrome intake valves. Model HB-318 has stellite faced exhaust valves. On Models HT-361 and HT-413 the exhaust valves are stellite faced sodium filled. On Models HB-361, HC-361, HB-413 and HC-413 the exhaust valves are stellite faced with solid stems. Models HB-361, HC-361, HT-361, HB-413, HC-413 and HT-413 have replaceable exhaust valve seats.

The valves are operated by rocker arms on single rocker shafts on each cylinder head. All HT model engines are equipped with positive exhaust valve rotators .

Removable valve stem guides are used on HT-361 and HT-413 models.

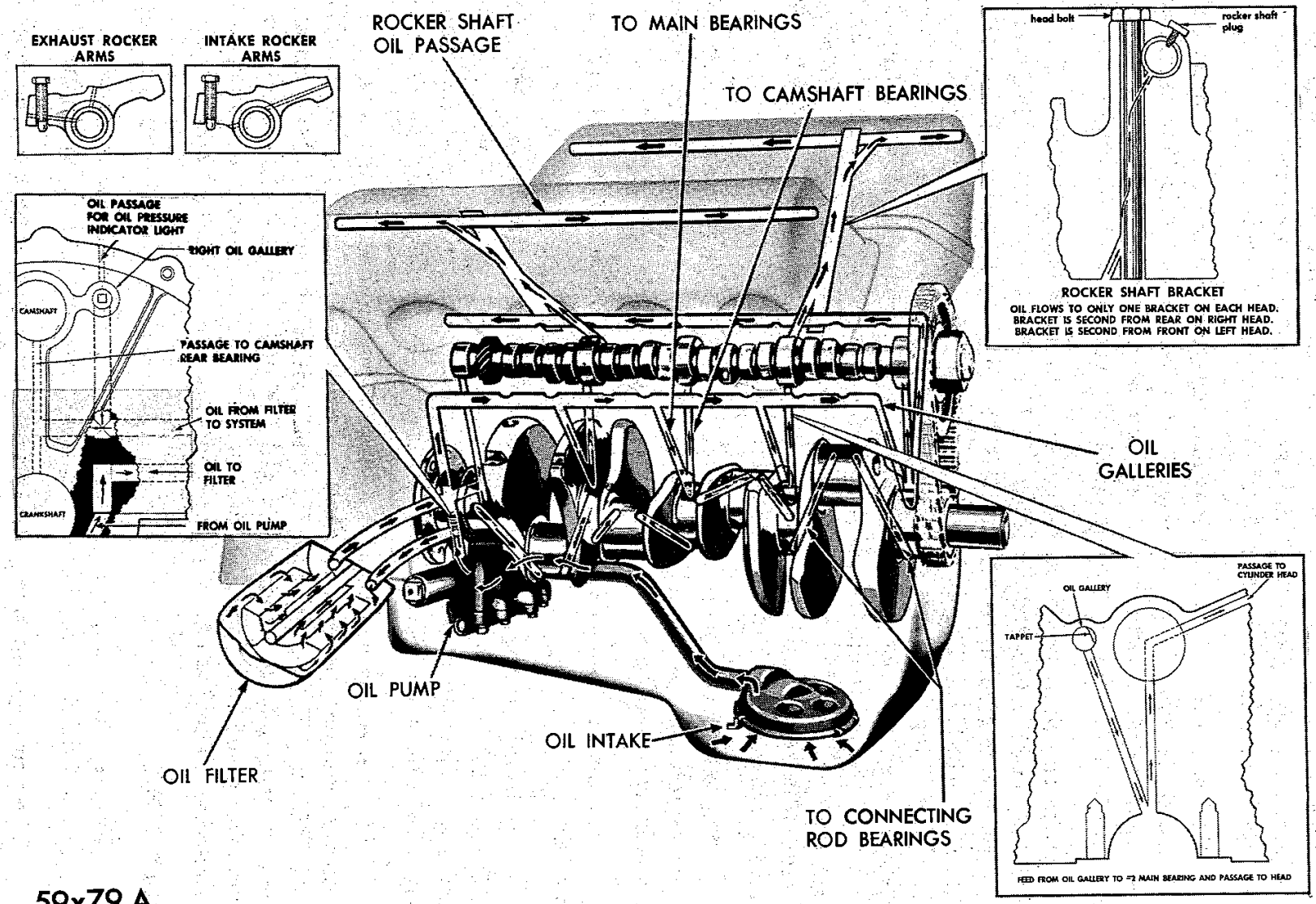
Hydraulic tappets are used on Models HB-318, H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413, HT-413, and require no adjustment. Mechanical tappets are used on Models H-318 and HC-318. The valve clearance adjustments are made at the rocker arms.

All connecting rod bearings and the five main bearings have precision removable type bearing shells. Models H-318, HC-318, H-361, HB-361, HC-361, H-413, HC-413, HC1-413 use steel backed babbit rod and main bearing inserts. Models HB-318, HT-361, and HT-413 use tri-metal connecting rod and main bearing inserts with a hardened shot peened crankshaft. The five camshaft bearings are also of the removable type.

LUBRICANTS

Engine lubricating oils perform many various functions, under very trying conditions in the modern high performance industrial engine.

The primary function of the oil is to lubricate all parts of the engine to reduce friction. Many different types of friction are involved. The pistons moving up and down within the cylinders have a sliding friction.



59x79 A

Figure 8 — Engine Oiling System Models H-318, HB-318, HC-318

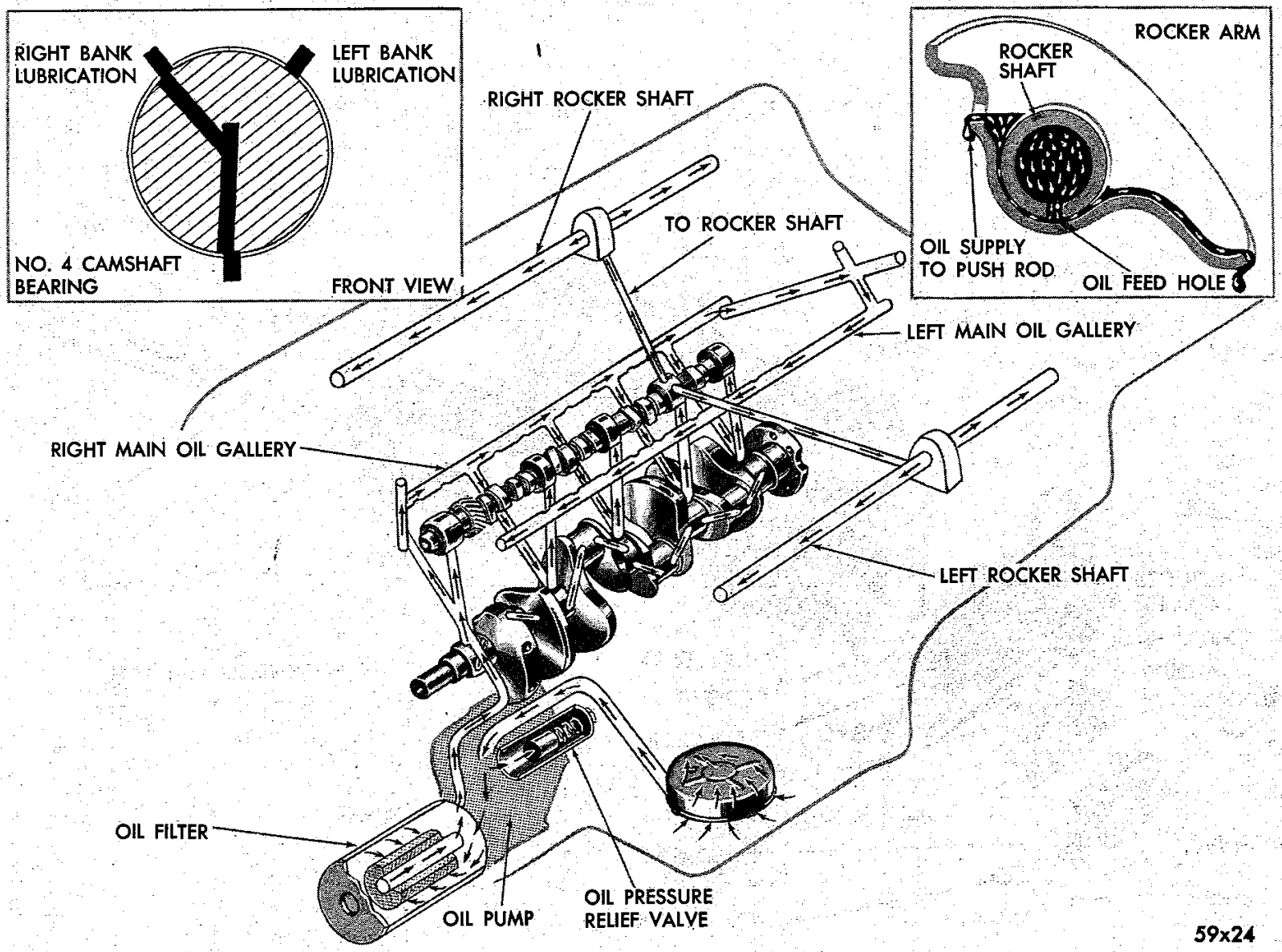


Figure 9 — Engine Oiling System Models H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413, and HT-413

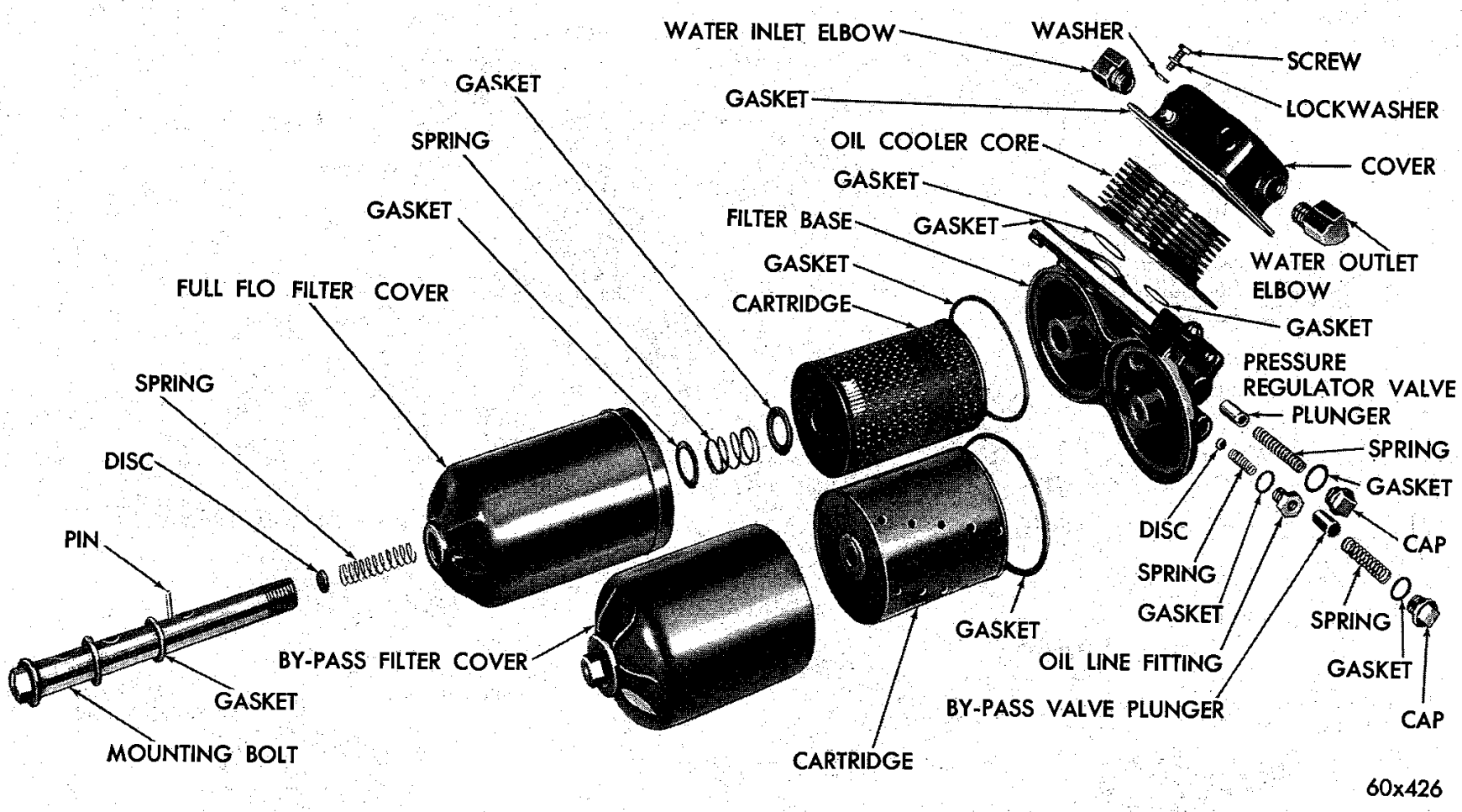


Figure 10 — Dual Filter and Oil Cooler Assembly

The piston pins and connecting rod bearings must withstand a direct contact type of friction. There is also a rolling type friction, between gears and between roller bearings. The tolerances or clearances between these parts varies. In many places in the engine the oil must separate parts which are less than one thousandth of an inch apart. Yet the oil must have sufficient film strength to withstand continuous pressure and changes in temperature without breaking down or permitting direct contact between the moving parts.

In performing its lubricating function, the engine oil also acts as a coolant to transfer a portion ofthe heat of combustion from the pistons and valves to the cooling system.

The engine oil is also a cleaning agent, picking up small particles of foreign matter, condensation, etc. which can be carried to the oil filter where the material is trapped and held out of circulation.

Engine oil maintains a seal, especially between the piston rings and the cylinder walls. The two top piston rings are called compression rings because their primary function is to hold the compression pressures within the combustion chambers. In acting as a sealer, the engine oil lends assistance to the piston rings.

LUBRICATION

The engine oiling system of the H, HB, HC, and HT-318 engines consists of a rotor type oilpump and full flow oil filter. Oil is forced under pressure by the oil pump to a series of oil passages in the engine as shown in Figure 8.

The standard engine oiling system of the H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413, HT-413 engines consists of an externally mounted rotor type oil pump and a full flow filter. Oil is forced under pressure by the oil pump to a series of oil passages in the engine as shown in Figure 9. Some heavy duty HT-361 and HT-413 engine applications require dual oil filtration, where a full flow and by-pass type filter is employed in conjuction with an oil cooler (Fig. 10).

EXHAUST VALVES

One of the outstanding features of the Chrysler 8-cylinder Industrial Engines is sodium-cooled exhaust valves which are available as standard equipment on Models HT-361 and HT-413 only. They are specified for heavy duty operation (Fig. 11). The sodium-cooled valve stem is made hollow and then partially filled with pure metallic sodium, which liquefies at 207°F. In liquid form, the sodium moves up and down with the mo-

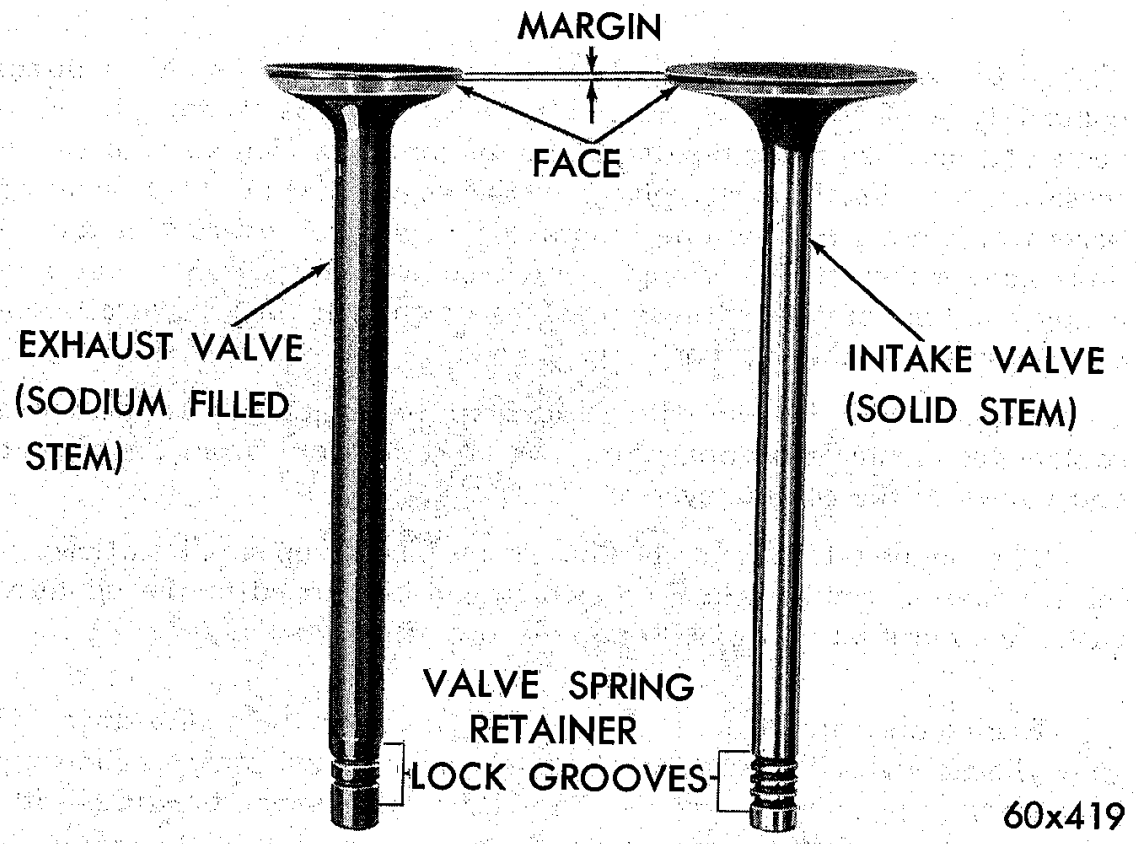


Figure 11 — Intake and Sodium Filled Exhaust Valves

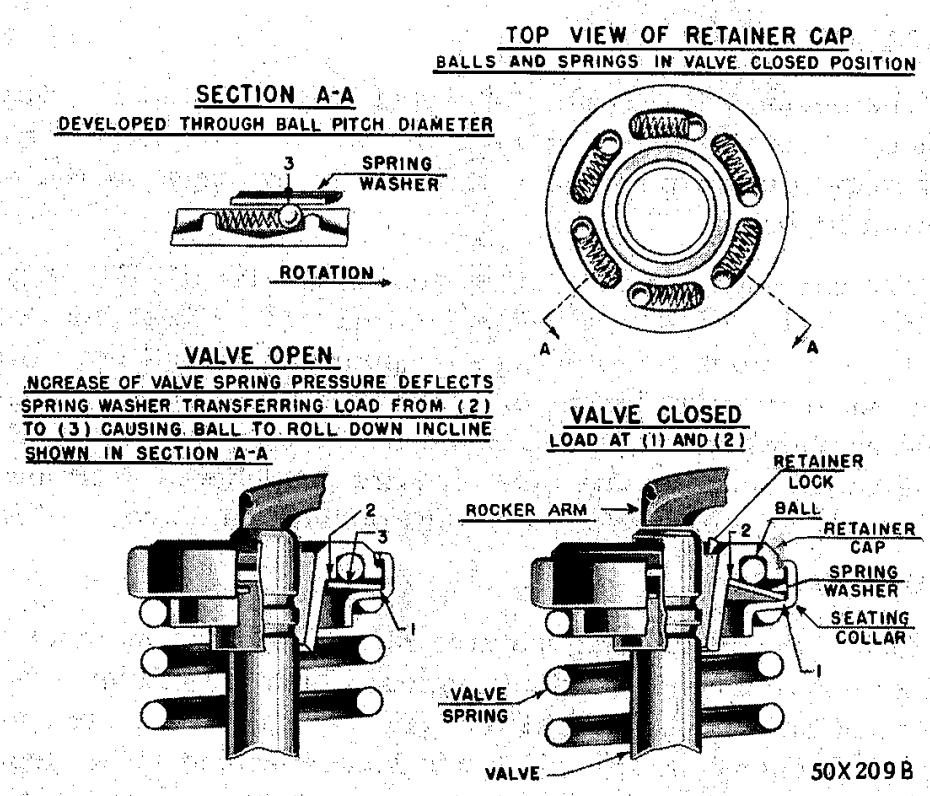


Figure 12 — Exhaust Valve Spring Retainer Assembly Rotators (Schematic View)

tion of the valve in operation and helps to transfer heat from the valve head to the engine cooling system. The engines equipped with sodium-cooled valves can be identified by a decal attached to the cylinder head cover near the engine identification name plate.

EXHAUST VALVE ROTATORS

On all "HT" Models only, Industrial Engines are equipped with exhaust valve rotators to provide positive rotation of the exhaust valves each time they open. Their purpose is to prolong the life of exhaust valves. (Fig. 12).

The rotators are installed on the valve stems in place of the conventional valve spring retainers, changing from four to two bead valve locks.

When rotators are used on the exhaust valves, special valve springs are used, which are not interchangeable with intake valve springs.

ADJUSTING VALVE TAPPETS

The valve tappets on Models H-318 and HC-318 should be adjusted with the engine running at idle at normal operating temperature. The valve tappet screws are of the self locking type, without locknuts. The screw should have a minimum of 3 foot pounds torque as it is being turned, and if less than this, replace the adjustment screw and, if necessary the rocker arm. Adjust the valve tappets to Intake .012 inch; Exhaust .022 inch. It is important that the proper clearance is maintained to insure satisfactory engine performance.

FUEL SYSTEM

The fuel system includes the fuel lines, fuel pump and filter, carburetor, intake manifold and throttle control. Fuel from the tank passes through the filter into the fuel pump, which is driven by an eccentric on the front end of the camshaft. The fuel pump forces fuel into the carburetor where it is atomized and mixed with air and drawn through the manifold and valves into the combustion chamber.

The Stromberg Carburetors (Figs. 13 and 14) Series WW3-190, WW3-194, WW3-185 and AAVP-2 are a dual throat downdraft type with each throat having its own idle system (with adjustable needle), main metering system and throttle valve. The idle system and main metering systems are supplemented by the float system, the accelerating system and the power system. The function of each system is described briefly as follows:

THE FLOAT SYSTEM

The function of the float system is to maintain a constant level of

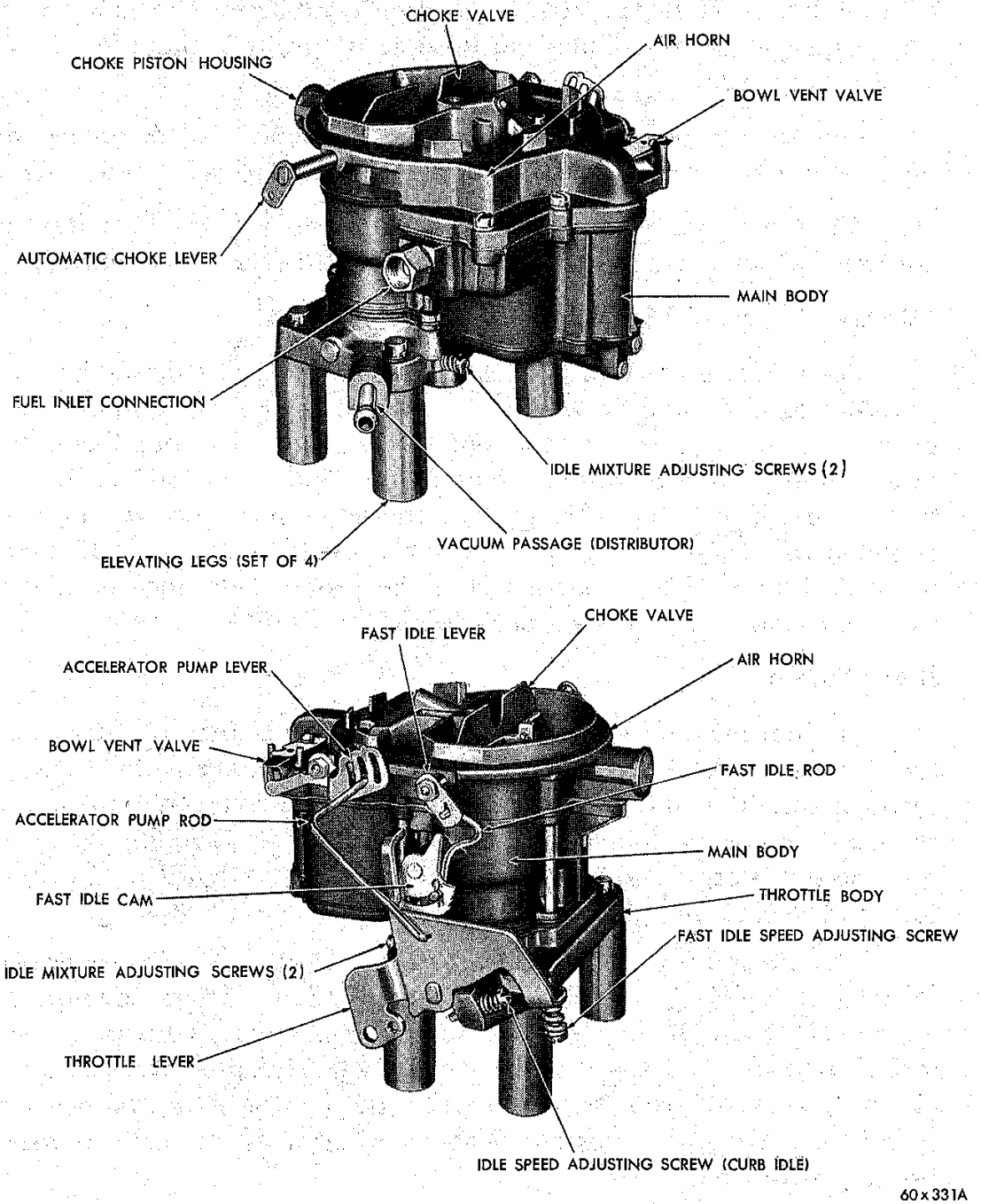


Figure 13 — Stromberg Carburetor Assembly WW3-190, WW3-194

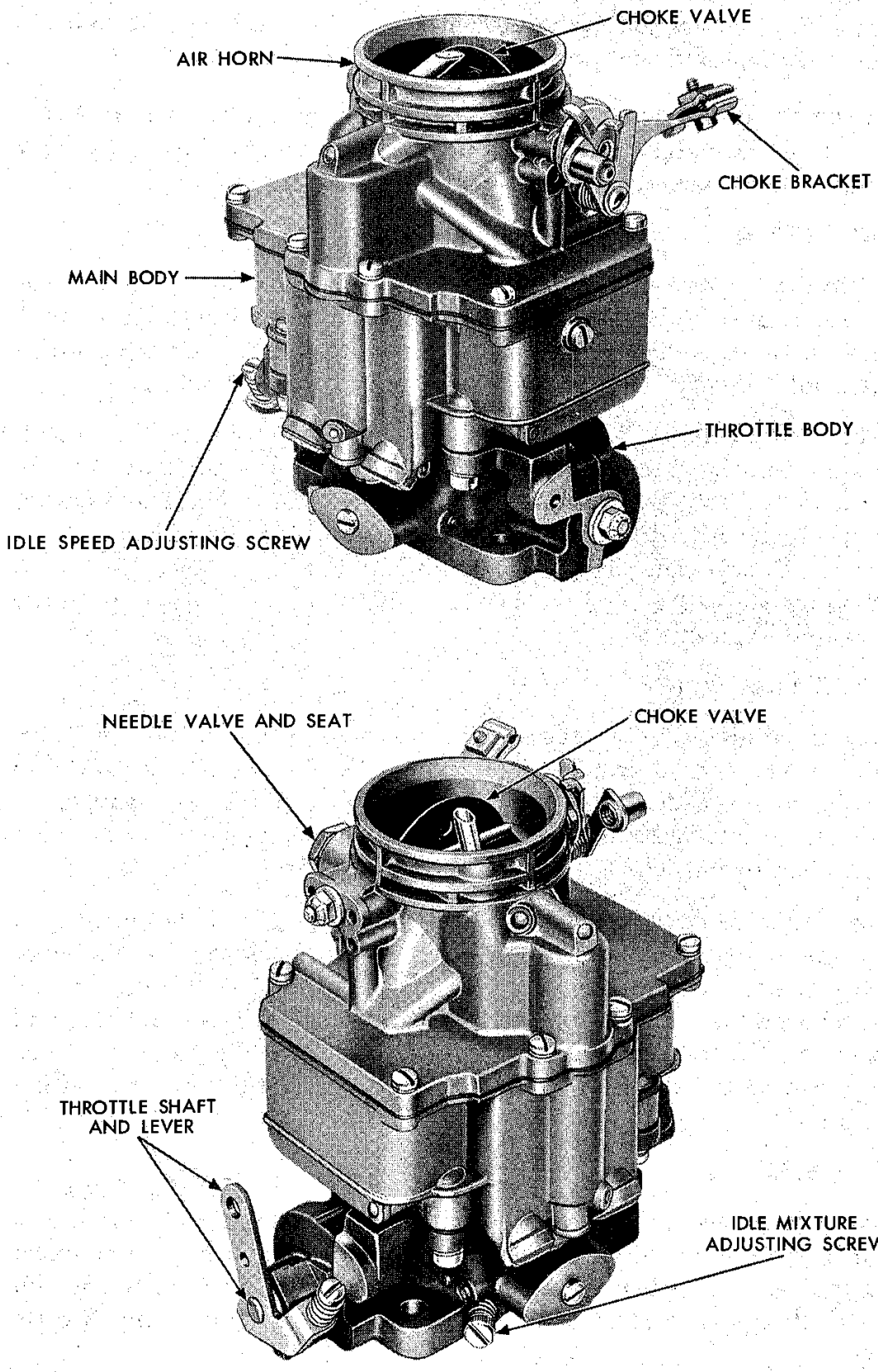


Figure 14 — Stromberg Carburetor AAVP-2

fuel in the float chambers at all times and under all normal conditions of operation. Fuel enters the carburetor at the fuel inlet, flows through the float needle valve and seat and into the float chambers.

When the fuel reaches a given level, the floats shut off the fuel supply at the needle valve. The float chambers are vented internally by a vent tube which connects the float chambers with the air horn.

THE IDLE SYSTEM

With the throttle valves closed, and the engine running at slow idle speed, fuel from the float chambers is metered into the idle tubes through an orifice at the base of each idle tube. The air taken in through the idle air bleed holes mixes with the fuel at the top of the idle tubes.

The mixture of air and fuel flows down the channels where it is mixed with additional air entering through the secondary idle air bleeds. The mixture is discharged at the lower idle discharge holes. The quantity of fuel discharged is controlled by adjustable idle needle valves. As the throttle valves are opened slightly, the air-fuel mixture is also discharged from the upper idle discharge holes to supply the additional fuel required for increased engine speed.

MAIN METERING SYSTEM

The main metering system controls the flow of fuel during the intermediate or part throttle range of operation. With the throttle valves in a partially open position, fuel flows from the float chambers through the main metering jets and enters the main discharge jets where it is mixed with air taken in through the high speed air bleeders.

This mixture of air and fuel is then discharged into the air stream through the auxiliary venturi tubes. The main body and main discharge jets are so designed that should vapor bubbles form in the fuel in the main discharge system, due to high temperatures, the vapor bubbles will collect in the outside channels surrounding the main discharge jets, rise and vaporize in the domes of the high speed bleeders, thus preventing "percolation".

POWER SYSTEM

The power system is incorporated into the carburetor to provide a richer mixture for maximum power and high speed operation. The extra fuel for power is supplied by a vacuum controlled power piston which automatically operates the power by-pass jet in accordance with throttle opening.

Intake manifold vacuum is maintained above the vacuum piston through a vacuum channel which leads to the manifold flange of the

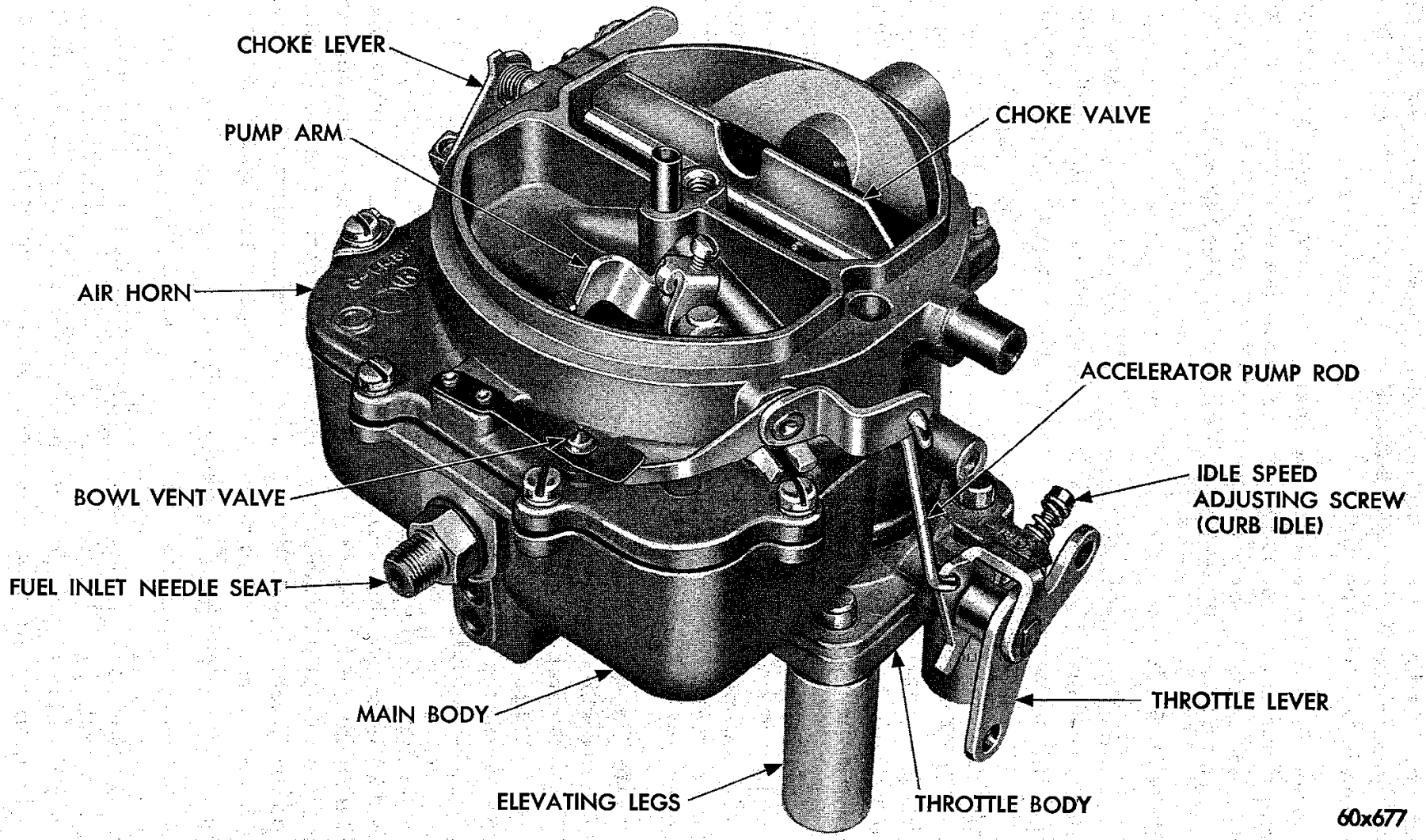


Figure 15 — Ball and Ball Carburetor Assembly BBD-2905 SA

carburetor. During partial throttle operation, the vacuum above the vacuum piston is sufficient to overrule the compression spring and hold the piston in the "UP" position.

When the throttle valves are opened to the point where the manifold vacuum drops to approximately four to five inches of mercury, the compression spring then moves the piston "DOWN" to open the power bypass jet and meter additional fuel into the main metering system.

ACCELERATING SYSTEM

To insure a smooth uninterrupted flow of power for acceleration, additional fuel must be metered into the engine. This is accomplished through the use of an accelerating pump which is operated by vacuum.

As the throttle valves are opened, the accelerating pump piston is moved "DOWN" either by a pump lever or by a drop in vacuum above the piston to close the inlet ball check valve and force a metered quantity of extra fuel through the outlet ball check valve and pump discharge nozzle into the air stream.

With the return of the accelerating pump lever to the released position or the return to normal engine vacuum, the outlet ball check valve "CLOSES" while the inlet ball check valve "REOPENS", thus permitting fuel from the float chamber to enter and refill the accelerating pump cylinder.

NOTE: The AAVP-2 carburetor is supplied by the carburetor manufacturer with a hollow screw in the mouth of the vacuum channel. When the carburetor is used with a governor this crew must be in the passage to block off the connection between the throat and the vacuum passage. When not used with a governor this screw must be removed.

The BBD Series Ball and Ball Carburetor, BBD-2905SA and BBD-2923SA are of the dual throat downdraft type and incorporates a manual choke. (Fig. 15). Each throat has its own throttle valve, idle and main metering systems which are supplemented by the float, accelerating and power system. The carburetor is used in conjunction with a mechanical governor. The operation of the float, low speed, high speed and accelerator pump systems are described briefly:

FLOAT SYSTEM

The float system maintains a fuel supply at the proper level for normal operating conditions. The fuel level is kept at a minimum to limit fuel vaporization and to aid in warm engine starting. It is important that floats be properly adjusted, and needle valve assembly is in good condi-

tion. Equally important is a good seal between the air horn and main body. A poor gasket at this point causes leakage resulting in wasting the fuel and might allow the entrance of dirt or other foreign material, which would result in poor performance.

LOW SPEED SYSTEM

During engine idle or part throttle operation, fuel is supplied to the engine through the low speed system. Fuel enters the main metering jet and is metered through the idle orifice tube where it mixes with air drawn through the idle air bleed. The idle restriction breaks up the fuel as it mixes with air drawn through the idle air bleed. This provides an air-fuel mixture at the idle port and idle adjustment screw port.

It is important that the idle air bleed, idle orifice tube, idle restriction, idle passage, idle port, and idle adjustment screw port are kept clean. Any clogging will result in poor low speed operation. Air leakage through the gaskets will also cause poor engine idling or low speed operation.

HIGH SPEED SYSTEM

During part or full throttle operation, fuel is supplied to the engine through the high speed system.

When the engine is under a heavy load, suddenly accelerated, or operated at very high engine speeds, the step-up system supplies additional fuel through the diffuser bar discharge ports. Fuel flow through the fuel passage of the main metering jet is controlled by the movement of the step-up rod which in turn is moved by a spring and a vacuum-controlled piston. A vacuum passage to the intake manifold is provided for by a drilled passage in the carburetor body and throttle body, and a slotted flange gasket.

Under normal operating conditions, manifold vacuum exerts a strong pull on the vacuum piston. This holds the piston down keeping the step up rod in the orifice of the mainmetering jet. Fuel then flows around the rod, through the jet, and through the diffuser bar discharge ports.

When manifold vacuum falls off, due to a heavy load, sudden acceleration or very high engine speed, the spring moves the piston up, moving the step up rod out of the main metering jet orifice. Additional fuel is then supplied to the engine.

Air is drawn through the high speed air bleed and mixes with the fuel surrounding the main vent tube. The mixture is then drawn from the diffuser discharge ports. It is important that the vent tube is clean. A clogged tube may cause excessively rich mixtures. Leakage of air at the gaskets will decrease or destroy the vacuum and the step-up piston will remain up resulting in excessive fuel consumption.

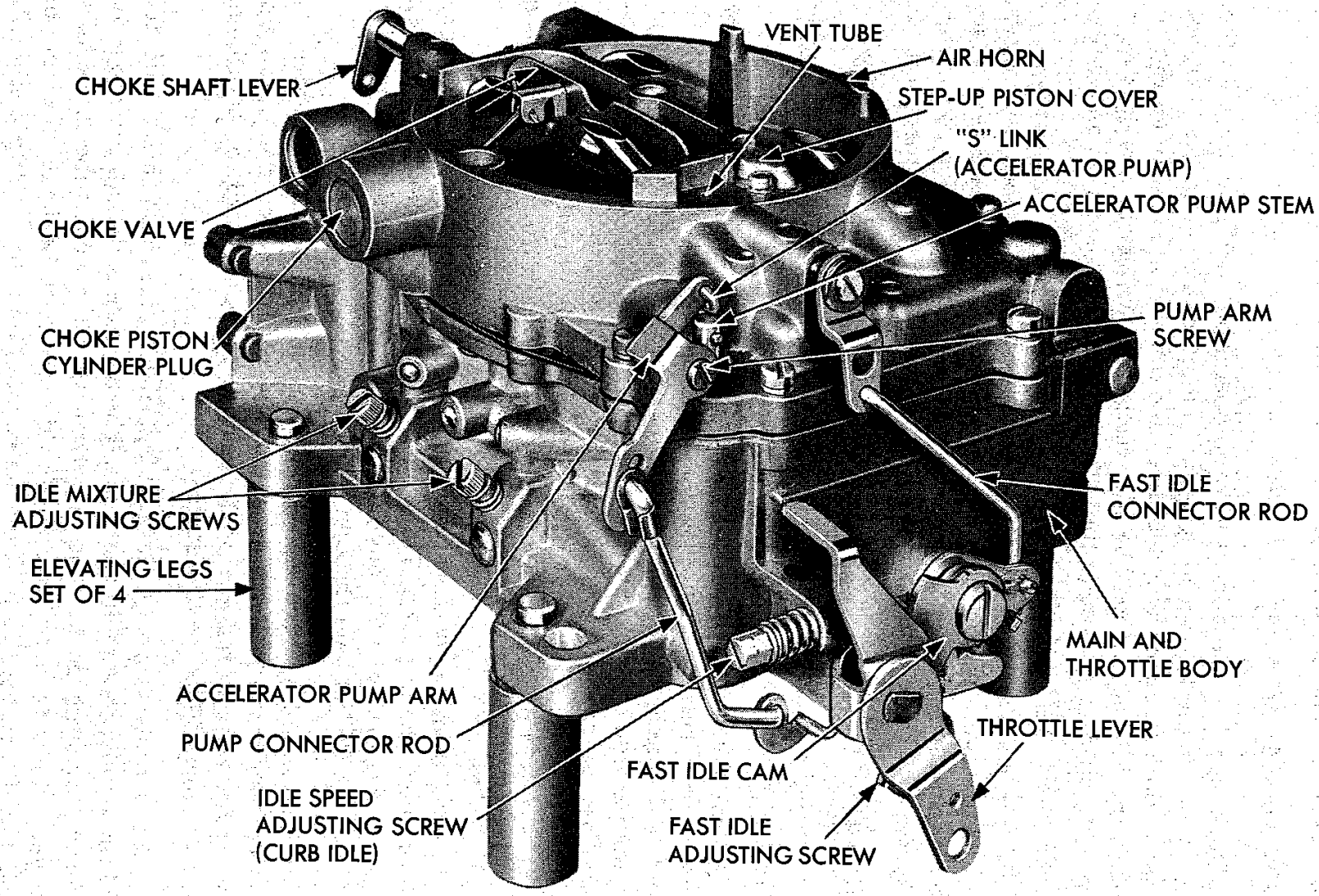


Figure 16 — Carter Carburetor Assembly AFB-3134S

ACCELERATOR PUMP SYSTEM

The accelerator pump system momentarily supplies an extra charge of fuel to the engine when the throttle is opened. The amount of fuel added is proportional to the amount the pedal is depressed. When the accelerator pedal is depressed, the pump plunger spring forces the plunger down and the fuel is discharged past the discharge check ball through the jet and into the air stream. The inlet passage is closed by the inlet check ball as this occurs.

When the accelerator pedal returns, the pump plunger is pulled up drawing a new charge of fuel past the inlet check ball. The discharge check ball is closed, preventing air bleeding into the passage when the pump plunger is pulled up.

When the engine is operated at high speeds, a vacuum exists at the accelerator pump jet. To prevent fuel being drawn out of the pump system, the pump jet air bleed is vented through a passage in the air horn to the float bowl.

A vent is also provided in the plunger to relieve vapor pressure developed by heat in the pump system.

The Carter Model AFB 3134S carburetor is basically two (2) dual carburetors contained in one assembly. (Fig. 16) The section containing the metering rods, accelerating pump and choke is termed the primary side of the carburetor, the other section, the secondary side. It has five (5) conventional systems, as have been used in previous carburetors. They are:

2 — Float System
2 — Low Speed System
2 — High Speed System
1 — Pump System
1 — Integral Automatic Choke System

FLOAT SYSTEMS

The purpose of the float systems is to maintain an adequate supply of fuel at the proper level in the bowls for use by the low-speed, high-speed, pump and choke systems. Primary, and secondary bowls are separated by a partition. The fuel line connection is above the primary needle and seat. Fuel is supplied to the secondary needle and seat through the passage in the air horn.

Setting the floats to specifications assures an adequate supply of fuel in the bowls for all operating conditions. Float adjustments must be made with the tir horn gasket removed and should be checked vertically

(specified distance between air horn and floats) and laterally (sides of floats should just clear the arms of gauge). Correct lateral adjustment is important. If the floats are misaligned, they may bind or drag against the inner walls of the bowl. Adjust by bending the float arms.

Needle valves and seats are carefully matched during manufacture. Do not use the primary needle in the secondary seat or vice versa. To avoid unnecessary bending, both floats should be reinstated in their original positions and then adjusted.

The bowls are vented to the inside of the air horn and also to atmosphere. Bowl vents are calibrated to provide proper air pressure above the fuel at all times. To assure a positive seal, always use a new air horn gasket when reassembling. An air leak at this point can result in a mileage complaint.

A connecting passage along one side of the body effects a balance of the fuel levels and air pressures between the two bowls.

LOW SPEED SYSTEM

Fuel for idle and early part throttle operation is metered through the low speed system.

Gasoline enters the idle wells through the metering rod jets on the primary side of the carburetor and through the main metering jets on the secondary side.

The low speed jets measure the amount of fuel for idle and early part throttle operation. The air by-pass passages, economizers and idle air bleeds are carefully calibrated and serve to break up the liquid fuel and mix it with air as it moves through the passages to the idle ports and idle adjustment screw ports. Turning the idle adjustment screws toward their seats reduces the quantity of fuel mixture supplied by the idle system.

There are no idle adjustment screws on the secondary side of the carburetor.

The idle ports are slot shaped. As the throttle valves are opened more of the idle ports are uncovered allowing a greater quantity of the gasoline and air mixture to enter the carburetor bores.

All by-passes, economizers, idle ports, idle adjustment screw ports, as well as the bore of the carburetor flange must be clean and free of carbon. Obstructions will cause poor low speed engine operation. Worn or damaged idle adjustment screws or low speed jets should be replaced.

HIGH SPEED SYSTEM

Fuel for part throttle and full throttle operation is supplied through the high speed system.

PRIMARY SIDE

The position of the metering rods in the metering rod jets control the amount of fuel flowing in the high speed system of the primary side of the carburetor. The position of the metering rods is controlled mechanically by movement of the throttle and by manifold vacuum applied to the vacuum piston on the vacuumeter link.

SECONDARY SIDE

Fuel for the high-speed system of the secondary side is metered at the main metering jets (no metering rods used).

Throttle valves in the secondary side remain closed until the primary throttle valves have been opened a pre-determined amount. They reach the wide open throttle position at the same time the primary throttle does. This is accomplished by linkage between the throttle levers.

The AFB 3134S carburetor is equipped with a pair of velocity valves, which control the secondary valve operation. The throttle valves of the secondary half of the carburetor are mechanically connected to the primary valves and open with the primary after an approximate 60° lag; and continue to open until both primary and secondary throttle valves reach the wide open position simultaneously. As engine speed increases, the forces exerted by the velocity of intake air down through the venturis of the carburetor increases and tends to overcome the counterweight attached to the velocity valve shaft, permitting the offset velocity valves to position themselves according to engine requirements.

When the engine is cold and the choke is in closed position ,a mechanical latch prevents the velocity valves from opening, so that only the primary side of the carburetor is used during the warm-up period. After the choke is opened fully, the latch is released, and allows operation of the velocity valves according to engine requirements.

ANTI-PERCOLATOR

To prevent the vapor bubbles in the nozzle passages and low-speed wells caused by heat from forcing fuel out of the nozzles, anti-percolator passages, and calibrated plugs or bushings are used. Their purpose is to vent the vapors and relieve the pressure before it is sufficient to push the fuel out of the nozzles and into the intake manifold. Anti-percolator plugs, bushings, and main nozzles are permanently installed and must not be removed in service.

PUMP SYSTEM

The pump system is found only in the primary side of the carburetor.

The accelerating pump system provides a measured amount of fuel, which is necessary to insure smooth engine operation for acceleration.

When the throttle is closed, the pump plunger moves upward in its cylinder and fuel is drawn into pump cylinder, and past the intake checkball. The discharge check needle is seated at this time to prevent air being drawn into the cylinder. When the throttle is opened the pump plunger moves downward forcing fuel out through the discharge passage, past the discharge check needle, and out of the pump jets. When the plunger moves downward the intake checkball is closed preventing fuel from being forced back into the bowl.

If the throttle is opened suddenly, the upper pump spring will be compressed by the plunger shaft telescoping, resulting in a smoother pump discharge of longer duration.

When the throttle valves are opened, a predetermined amount, the pump plunger bottoms in the pump cylinder eliminating pump discharge due to pump plunger movement at high speeds.

During high speed operation a vacuum exists at the pump jets. To

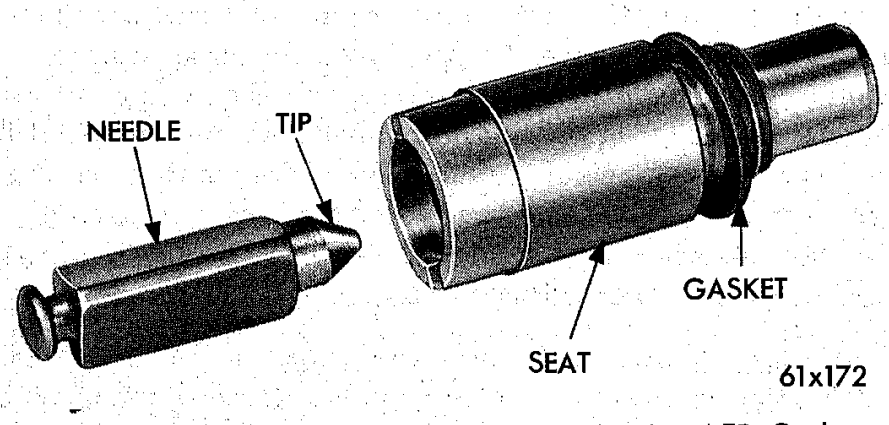


Figure 17 — Rubber Tipped Fuel Inlet Needle for AFB Carburetors

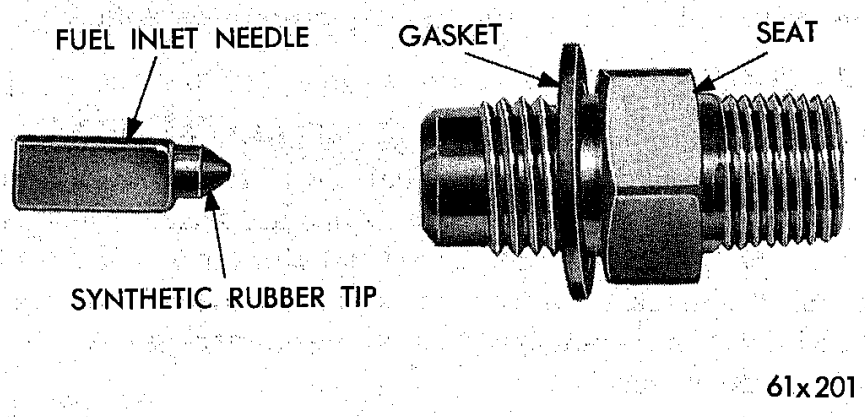


Figure 18 — Synthetic Rubber Tipped Needle, Seat and Gasket Used on Carburetors BBD and WW3

prevent fuel from being drawn through the pump system the passage to the pump jets is vented by a cross passage to the carburetor bowl above the fuel level. This allows air instead of fuel to be drawn off the pump jets.

SYNTHETIC RUBBER-TIPPED FUEL INLET NEEDLE

The BBD Series carburetor, the AFB Series carburetor and the WW3 Series carburetor are equipped with new synthetic rubber-tipped fuel inlet needles (Fig. 17 and 18). The needle tip is a rubber-like material which is not affected by gasoline and is stable over a wide range of temperatures. The tip is flexible enough to make a good seal on the needle seat, and to give increased resistance to flooding.

GOVERNORS

Pierce Governor

Some engines are equipped with a mechanical type, gear-driven governor. Governor weights revolving with the mainshaft through centrifugal force cause the rocker shaft and operating lever to rotate. The operating lever is connected to the carburetor throttle. A calibrated spring attached to the operating lever opposes the effort exerted by the governor weights. The engine speed is governed by the balance of the two forces.

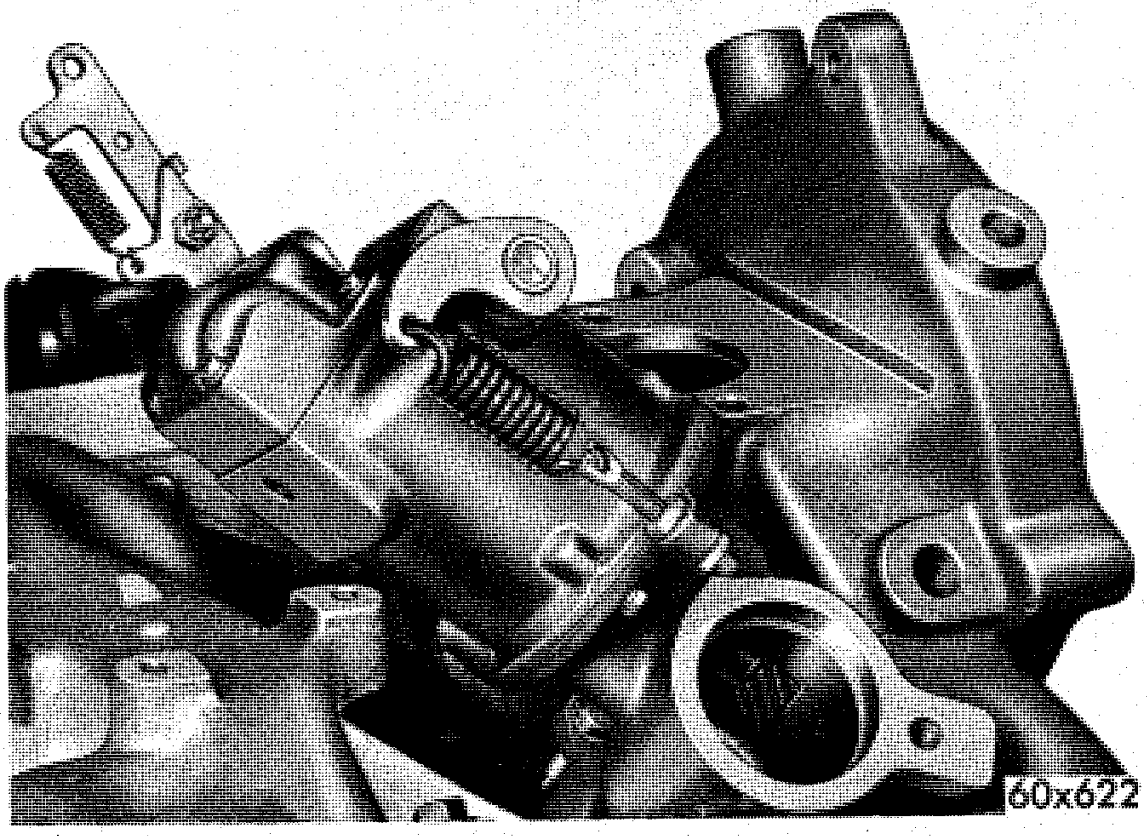


Figure 19 — Pierce Mechanical Gear Driven Governor

Speed and sensitivity are set by the end product manufacturer to provide accurate control. Provision is made for adjustment to vary sharpness of control, and to correct surge. The governor may also be adjusted for governed engine speed. (Fig. 19).

King Seeley Governor

The velocity type King Seeley governor (Fig. 20), used on some engines, is of the sandwich type. Engine speed is governed by the throttle valve which is closed by the velocity of the fuel-air mixture as it passes through the governor. An accurately calibrated spring system attached to the throttle shaft opposes the velocity and controls the position of the throttle valve and the maximum speed of he engine. When in proper operating condition, the governor does not affect engine performance below the speed at which it begins to control, and does not affect fuel consumption.

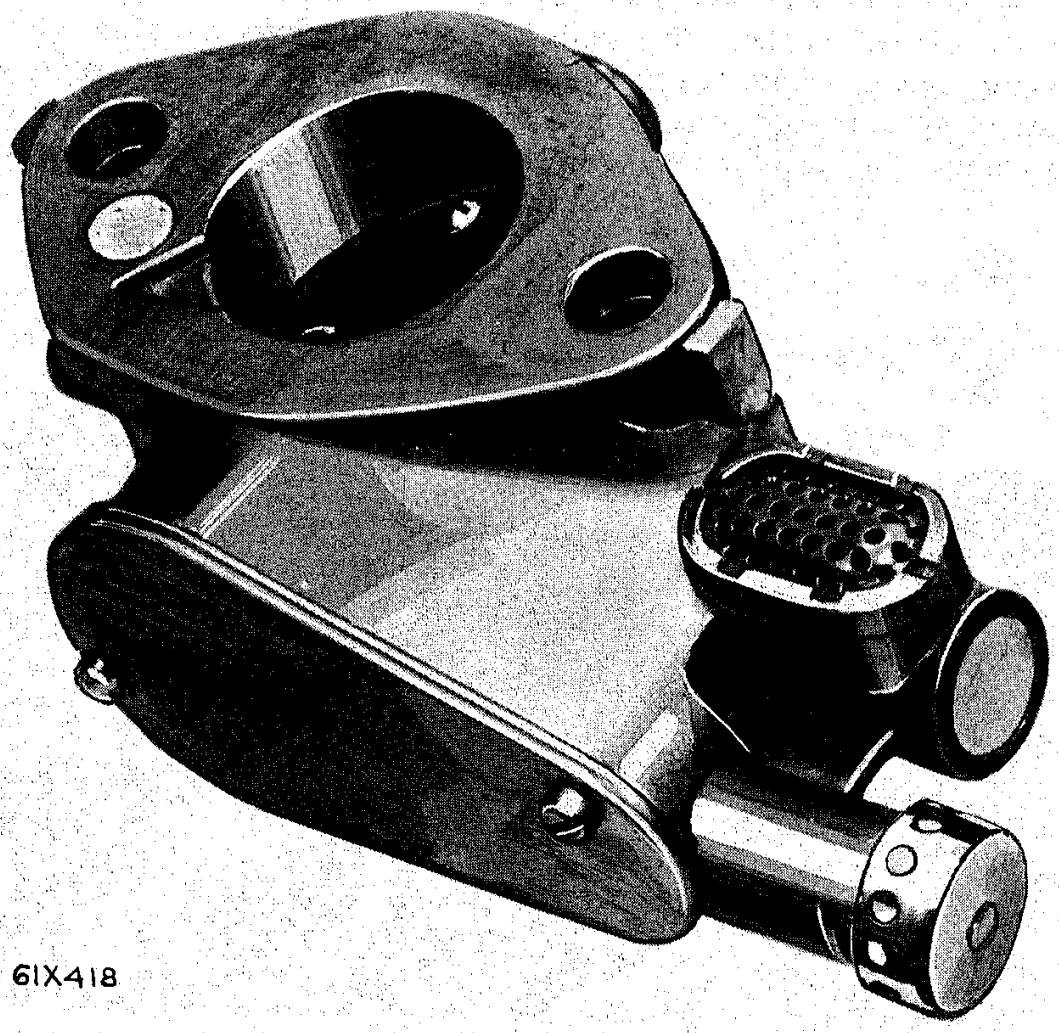
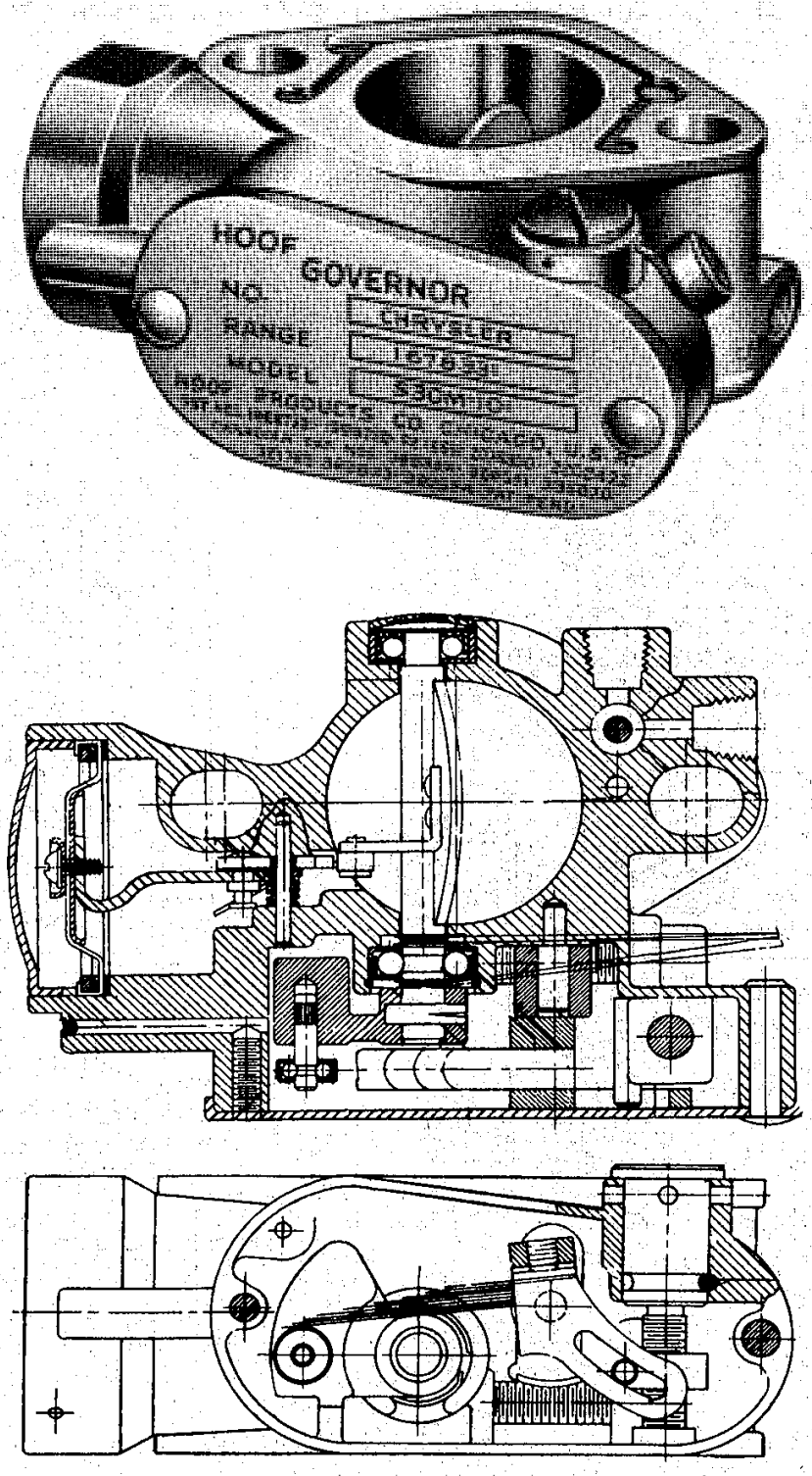


Figure 20 — Velocity Type King Seeley Governor

HOOF VELOCITY GOVERNOR

As the mixture of gasoline and air passes through the governor, it strikes against the governor valve, forcing it toward a closed position, which would close off completely were it not for the opposing action or



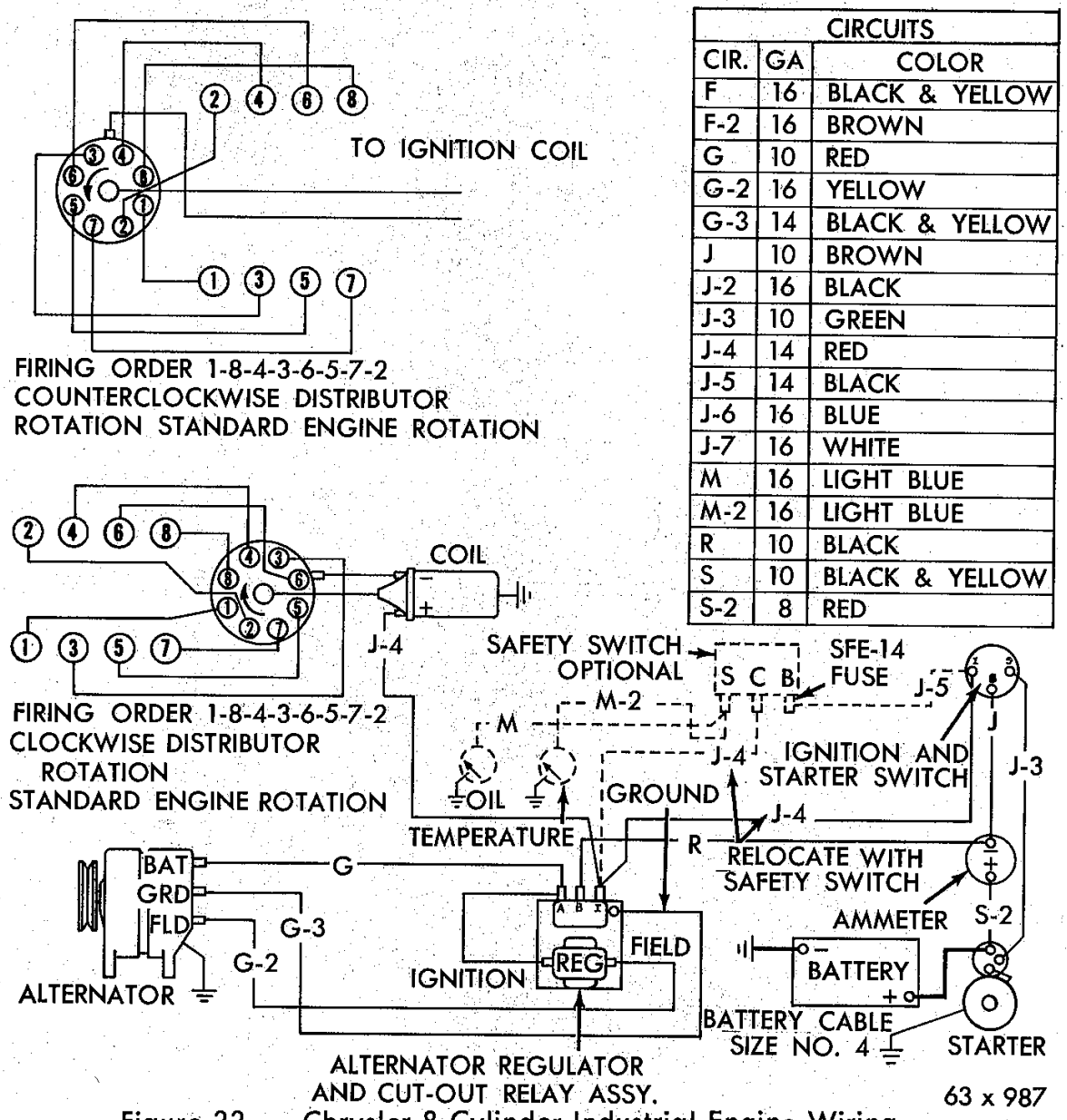
61X210

Figure 21 — Hoof Velocity Governor

force of the governor spring. When the closing action of the valve exactly balances the spring, governing action takes place and maximum speed is fixed at this point. When load is applied — the engine speed tends to drop — the velocity of the gas through the manifold and the pressure against the governor valve is reduced and the spring opens the governor valve to feed more gasoline to the engine to meet increased load demand. Thus, an alsmost constant speed is maintained whether the engine is running with or without load. (Fig. 21)

ELECTRICAL SYSTEM

The electrical system includes an alternator, voltage regulator,



CIRCUITS		
CIR.	GA	COLOR
F	16	BLACK & YELLOW
F-2	16	BROWN
G	10	RED
G-2	16	YELLOW
G-3	14	BLACK & YELLOW
J	10	BROWN
J-2	16	BLACK
J-3	10	GREEN
J-4	14	RED
J-5	14	BLACK
J-6	16	BLUE
J-7	16	WHITE
M	16	LIGHT BLUE
M-2	16	LIGHT BLUE
R	10	BLACK
S	10	BLACK & YELLOW
S-2	8	RED

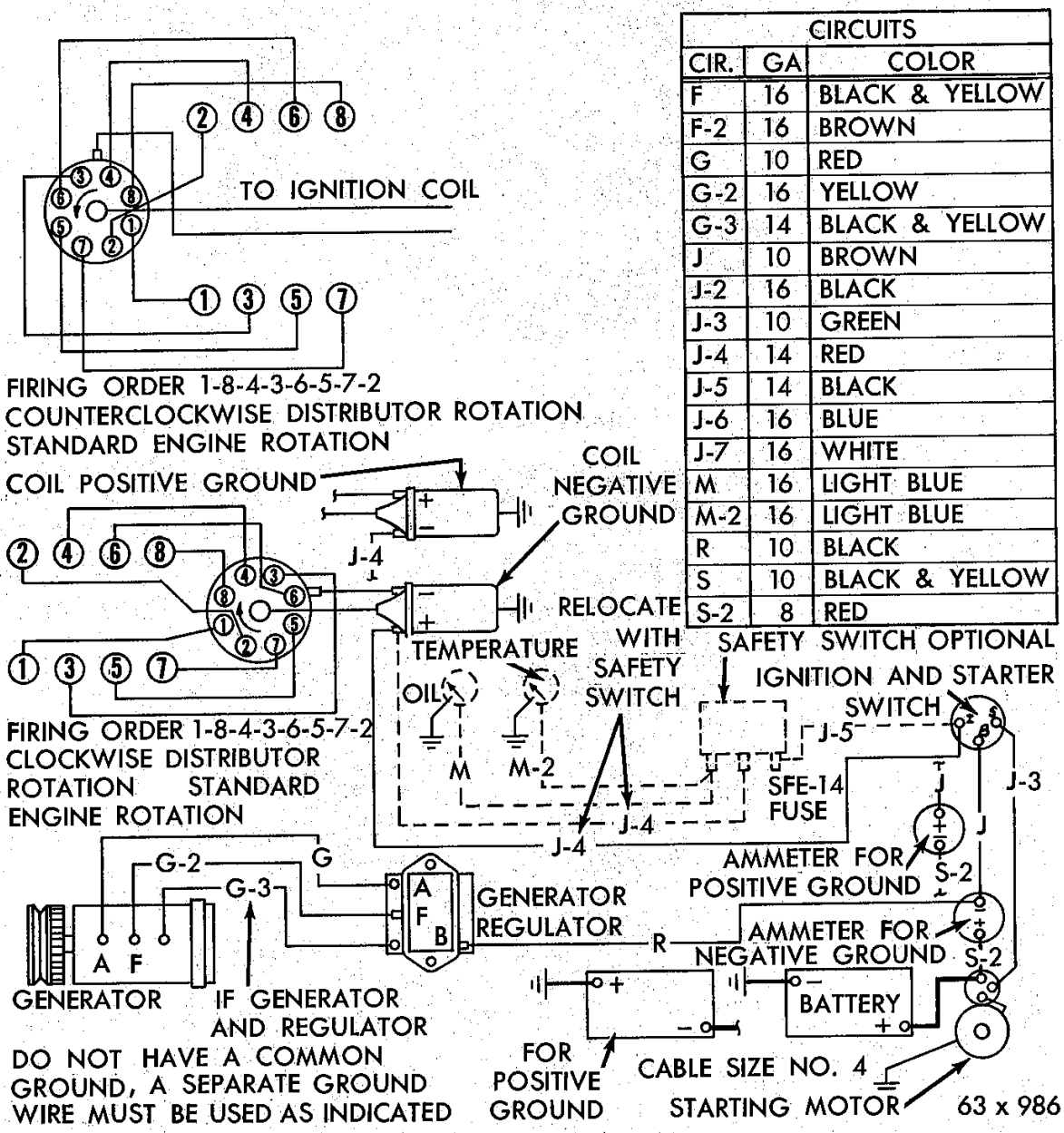
Figure 22 — Chrysler 8-Cylinder Industrial Engine Wiring Diagram (Alternator Equipped) (All Models)

starting motor, starting motor solenoid, ignition distributor, ignition coil, spark plugs together with the necessary cables, connecting wires, ammeter and switches (Fig. 22 and 23).

Alternator

The alternator (Fig. 24) is fundamentally an alternating current generator with six built-in silicon rectifiers that convert the alternating current into direct current, which is available at the output "BAT" terminal.

A regulator (Fig. 25) limits the direct current voltage output. The



CIRCUITS		
CIR.	GA	COLOR
F	16	BLACK & YELLOW
F-2	16	BROWN
G	10	RED
G-2	16	YELLOW
G-3	14	BLACK & YELLOW
J	10	BROWN
J-2	16	BLACK
J-3	10	GREEN
J-4	14	RED
J-5	14	BLACK
J-6	16	BLUE
J-7	16	WHITE
M	16	LIGHT BLUE
M-2	16	LIGHT BLUE
R	10	BLACK
S	10	BLACK & YELLOW
S-2	8	RED

Figure 23 — Chrysler 8-Cylinder Industrial Engine Wiring Diagram (Generator Equipped) (All Models)

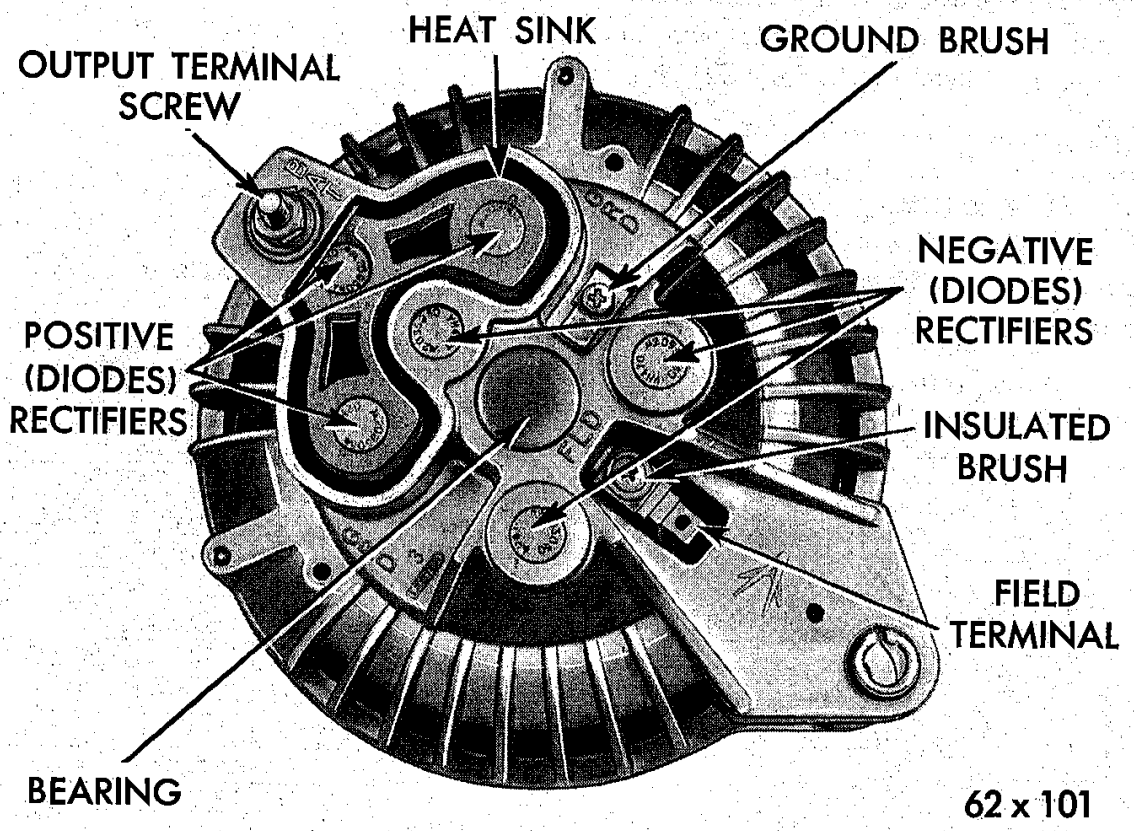
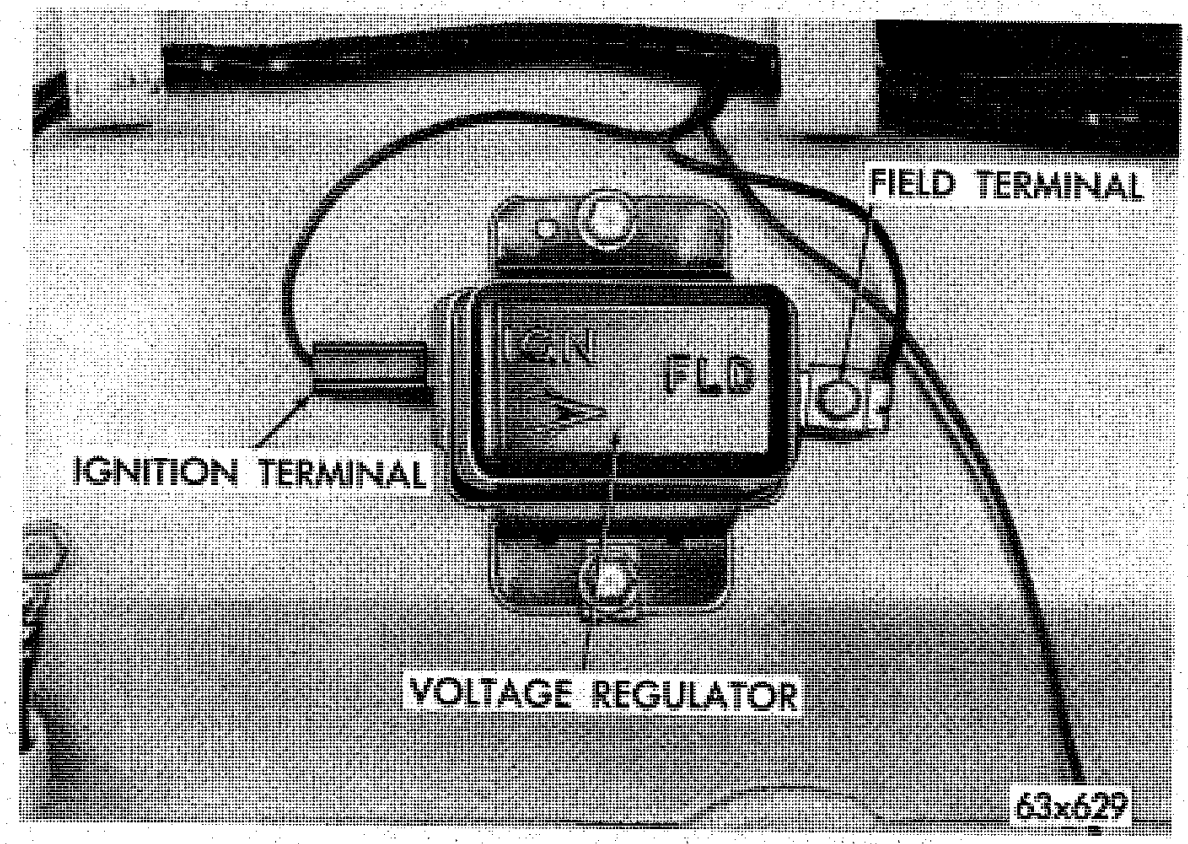


Figure 24 — Chrysler 8-Cylinder Alternator Assembly (All Models)



Fgiure 25 — Voltage Regulator (Assembled)

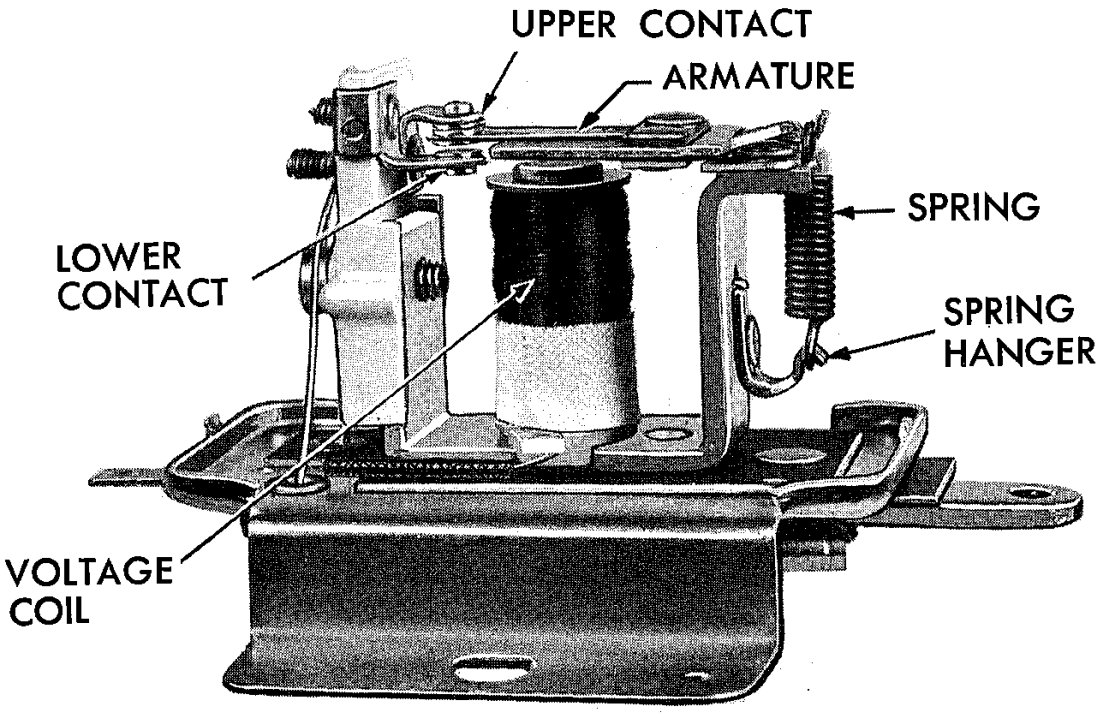


Figure 26 — Voltage Regulator (Cover Removed)

voltage regulator accomplishes this by controlling the flow of current in the rotor field coil and in effect controls the strength of the rotor magnetic field.

The voltage regulator has two sets of contacts using a common single armature (Fig. 26). The upper and lower stationary contact

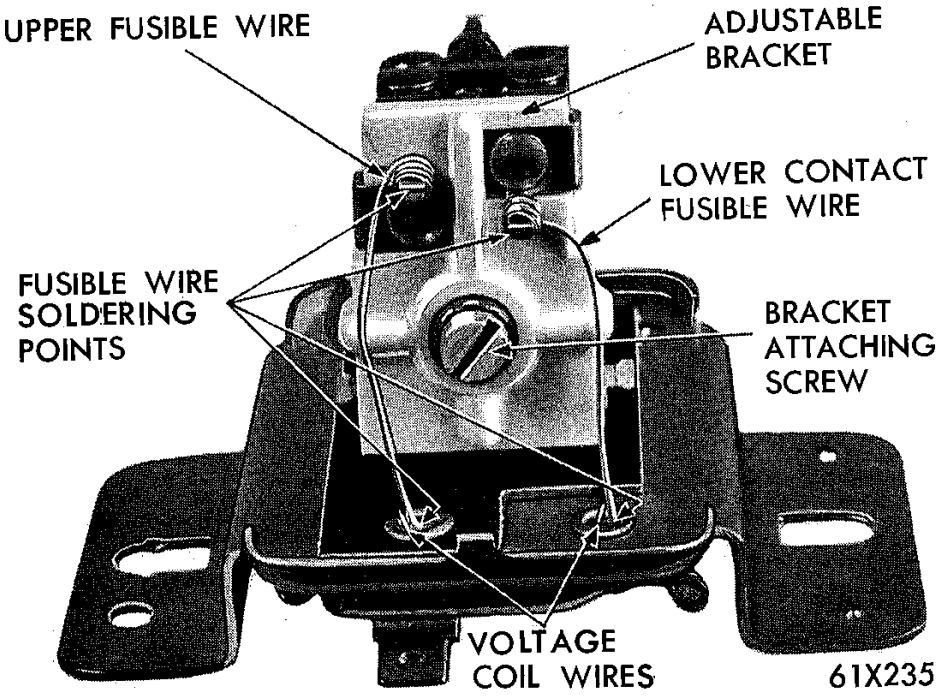


Figure 27 — Voltage Regulator Fusable Wires

brackets are mounted on a molded plastic bracket which is attached to the regulator frame by two screws. The upper contact bracket is connected to the "IGN" terminal by a fusible wire (Fig. 27). The lower contact bracket is connected to ground by a fusible wire. The armature is connected to the insulated "FLD" terminal.

IMPORTANT: Extreme caution must be exercised when installing a battery, attaching a battery charger or using a booster battery to start the engine, in order to prevent extensive damage to the electrical circuits which can resuit from reverse polarity or excessive voltage.

In all cases where a "Fast Charger" type battery charger is to be used, both of the battery cables must be disconnected from the battery. Never use a "Fast Charger" as a booster to provide starting voltage.

When using a booster battery the negative lead of the booster battery must be connected to the negative (ground) terminal of the battery and the positive lead to the positive terminal of the battery.

CAUTION: Reversing the polarity on an alternator system will immediately burn out the wiring harness and may possibly damage the alternator. (See Schematic Wiring Diagram, (Fig. 22 and 23).

Starting System

The Starting System consists of a 12-volt starting motor with an actuating switch mounted on the starting motor and a battery to starter solenoid switch cable. With the ignition switch key turned to the "ON" position and the transmission lever in neutral position (Power Torque & Automatic Transmission), pressing the starter button on the control panel, current from a 12-volt battery energizes the magnetic switch in the solenoid closing the relay switch — the circuit from the battery to the starting motor is then completed through the battery cables and the solenoid switch.

Ignition System

The ignition distributor is driven by a shaft which engages the oil pump shaft. The distributor times and distributes ignition current.

With the engine running, an electrical current flows from the ignition switch through the primary winding in the coil to the ignition points in the distributor and then to ground. As this circuit is interrupted, an induced high tension (voltage) current is started in the coil. This high tension current flows from the tower on the coil to the center tower of the distributor cap and to the rotor under he cap. The rotor distributes the current to the end towers of the cap and the eight wires carry the current to the spark plugs.

The ignition points in the distributor constitute an off-and-on switch in the primary circuit. A condenser in the primary circuit is also located in the distributor. The condenser absorbs the electrical surge which is produced each time that the ignition points break the circuit. The condenser reduces arcing at the points and hastens the collapse of the magnetic field in the coil.

An automatic centrifugal advance built into the distributor provides proper ignition timing in relation to engine speed in conjunction with an automatic vacuum spark advance system which increases part throttle fuel efficiency.

Spark Plugs

Standard spark plugs supplied are as follows:

Engine Models	Spark Plugs (Champion)
H-318	J10Y
HB-318	J10Y
HC-318	J10Y
HT-318	J10Y
H-361	J12Y
HB-361	J12Y
HC-361	J12Y
HT-361	N-6
H-413	J12Y
HB-413	J12Y
HC-413	J12Y
HC1-413	J12Y
HT-413	N-6

The gap at the spark plug electrodes should be set at .035 inch.

CARBURETOR AIR CLEANERS — (OPTIONAL EQUIPMENT)

Oil Bath Type

An oil bath air cleaner, shown in Fig. 28, is provided on most engines to afford maximum protection against dirt, dust and abrasives entering the engine. Under normal conditions, the air cleaner should be examined at each recommended crankcase oil change interval. If the sump is found to contain a semi-solid mixture of dirt and oil up to the lower offset in the reservoir, the air cleaner should be removed and thoroughly cleaned. Remove cover and filter element assembly, rinse clean in kerosene and drain. Empty the dirty oil from the reservoir, clean out the sump, and refill to indicated level with the following viscosity engine oil:

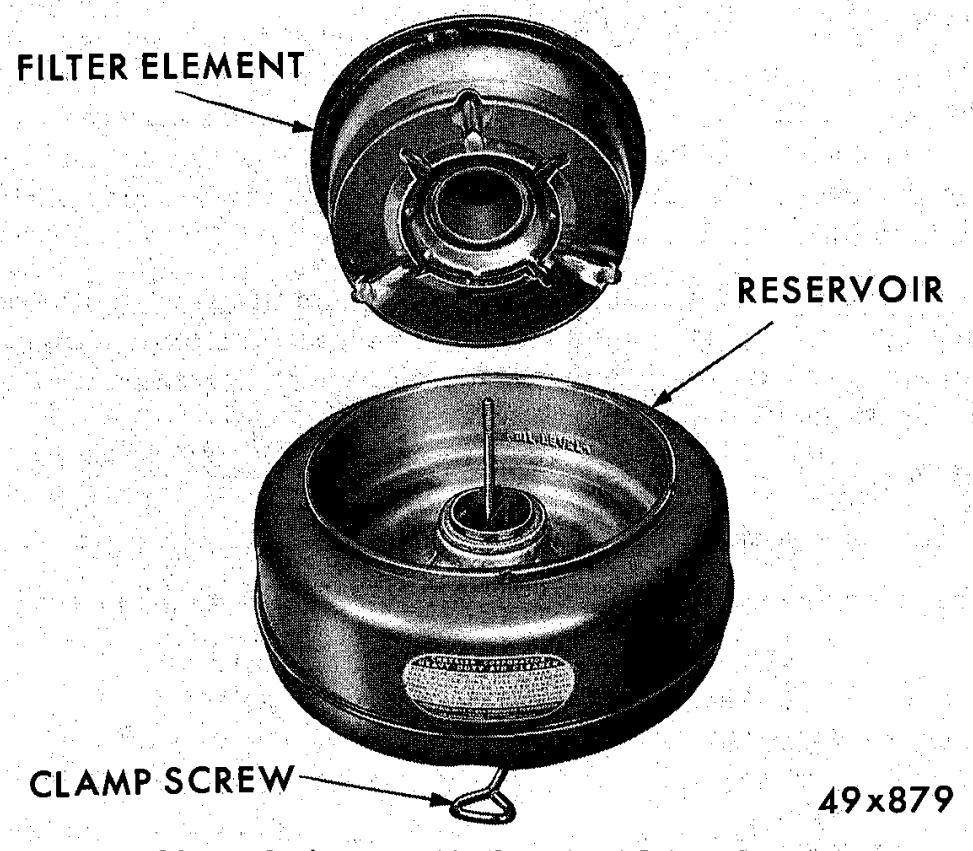


Figure 28 — Carburetor Air Cleaner (Oil Bath Type)

Above + 32°F	SAE 30
Below + 32°F	SAE 20W

IF THE ENGINE IS OPERATED IN DUSTY TERRITORIES, THE AIR CLEANER WILL REQUIRE MORE FREQUENT ATTENTION. FOR EXTREME CONDITIONS SERVICING THE CLEANER AS OFTEN AS ONCE A DAY MAY BE NECESSARY.

CARBURETOR AIR CLEANER — DRY TYPE — (OPTIONAL EQUIPMENT)

The filter element should be cleaned every 50 hours under normal service conditions. (Fig. 29)

Remove cleaner assembly, remove paper element, blow out dirt gently with air hose. Direct air from inside out, and keep nozzle one inch away from element to avoid damaging.

DO NOT TAP OR IMMERSE ELEMENT IN LIQUID

Wash the cleaner cover and body with cleaning solvent, and wipe dry. Replace paper element, center and secure firmly. Replace cleaner assembly on engine.

All engines operating in dusty areas will require more frequent attention. For this type of service it is recommended that an oil bath type air cleaner be used.

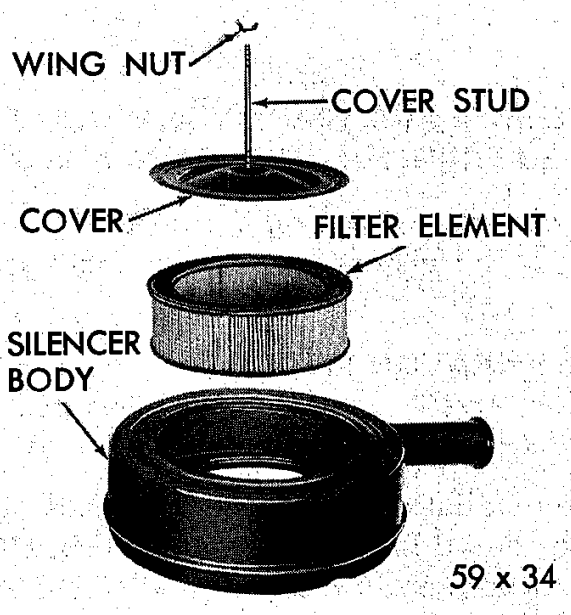


Figure 29 — Carburetor Air Cleaner (Dry Type)

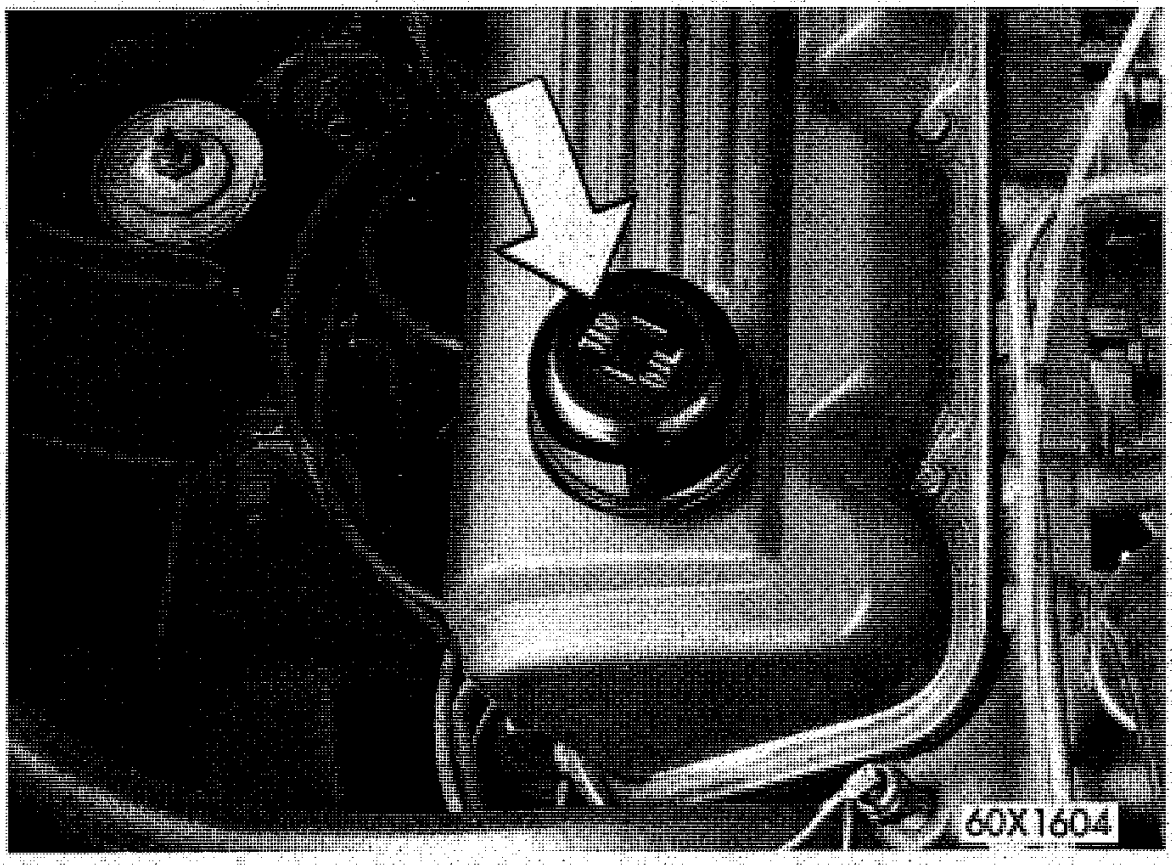


Figure 30 — Oil Filler Filter Cap Air Cleaner

OIL FILLER PIPE AIR CLEANER AND CRANKCASE VENTILATOR OUTLET PIPE AIR CLEANER (WHEN SO EQUIPPED) (FIGURES 30 AND 31)

Wash thoroughly in kerosene, re-oil with SAE 30 engine oil at each recommended crankcase oil change interval or more frequently under dusty conditions.

CLOSED CRANKCASE VENTILATION SYSTEM
(Standard Equipment on HT-361 and HT-413 Models and Optional Equipment on all Other Models)

Closed crankcase ventilation is effected by means of air drawn into the crankcase through the oil filler cap on all H, HB, HC Models (Fig. 32) and through the carburetor air cleaner on all HT Models. The air is circulated through the engine, and drawn out of the right cylinder head cover together with crankcase fumes by manifold vacuum into the combustion chambers and dispelled with the exhaust gases (Fig. 33).

The system consists of the ventilation valve installed on the outlet vent cap on the right cylinder head cover on Models H, HB, HC. The valve is installed in the intake manifold on the HT Models. A rubber

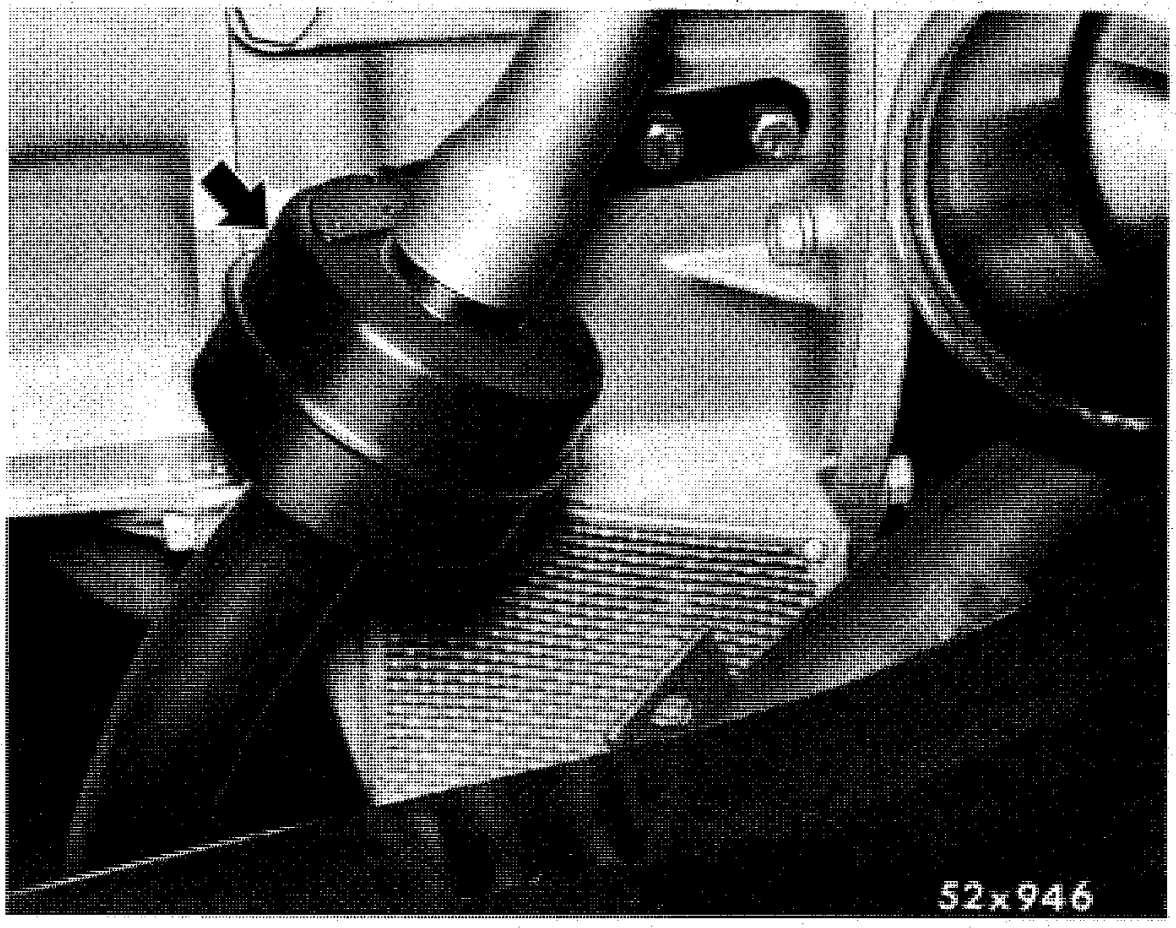


Figure 31 — Crankcase Ventilator Outlet Pipe Air Cleaner

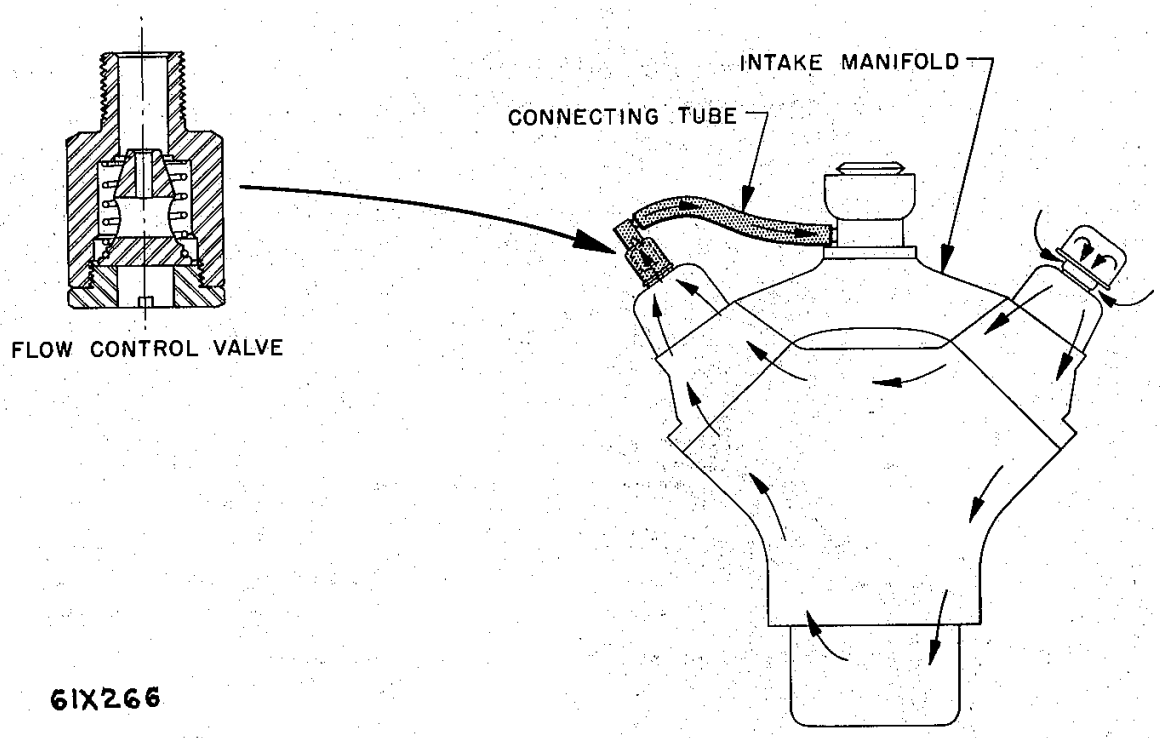


Figure 32 — Closed Crankcase Ventilator System Models H, HB, HC

tube (capable of withstanding 20 inches of vacuum) is connected between the outlet vent cap and the lower part of the carburetor throttle body or spacer on Models HB, HC. A metal tube is connected between the outlet vent cap and the intake manifold on Models HT. The function of the valve is to regulate the flow of crankcase ventilation at various throttle positions.

The system will operate effectively as long as normal maintenance is applied. The valve and tube are subject to fouling with sludge and carbon formation due to the nature of the materials carried through the ventiliating system.

SERVICE PROCEDURES

At regular intervals of 100 hours, the regulating valve and the connecting tube should be removed from the engine, disassembled and cleaned thoroughly.

NOTE

Under cold weather operation conditions, when engines are operated at slow speeds with low engine temperatures, more rapid accumulation of harmful fumes may be present in the engine. Under these conditions of operation the valve and tube must be cleaned more frequently than specified above. No specific hourly recommendation, however, can be made under these conditions. Frequency of cleaning must be dictated by experience.

Disassemble the valve (Fig. 34) and clean the valve parts with any good solvent cleaner and blow dry with compressed air.

When reassembling the valve parts, be sure to attach the spring on the valve by pushing the end coil over the tapered end of the valve, over the ridge and into the groove machined just under the head of the valve. **THIS IS VERY IMPORTANT.**

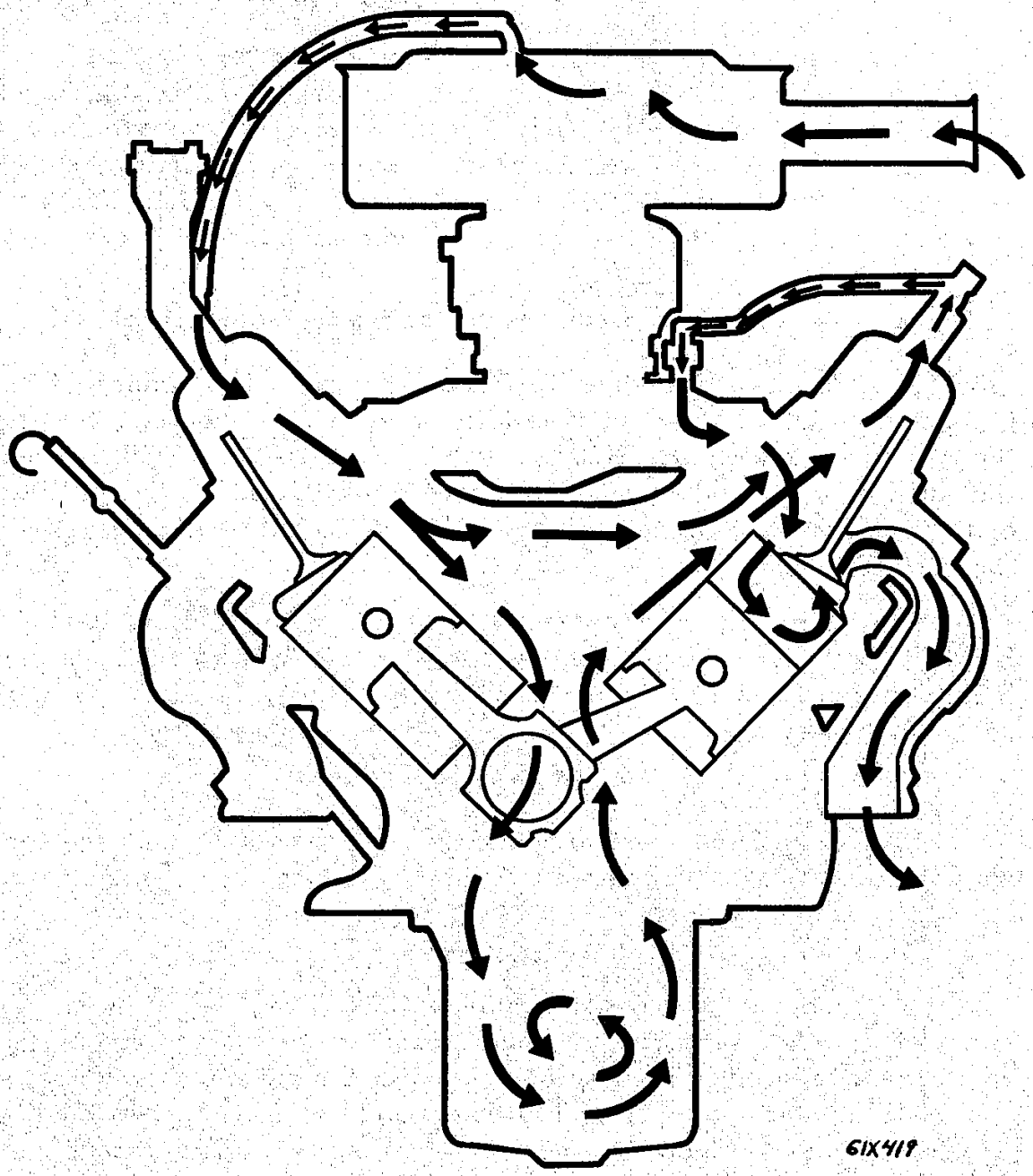


Figure 33 — Closed Crankcase Ventilating System Models HT-361, HT-413

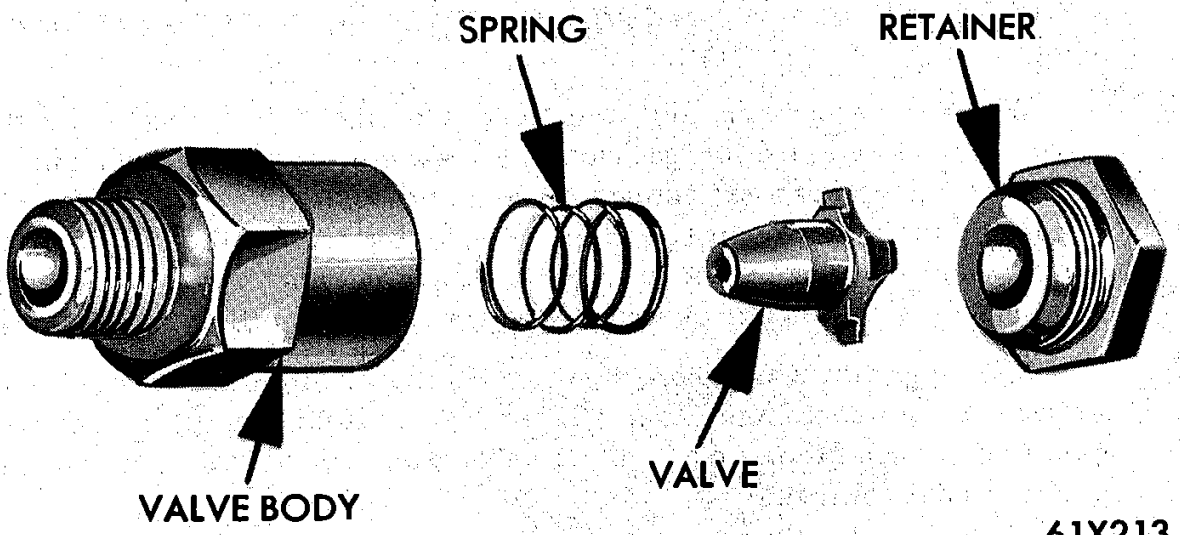


Figure 34 — Crankcase Ventilation Valve Assembly (Disassembled)

Unless the spring is properly assembled, the valve will not contact the valve seat squarely and will not close properly. Consequently, the engine will not idle properly due to the entrance of too much air into the intake manifold. If the spring has been stretched the same trouble may occur.

If improper action of the spring is suspected due to spring being distorted, bent or etched from corrosive action, the valve assembly should be replaced.

EXHAUST SYSTEM

Exhaust from the combustion chambers passes through the exhaust valve ports into the exhaust manifold and out through the exhaust pipe. The H, HB, HC, HC1, V-8 Industrial Engines are equipped with a manifold heat control valve, which permits faster warmup of the engine by diverting exhaust gas from the right engine bank through a by-pass port and hot spot chamber in the intake manifold and out through the left exhaust manifold. The HT-361 and HT-413 engines employ a water heated intake manifold where hot water is continuously circulated around the intake manifold carburetor flange mounting pad, and do not have a manifold heat control valve.

The manifold heat control valve is located between the right exhaust manifold and the exhaust pipe. It consists essentially of a butterfly type valve operating on a shaft in a housing. Movement of the valve is controlled by a flat coil spring and a counterweight. The inner end of the spring fits in a slot in the valve shaft; the outer end contacts one of two stop pins; which also serve to limit travel of the valve. The counter-

weight fits over the outer end of the valve shaft, and is held with a key and clamp bolt. Bumpers and an anti-rattle spring keeps the mechanism quiet.

When the engine is cold, the tension of the coil spring holds the valve in the closed position, restricting the exhaust passage. As the engine warms up, the spring loses enough tension to permit the counterweight to rotate the shaft and open the valve. The outer end of the spring must contact the correct stop pin to provide proper spring tension. Otherwise the counterweight cannot overcome the spring tension to open the valve.

The heat well which actuates the carburetor automatic choke is located in the hot spot chamber of the intake manifold. Therefore, efficient operation of the automatic choke depends upon proper functioning of the manifold heat control valve.

MANIFOLD HEAT CONTROL VALVE

Each time the engine is lubricated, apply Manifold Heat Control Valve Solvent, MoPar Part Number 1879318, to ecah end of the valve shaft when the manifold is cool. Work the valve back and forth a few times to distribute the solvent and to be sure the valve is free. (Fig. 35)

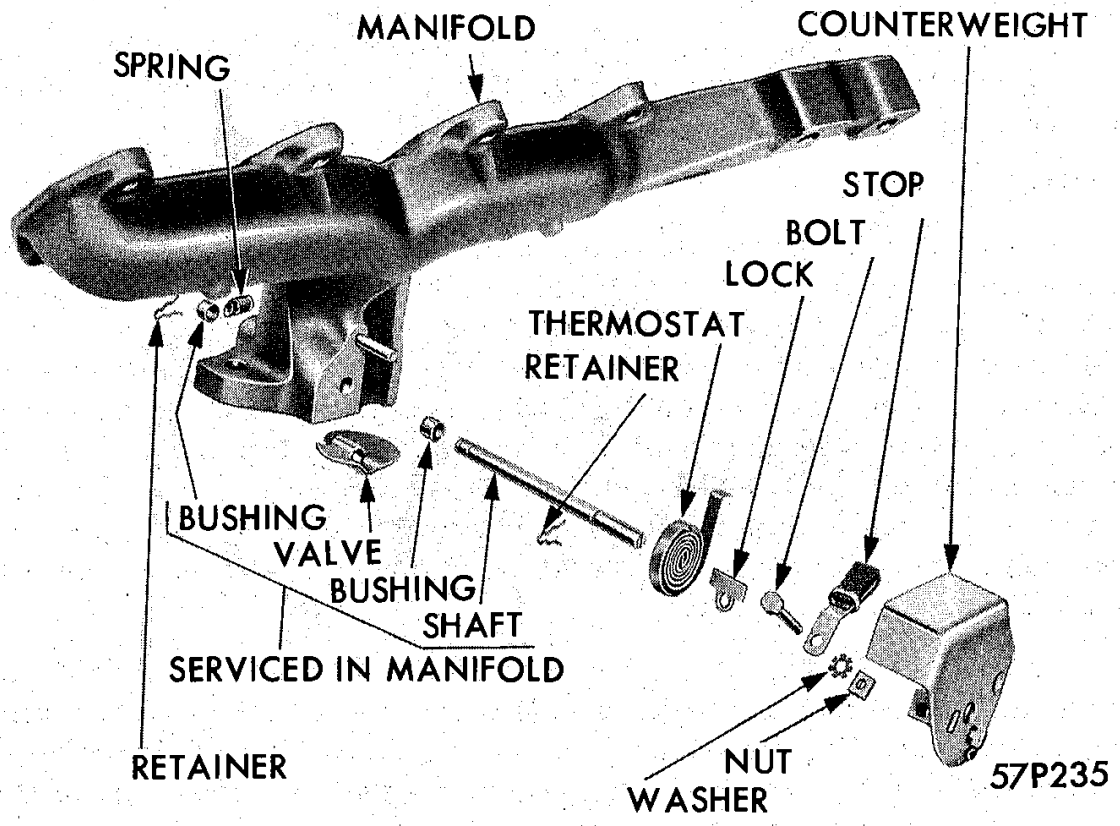


Figure 35 — Manifold Heat Control Valve (Disassembled)

COOLING SYSTEM (Figs. 36 and 37)

The belt driven centrifugal type water pump circulates water from the radiator, or heat exchanger, to the cylinder blocks, completely around each cylinder bore, out the top of the cylinder block into the cylinder heads, around the exhaust valve ports, into special passages to the ther-

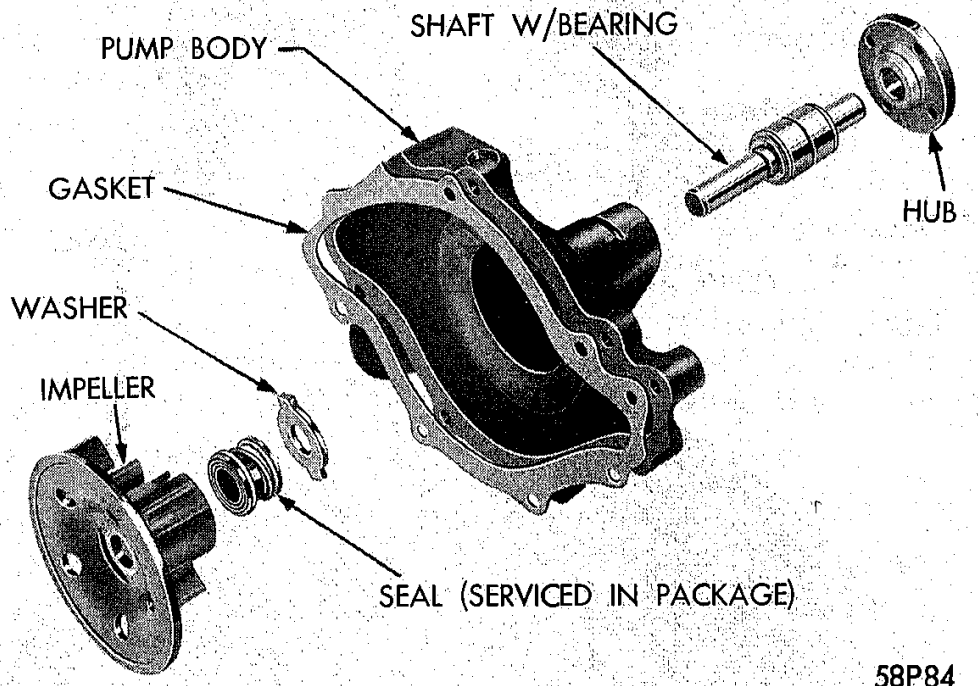


Figure 36 — Water Pump (Disassembled) Models H-318, HB-318, HC-318

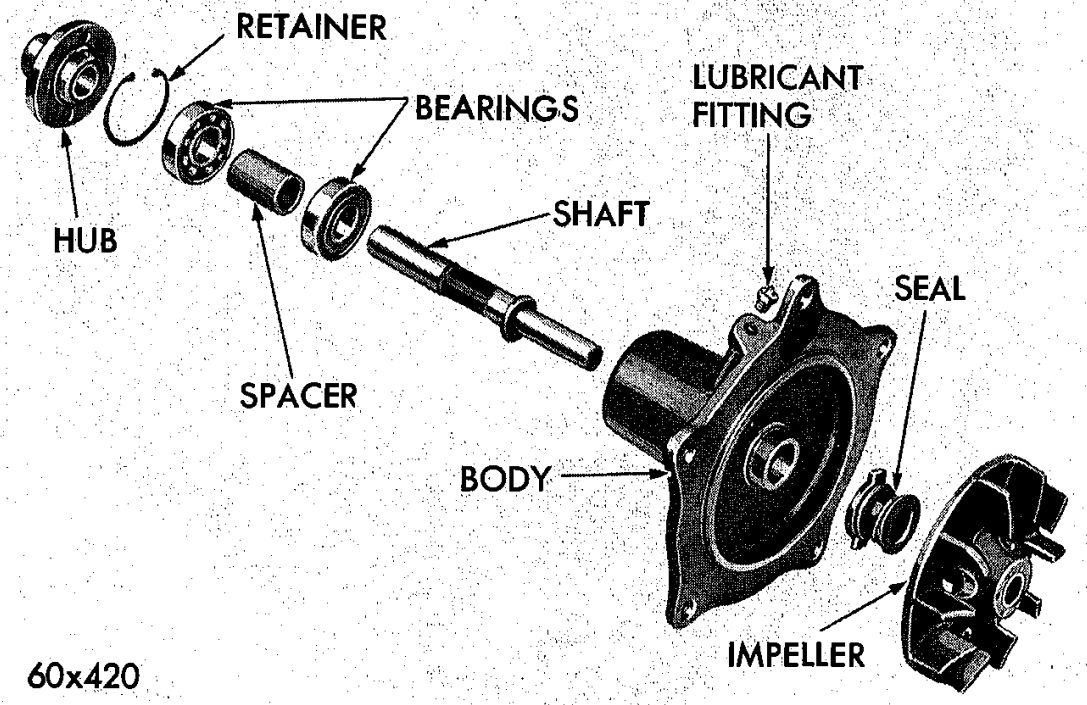


Figure 37 — Water Pump (Disassembled) Models H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413, HT-413

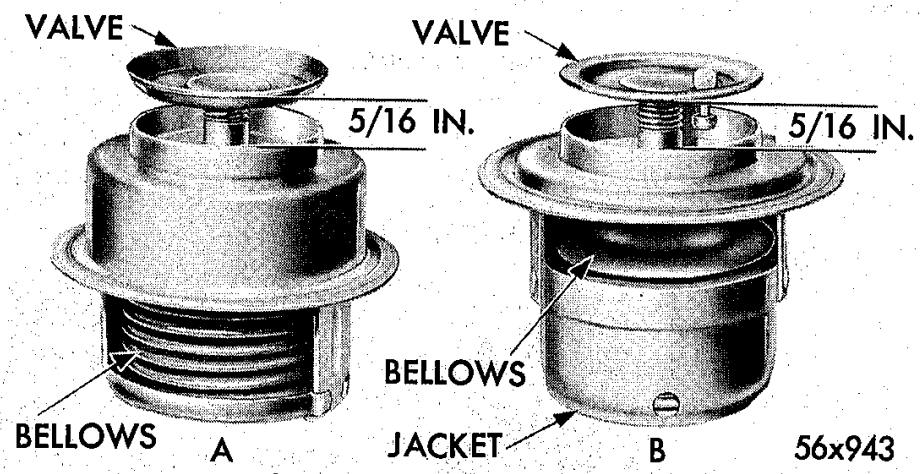


Figure 38 — Thermostats (Typical)

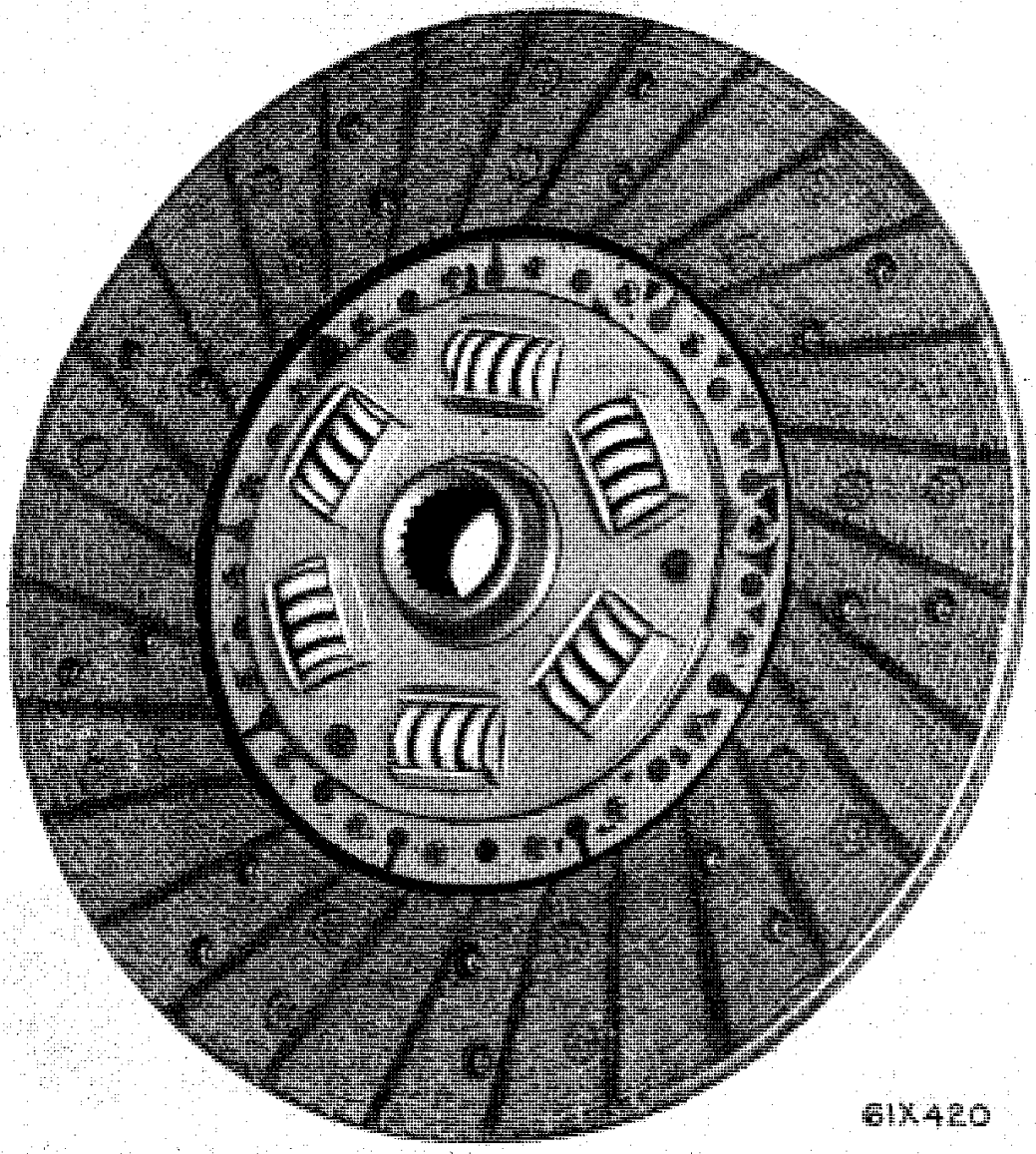


Figure 39 — Clutch Disc Assembly

mostat housing, for recirculation or return to the radiator, or heat exchanger.

THERMOSTAT

The thermostat as shown in Fig. 38 restricts water flow to the radiator until the water has reached a predetermined temperature, thereby permitting faster warm-up of the engine.

A by-pass passage and tube from the intake manifold on Models HT-361, and HT-413, provide circulation around the intake manifold carburetor mounting flange pad. On Industrial Units equipped with a Power Torque unit, an oil cooler is also connected to the cooling system.

Three drain cocks are provided for draining the cooling system, one in the radiator and one at each side of the cylinder block near the exhaust manifold outlet. All three must be open to drain the system completely.

CLUTCH (Fig. 39)

The type of clutch used is determined by the type of drive adaptation. On models equipped with an Industrial Torque Converter, the output shaft is attached to a flywheel which has the clutch assembly mounted on it. When the clutch is engaged, the clutch disc, which is splined to the transmission drive pinion, is clamped between the flywheel and the clutch pressure plate to transmit power to the transmission. Power flow through the clutch assembly is controlled by the clutch release fork and linkage to the clutch pedal or lever.

POWER TAKE-OFF (OPTIONAL EQUIPMENT)

The power take-off and clutch assembly (Fig. 40) used with some industrial engines is a heavy duty unit consisting of a three section dry disc clutch and a drive shaft enclosed in a special housing which is bolted to the engine by means of a flywheel housing. The clutch drive ring is attached to the engine flywheel and drives the pressure plate by means of internal gear teeth. When the clutch is engaged, the pressure plate is clamped between the discs, engaging the clutch body which is keyed to the drive shaft. The drive shaft is supported by a double row ball bearing at the front and by two tapered roller bearings at the rear of the housing. The clutch release lever controls the clutch release bearing through a clutch yoke which engages the clutch release bearing trunnion. Positive disengagement of the clutch mechanism is accomplished through a toggle arrangement acting in conjunction with the return springs. A threaded adjusting nut in the clutch provides a means of compensating for wear.

TRANSMISSION

The Chrysler 8-Cylinder Industrial Engines use one of the following

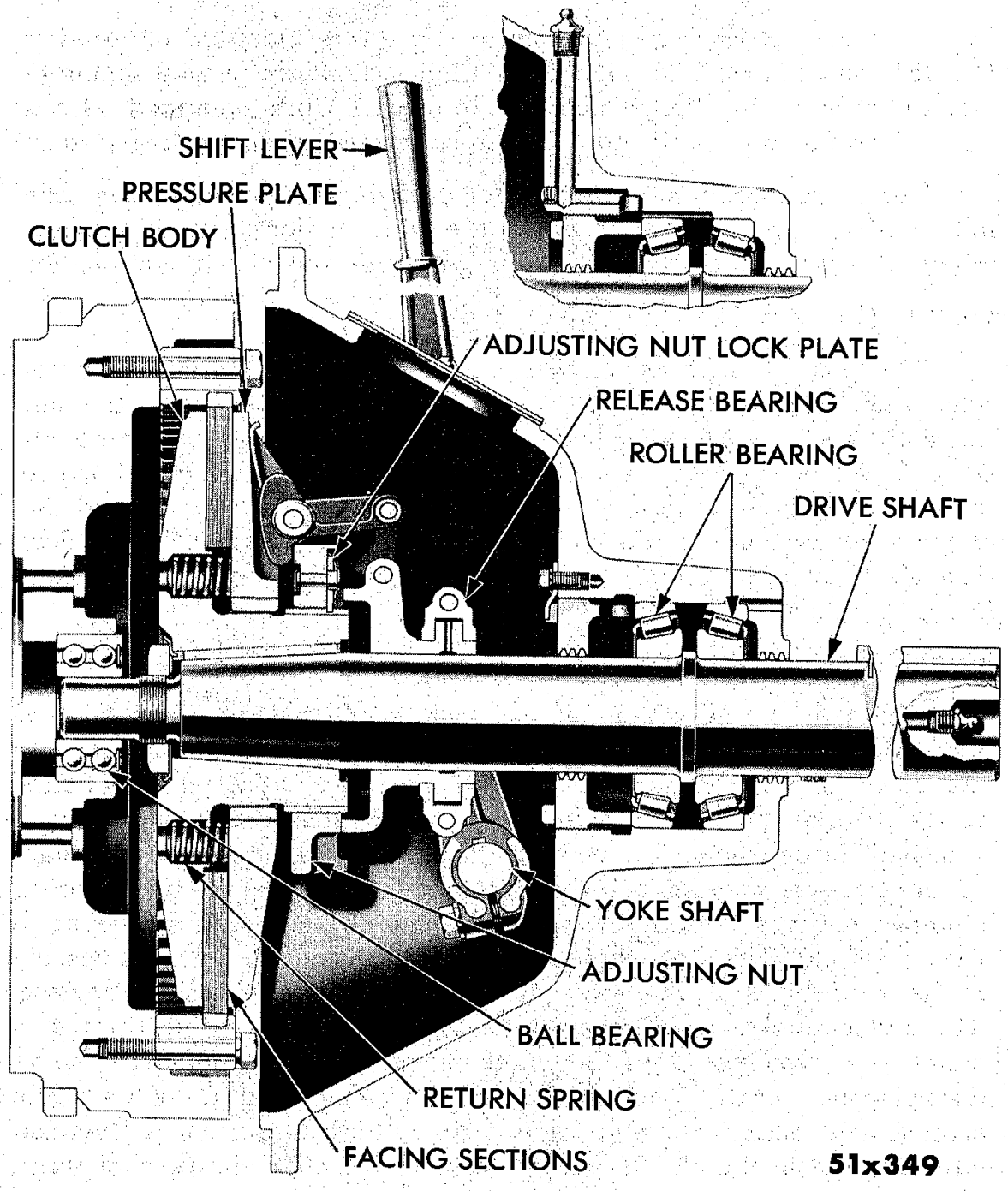


Figure 40 — Power Take-Off with Heavy Duty Clutch (Sectional)

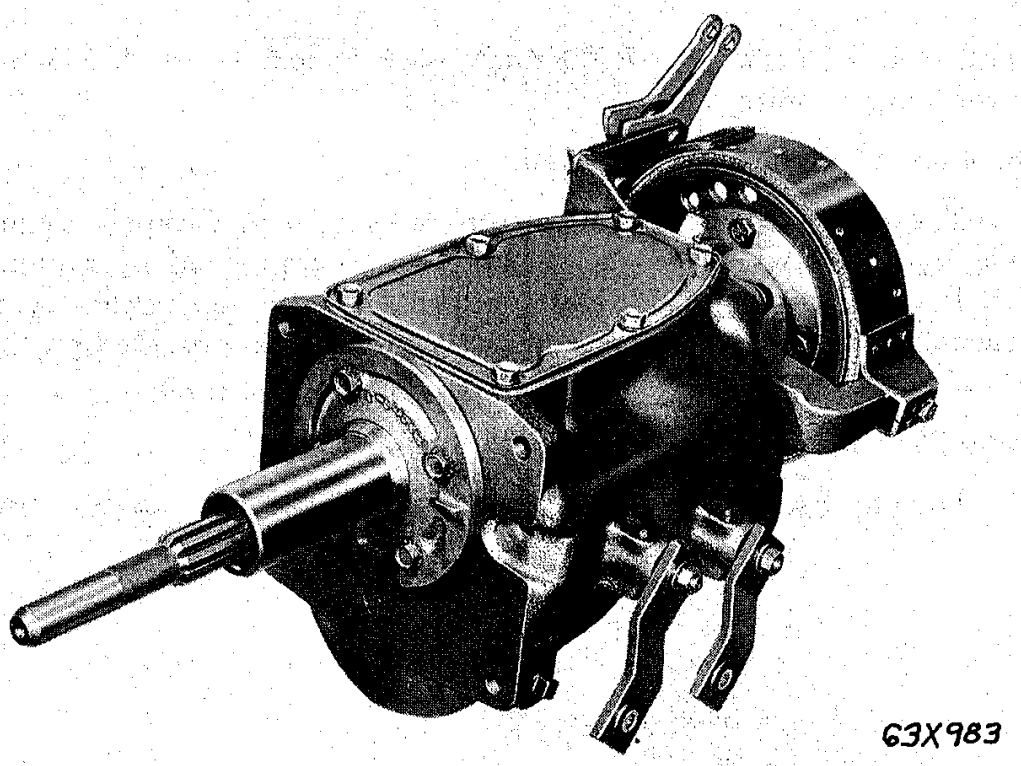


Figure 41 — Transmission Assembly 3-Speed (Model A745)

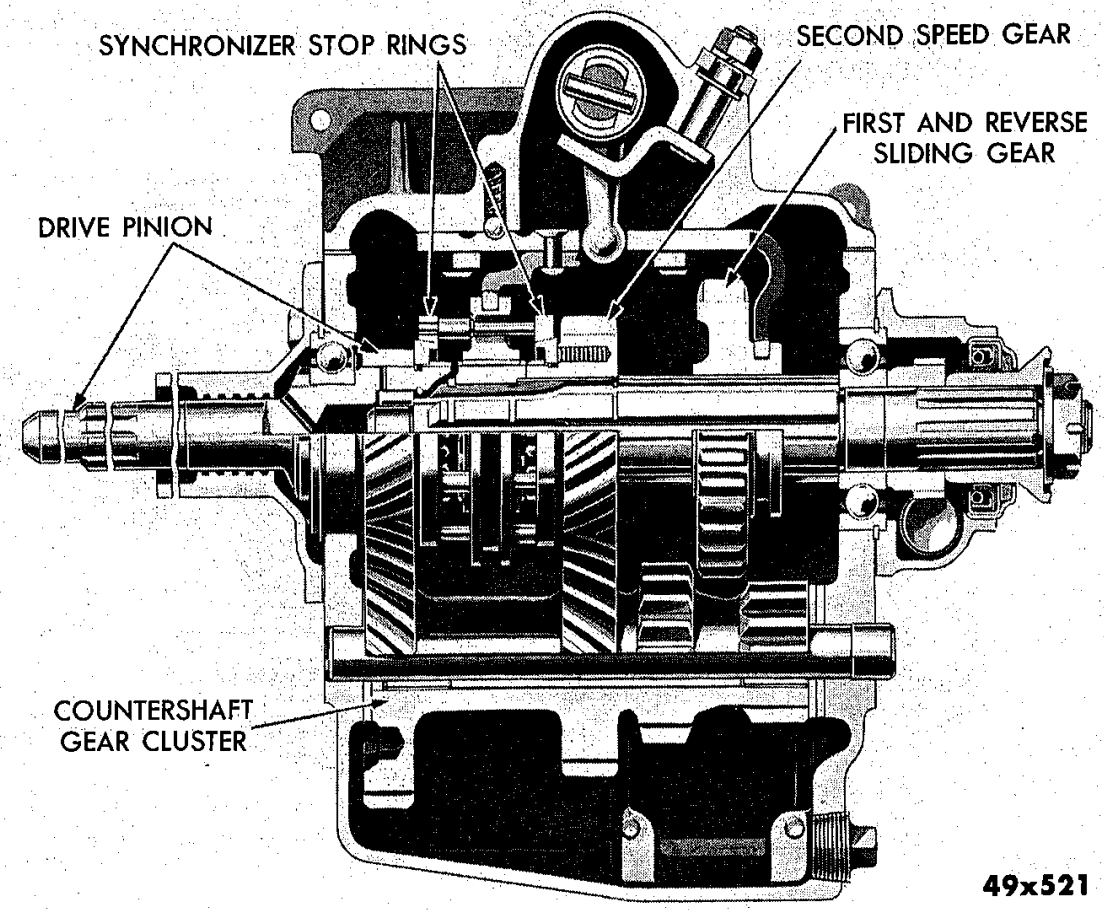


Figure 42 — Transmission Assembly 3-Speed (Model T87E)

transmissions (Figs. 41, 42, 43 and 44) 3-Speed, 4-Speed, 5-Speed or Power Torque units.

Model A745 Transmission (3-Speed)

The three speed manual transmission is a synchromesh type with helically cut gears. The gear selection is accomplished by moving the shift lever through the "H" shift pattern. Gearshift operating levers are attached to the shafts mounted directly into bosses provided on the left side of the transmission case.

Model T87E Transmission (3-Speed Extra Heavy Duty)

The three speed extra heavy duty manual transmission is a synchro-

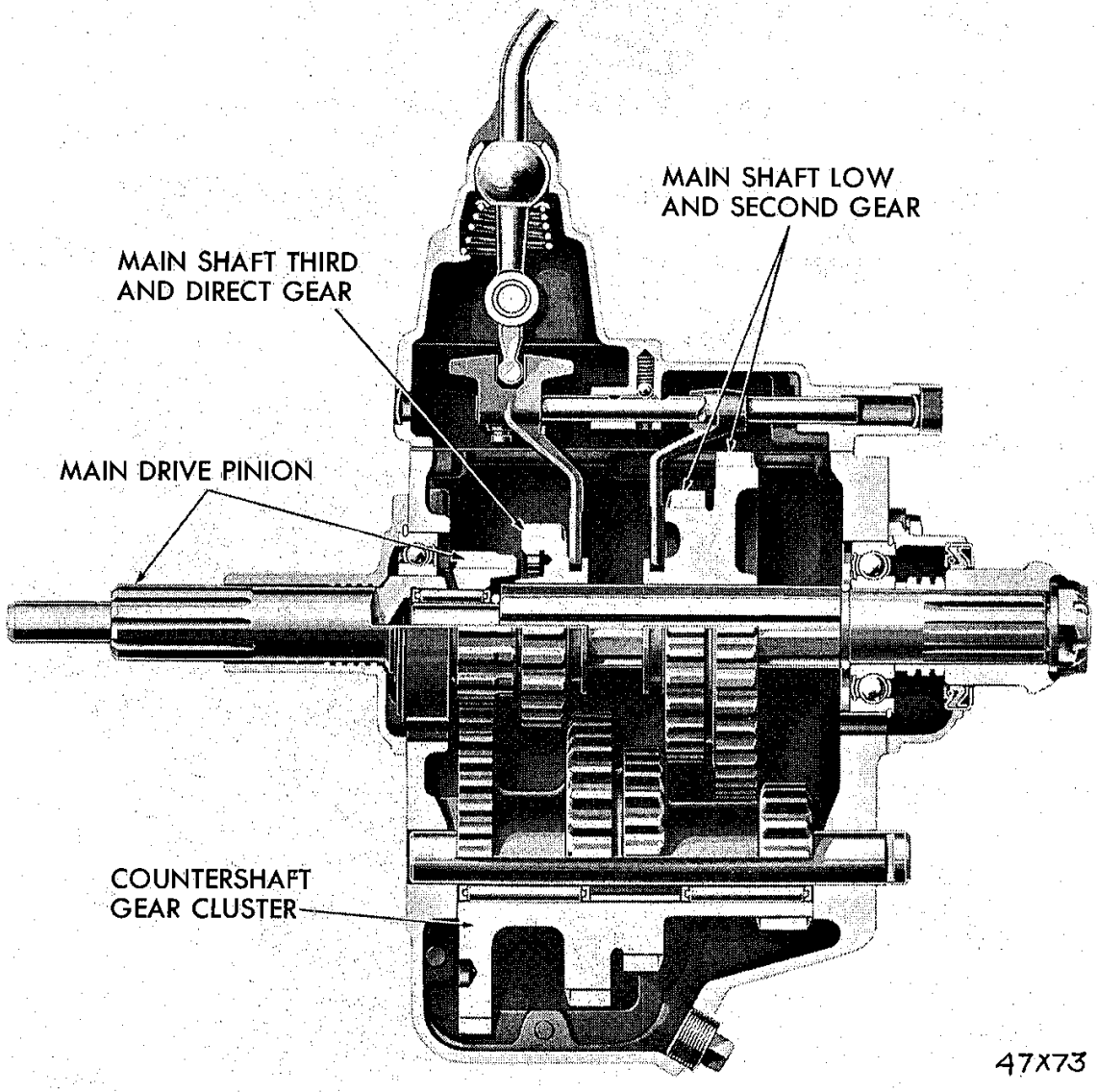


Figure 43 — Transmission Assembly 4-Speed (Model 420)

mesh type with helically cut gears. The gear selection is accomplished by moving the lever through the "H" shift pattern.

Model 420 Transmission (4-Speed)

The four speed manual transmission is a rugged exceptionally smooth easy shifting transmission. All of the gears are of the helical design except 1st and reverse which are spur type. The countershaft and all its gears are a single unit. The engagement of the 3rd and 4th gear is aided by pin type synchronizers. (Fig. 45)

Model 433D Transmission (4-Speed)

The four speed manual transmission is a modified version of the

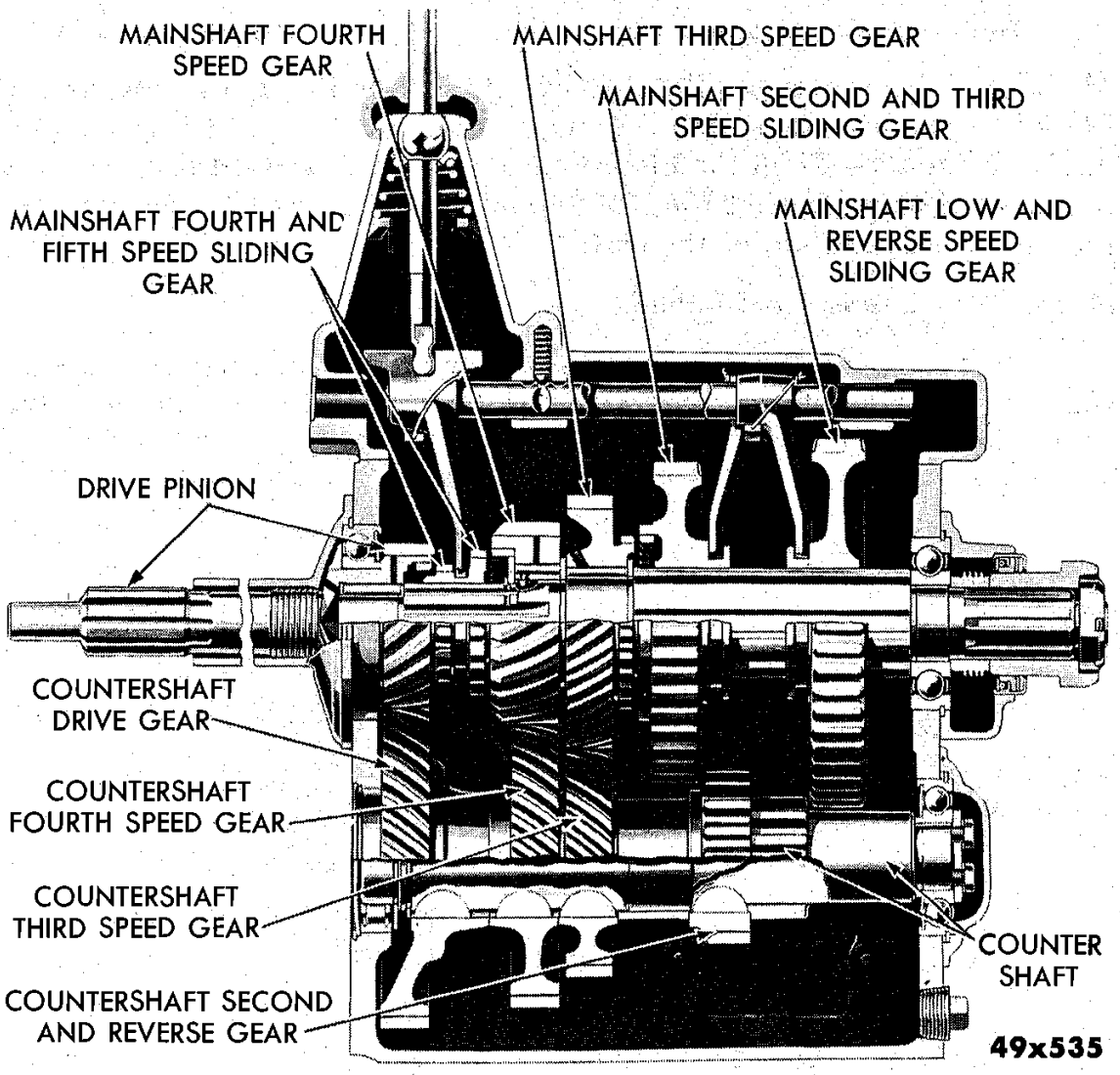


Figure 44 — Transmission Assembly 5-Speed (Model 540)

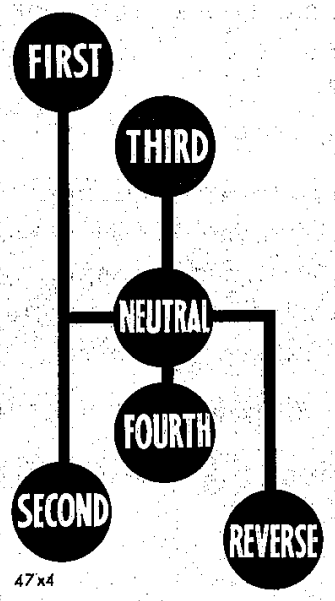


Figure 45 — Gearshift Lever Positions 4-Speed (Model 420)

Model 540 transmission. The Model 433D uses the same case as the Model 540 transmission, and the major difference is the 2nd speed gear has been excluded from the mainshaft assembly. The transmission cover remains the same as that used on Model 540 with the use of a stop for the 2nd speed position of the shift lever. (Fig. 46)

Model 540 Transmission (5-Speed)

The five speed manual transmission with high ratio first and reverse gears provides greater torque multiplication than is available with the

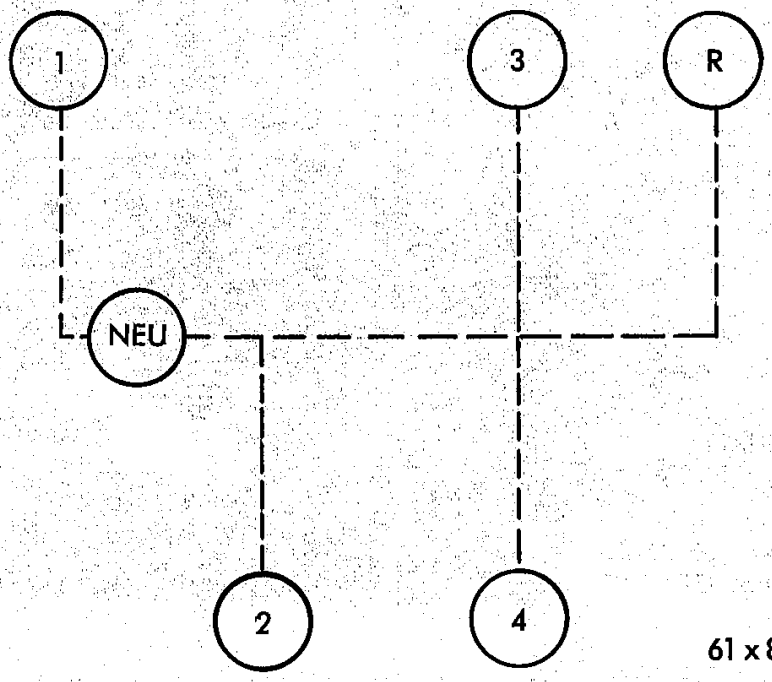


Figure 46 — Gearshift Pattern 4-Speed Transmission (Model 433D)

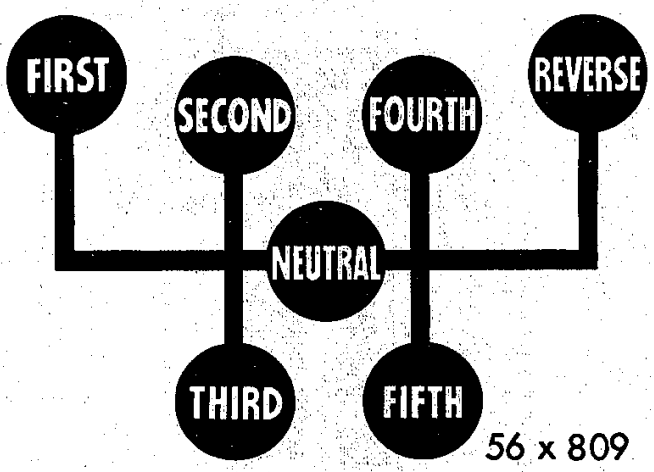


Figure 47 — Gearshift Lever Positions 5-Speed (Model 540)

four speed transmission. All of the gears are of the helical design except first and reverse which are the straight spur-type. (Fig. 47)

LOADFLITE TRANSMISSION (3-Speed Automatic)

The three speed automatic LoadFlite Transmission combines a torque converter with a fully automatic three speed planetary gear system. (Fig. 48)

The transmission is operated by a gearshift control unit consisting of five push buttons (Fig. 49) identified by R (Reverse), N (Neutral), D (Drive), 2 (Second) and 1 (Low).

In the drive range, the transmission shifts through all three ratios automatically. The shift points are determined by throttle opening and the unit speed.

The second position range is used to operate the transmission in the first two ranges only. This range is suitable for heavy or slow operation where the operator may desire part throttle only.

Power Torque (Optional Equipment)

The Chrysler "Power Torque" is offered in three versions and provides a compact, versatile and economical means of power take off on all industrial engines.

The three versions are:

(1) An in-line PTO.
(2) A right angle PTO.
(3) Several transmission adaptations (Fig. 50) covering tower and remote shift manual transmissions.

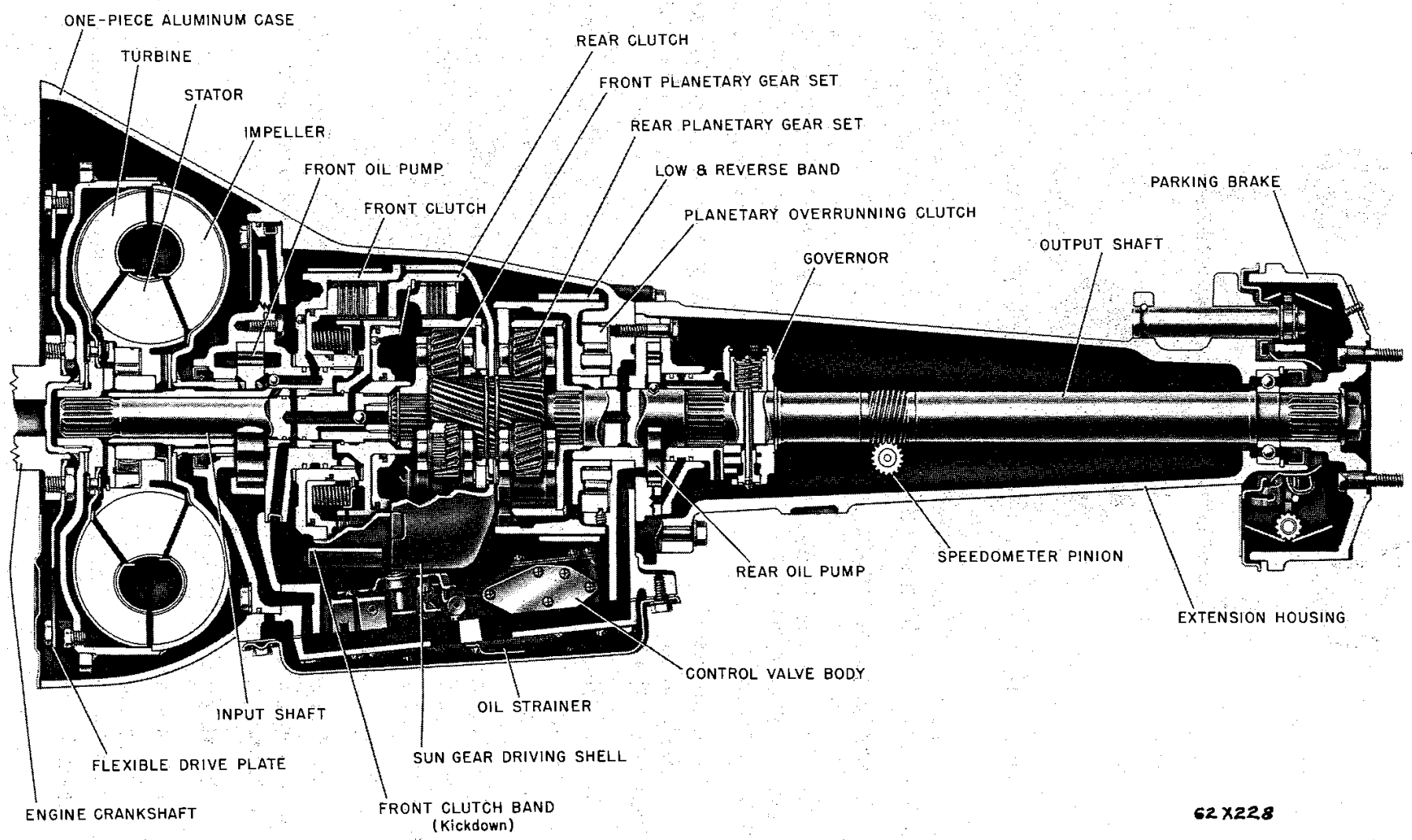


Figure 48 — Automatic Transmission 3-Speed (Model 727)

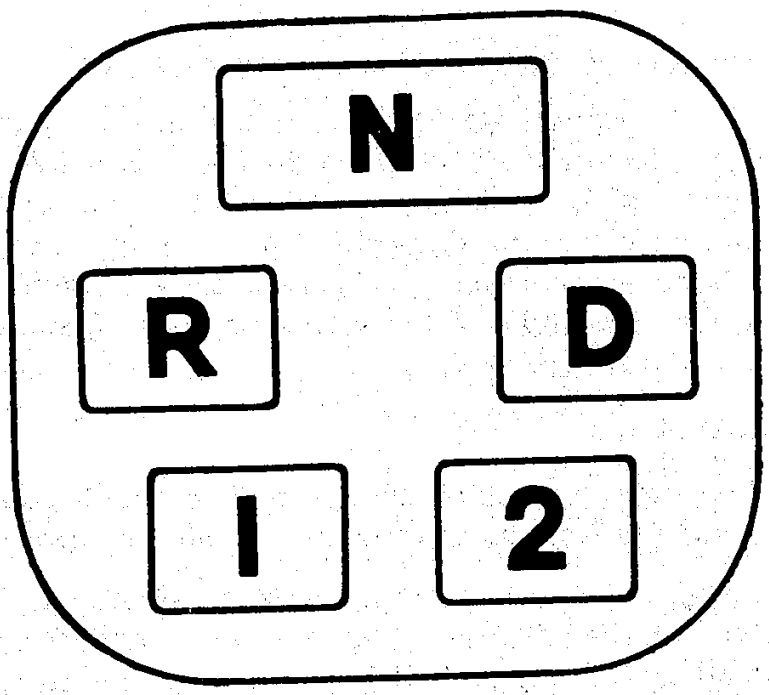
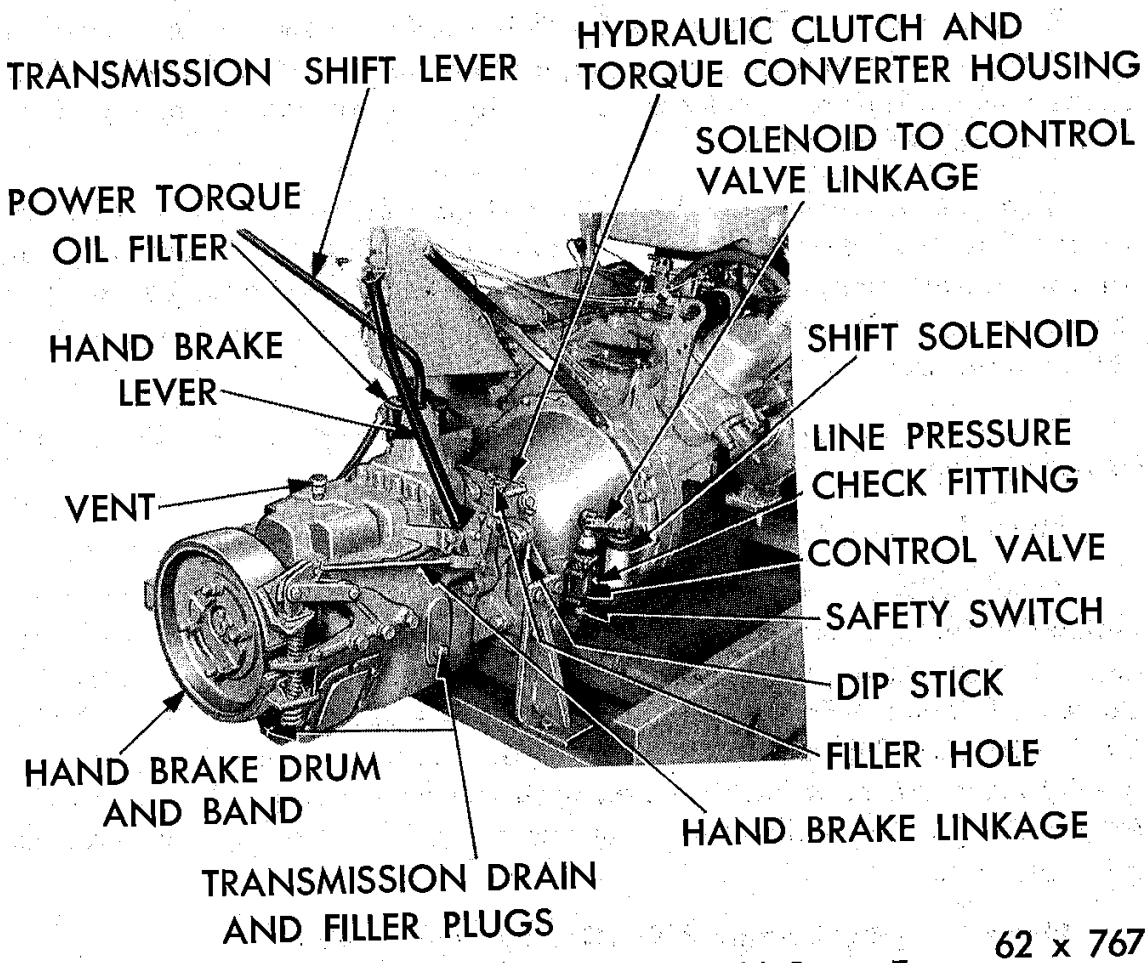


Figure 49 — Gearshift Control Unit



62 x 767

Figure 50 — Transmission Adaptation with Power Torque

Common component parts for all three versions are:

(1) A integral torque converter housing and adapter plate.

(2) A torque converter of 11¾ inch diameter with 2.20 stall ratio or a torque converter of 12½ inch diameter with 2.26 stall ratio.

(3) A hydraulic clutch housing and oil pan containing an oil pump, regulator, valve body, manual valve and neutral safety switch.

(4) A wet type hydraulic clutch with four discs (8 surfaces).

(5) An oil cooler.

Power Torque Control Valve

Positioned on the right side of the hydraulic clutch housing (facing the engine from the rear) is the electrically operated control valve.

The oil pan dip stick is located on the right side of the hydraulic clutch housing and on the left side of the hydraulic clutch housing is the combination breather vent cap and oil filler plug. There is an oil capacity of approximately 7.2 quarts "full" and Automatic Transmission Fluid Type "A" Suffix "A" is used.

The oil must be changed every 250 hours or 3 months of operation whichever occurs first for normal operation and every 200 hours or 2 months of operation, whichever occurs first for prolonged heavy duty operation in hot weather.

The line pressure should be checked periodically to obtain efficient service. The line pressure must be measured at 1500 input rpm with the fluid at normal temperature. The minimum pressure should be 100 psi; the maximum 120 psi. Most Power Torque units will measure 105 to 115 psi line pressure.

The mounting pads are common for all phases since they are incorporated on the hydraulic clutch housing.

Phase I — Straight In-Line PTO (Optional Equipment)

Along with the common component parts to all three phases, Phase I includes the splined "in-line" output shaft, adapter, output shaft bearing, oil shaft seal and companion yoke. Three yokes are available: Cleveland Yoke #555-1-229, Spicer Yoke #95188 and Spicer Yoke #SKU-108908. The straight line PTO output shaft bearing requires no special attention as it is lubricated with the transmission fluid from the Power Torque hydraulic clutch housing by means of oil splash and mist lubrication.

Phase II — Right Angle PTO (Optional Equipment)

The right angle PTO version contains two tapered roller bearings

which are assembled in an extension housing attached to the hydraulic clutch housing. The extension assembly supports the output shaft which has a 2¼ inch diameter shaft end with a ⅝ inch square keyway.

Lubrication is provided the two tapered roller bearings in the extension housing by means of a drilled passage in the output shaft depositing transmission fluid in the extension housing sump. An oil return hole in the back of the power unit hydraulic clutch housing maintains the required oil level in the extension housing so that the bottom of the two roller bearings are continuously rotating in oil.

The three speed automatic transmission combines a torque converter with a fully automatic 3-speed planetary gear system. The transmission is operated by a gearshift control unit consisting of five push buttons. (Fig. 49) The push buttons are identified by R (Reverse) N (Neutral), D (Drive), 2 (Second) and 1 (Low).

In the drive range, the transmission shifts through all three ratios automatically. Shift points are determined by throttle opening and the unit speed. The second position range is used to operate the transmission in the first two ranges only. This range is suitable for heavy or slow operation where the operator may desire part throttle only.

No special attention on the part of the operator is required to lubricate the right angle power take-off as oil is pumped to the extention housing and the proper oil level is automatically maintained.

Phase III — Transmission Adaptations (Optional Equipment)

The transmission versions consist of a modified transmission assembled to the hydraulic clutch housing by an adapter. The transmission contains a special input shaft that assembles to the hydraulic clutch. A tower shift and remote shift New Process Model No. 540-five speed manual transmissions are available as optional equipment.

These transmissions have their own independent lubricant supply and should be lubricated in accordance with the general lubrication recommendations given in this manual for transmissions under "General Lubrication".

OPERATING INSTRUCTIONS

PREPARATION OF A NEW ENGINE

Before placing a new or rebuilt engine in service, make a thorough inspection for evidence of damage or loose parts.

ENGINE OIL

See that the crankcase contains the correct amount of clean new SAE Engine Oil, conforming to the requirements of API Classification "For Service MS". After 25 hours of operation the crankcase should be drained and refilled with oil as recommended in the Lubrication Section.

COOLING SYSTEM

Fill the cooling system with water, using anti-freeze solution, if temperature requires it. In warm weather, the use of MOPAR Rust Resistor is recommended.

ENGINE ACCESSORIES

See that all points requiring lubrication are properly supplied. Check storage battery terminals to see that they are tight and clean. Check the electrolyte level in the battery.

ELECTRICAL CONNECTIONS

See that all electrical connections are tight and clean. Check each spark plug for tightness.

ATTACHING PARTS

See that all the nuts, bolts and screws that attach parts are secure. Tighten the cylinder head nuts with a torque wrench to 85 foot pounds torque, in sequence as shown in Figures 51 and 52 for Models H-318, HB-318 and HC-318, and 70 foot pounds torque on Models H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413 and HT-413.

PRESTARTING INSTRUCTIONS

When the engine is in daily use, inspect it daily and always before starting after a period of idleness.

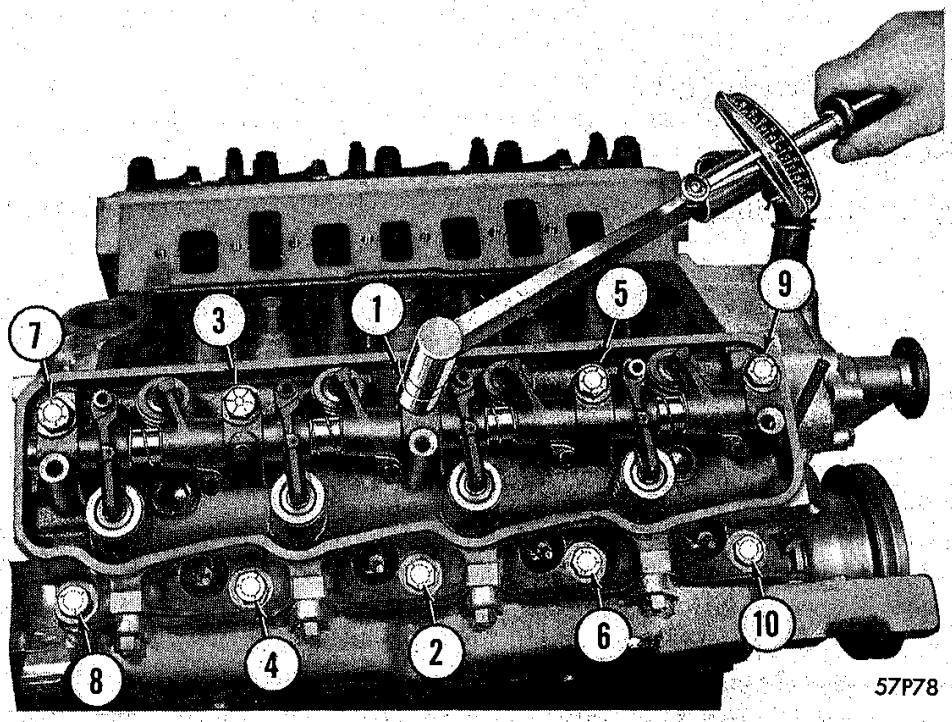


Figure 51 — Tightening Cylinder Head Bolts (Models H-318, HB-318, HC-318)

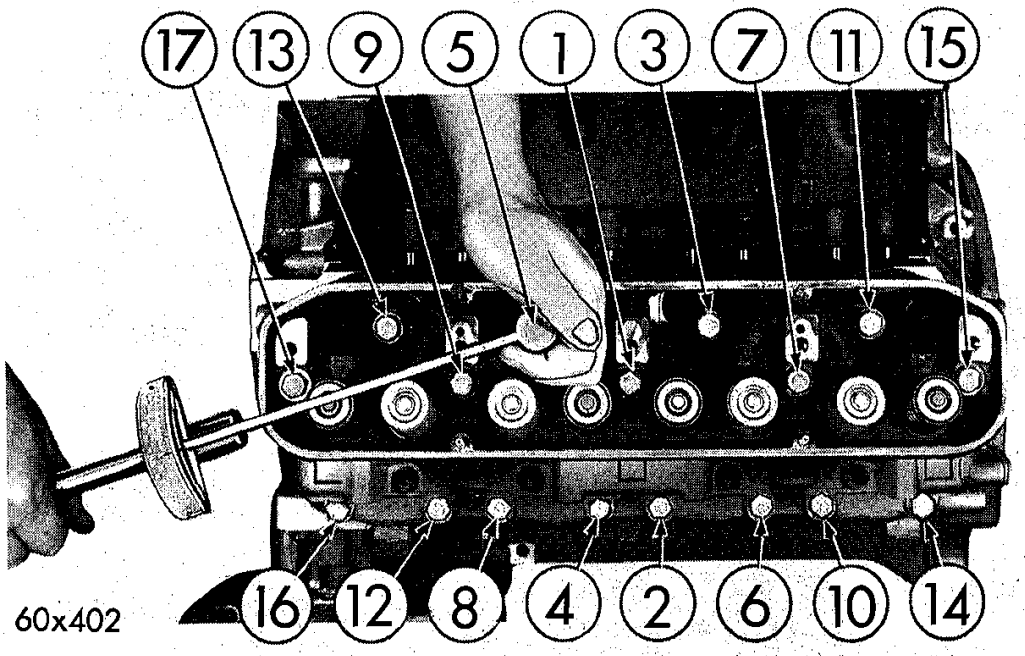


Figure 52 — Tightening Cylinder Head Bolts (Models H-361, HB-361, HC-361, HT-361, H-413, HB-413, HC-413, HC1-413, HT-413)

ENGINE OIL LEVEL

Inspect the oil level and add oil if required.

FUEL

Check the fuel supply.

COOLING SYSTEM

Inspect the cooling system and add water or anti-freeze as required.

TIPS ON ENGINE CARE

NEW OR REBUILT ENGINES

It is good practice not to operate a new or rebuilt engine at more than ¾ throttle for the first 8 or 10 hours. This low speed will permit the bearings to seat properly, and will allow the operator to familiarize himself with the controls and performance of the engine.

SAE 10-W Engine Oil for API Service "MS", should be used in the engine during the break-in period because the clearance between moving parts is very small and the light oil provides assured lubrication. Keep the oil at the proper level. After 25 hours of operation the crankcase may be drained and refilled with oil as recommended in the Lubrication Section.

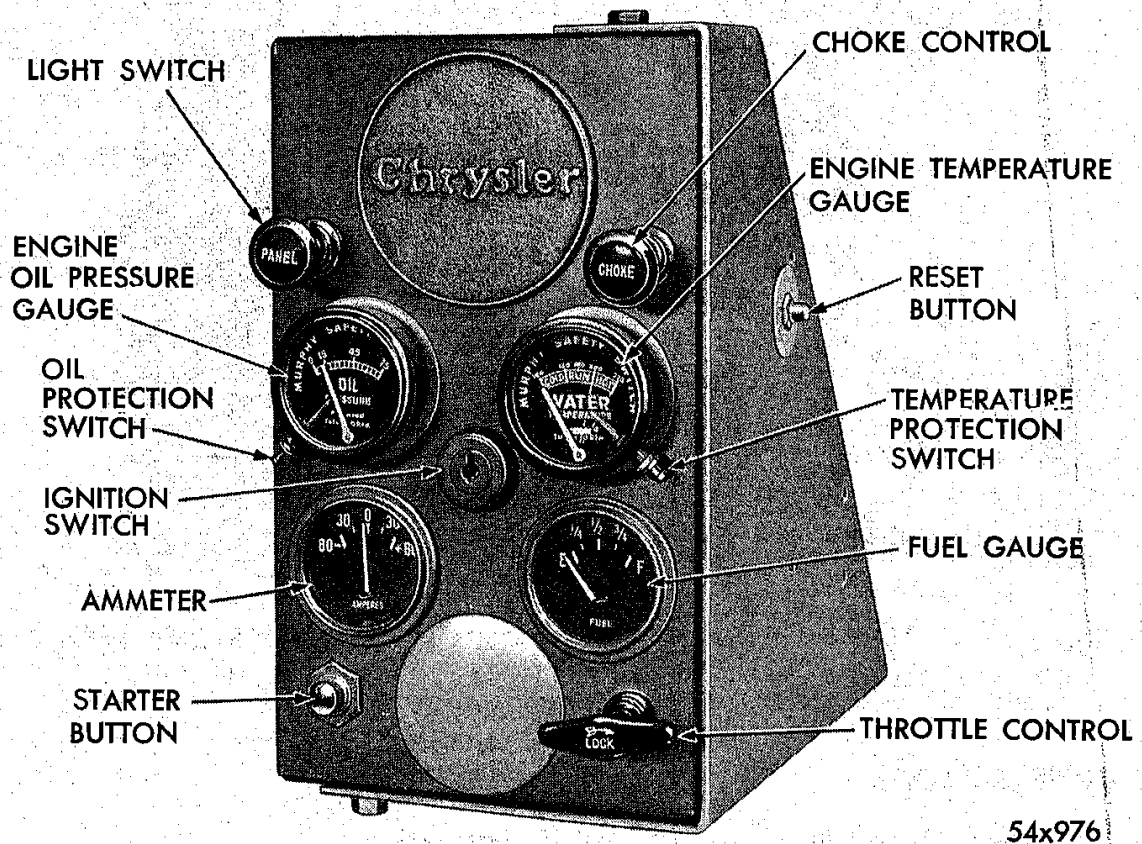


Figure 53 — Engine Mounted Instrument Panel

COLD ENGINES

When starting a cold engine (whether new or not), avoid unnecessary acceleration during the warm-up period. Keep the throttle at little more than idling speed until normal operating temperature is indicated on the temperature gauge. This simple precaution will assure long life of the engine and maximum efficiency of operation.

STARTING AND STOPPING THE ENGINE

STARTING

Open the throttle at ⅓ opening. (Fig. 53) See that the clutch, gear shift lever or power take-off is in neutral position. Turn on the ignition switch and press the starting motor switch until the engine starts. Do not hold the starting motor switch in for periods longer than 15 seconds if the engine does not start promptly. After the engine starts, watch the oil pressure gauge. If the oil pressure gauge does not register after about 10 seconds, stop the engine and investigate.

OIL PRESSURE SAFETY SWITCH

On engines equipped with oil pressure safety switch, the manual starting button on the safety relay must be held in until the engine has started and generated sufficient oil pressure to lock-in the safety relay.

STOPPING

To stop the engine, first close the throttle and disengage the clutch. Allow the engine to run at idle speed for a few minutes, then with the throttle closed, turn off the ignition.

PRECAUTIONS

WARM-UP PERIOD

After starting a cold engine, operate it at a speed only slightly faster than idle (approximately 700 rpm) for a few minutes to allow the engine to reach normal operating temperature before placing it under full load. This warm-up period will permit oil to reach all bearing surfaces, thus reducing the possibility of scoring and premature wear of internal engine parts.

OIL PRESSURE

With the engine turning at approximately 2000 rpm and the water temperature at 160°F., the oil pressure should be from 45 to 65 pounds,

providing there is no abnormal escape of oil from some point. As bearings wear and the increased clearances permit more than the normal escape of oil, there will be a drop in pressure shown on the gauge, particularly at idling speed. A drop in oil pressure may also be the result of a plugged oil filter element (Full-Flow Type Filter).

WATER TEMPERATURE

A thermostat in the cylinder block retards the circulation of liquid in the cooling system until the liquid has reached a predetermined temperature, thereby permitting faster warm-up of the engine. Do not operate the engine with the thermostat removed, as this unit is essential to proper circulation and efficient engine performance. Without the thermostat, sludge will form in the crankcase because the low temperature of the engine permits condensation of fumes in crankcase. The thermostat cannot be repaired; if it fails to operate properly, replace the unit. When installing a thermostat, position it so that the thin bridges which divide the openings, face to the front and rear of engine (Figs. 54 and 55). When operating in hot climates, the maximum reading of the temperature gauge should not exceed 100°F. above the prevailing atmospheric temperature or not to exceed 210°F.

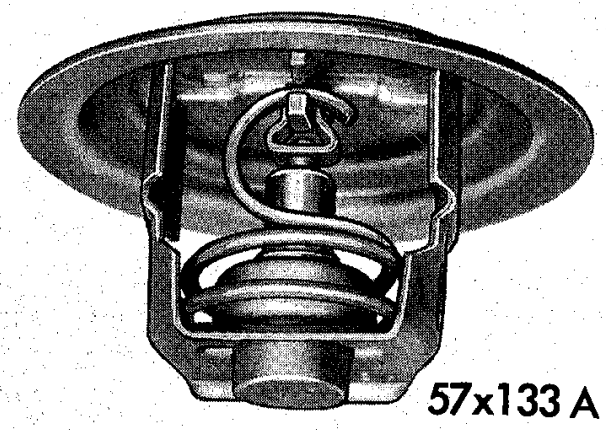


Figure 54 — Pellet Type Thermostat

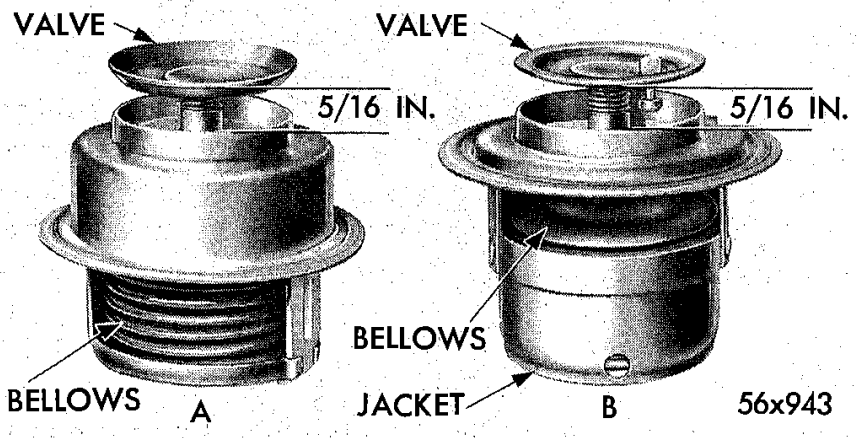


Figure 55 — Bellows Type Thermostat

AIR CLEANERS

Remove and service the carburetor air cleaner, oil filler pipe air cleaner and crankcase ventilator outlet pipe air cleaner, if so equipped, every 50 hours or less, depending on the severity of working conditions. Refer to the lubrication recommendations for servicing the above units.

IGNITION SYSTEM

Keep the units of the ignition system clean and the distributor properly adjusted.

FUEL SYSTEM

Keep the fuel tank, lines and filters clean. Always use a good grade of fuel.

COOLING SYSTEM

Do not fill the cooling system when the engine is overheated. Allow the engine to cool before adding liquid, in order to prevent cracking the cylinder block or cylinder heads. Use a good grade of anti-freeze during cold weather, and MOPAR Rust Resistor during warm weather.

POWER TAKE-OFF AND CLUTCH ASSEMBLY

On units equipped with the Power Take-Off and Clutch Assembly, avoid unnecessary use of the shifting lever. Frequent engagement and disengagement of the clutch causes rapid wear of clutch facings, necessitating frequent adjustment and replacement of parts. Do not attempt to engage or disengage the clutch while the engine is accelerated. Do not operate the unit when the clutch is slipping. See Adjustment Section.

TROUBLE SHOOTING

A good rule to follow when trouble shooting is to make only one adjustment at a time. Locate the cause of failure or irregular operation by the process of elimination.

CAUTION: Before making any electrical tests, air out the engine compartment thoroughly to remove all inflammable fumes.

STARTER WILL NOT TURN ENGINE

Loose or corroded Battery Terminals—Clean terminals and clamps, replace if necessary. Tighten clamps securely. Apply a light film of vaseline to the battery terminals, after the clamps are tightened.

Battery not Fully Charged — Check battery specific gravity. Full

charge reading is 1.260 + or − 0.015. Under 1.210 battery needs recharge.

Attempt to turn engine flywheel with a suitable flywheel turning tool to make sure the engine is free, the engine itself may be seized.

Starter Switch Defective — Replace switch.

Open Circuit in Wiring — Inspect and test all wiring.

Inoperative Starter — Inspect the starting motor for loose brush holders, worn or corroded brushes or corrosion on the commutator. To test the starting motor, disconnect the battery cable at the solenoid switch and touch it firmly to the solenoid starter terminal, now if the starting motor operates, the trouble is not in the starting motor. If the starting motor fails to operate and a heavy arc occurs when the cable touches the solenoid starter terminal, a mechanical lock-up of the motor or pinion, or a grounded condition in the motor may be the cause. Failure of the starting motor to operate and no arc in the preceding test indicates poor brush contact or an open circuit in the motor winding. Repair or replace the starting motor as required.

STARTER TURNS BUT DRIVE PINION DOES NOT ENGAGE

Starter Clutch Slipping — Replace drive.

Broken teeth on Flywheel Drive Gear — Replace flywheel ring gear (see your Chrysler Industrial Engine Dealer).

Armature Shaft Rusted, Dirty or Dry, Due to Lack of Lubrication — Clean, test and lubricate (See your Chrysler Industrial Engine Dealer).

SOLENOID PLUNGER VIBRATES BACK AND FOURTH WHEN STARTER SWITCH IS ENGAGED

Battery Low — Test specific gravity of battery. Recharge or replace battery.

Faulty Wiring — Test for loose connections at starter switch and solenoid; repair as necessary.

Lead or Connections Broken Inside of Solenoid Switch Cover — Test and if necessary replace solenoid.

STARTER OPERATES BUT WILL NOT DISENGAGE WHEN STARTER SWITCH IS RELEASED

Defective Starter Switch — Replace Switch.

Defective Solenoid — Replace solenoid.

STARTER PINION JAMS OR BINDS

Starter Mounting Loose or Misaligned — Check to see that the nuts that hold the starter on the housing studs or attaching screws are tight. Loose attaching parts will cause misalignment of the starter pinion with the flywheel.

Broken or Chipped Teeth on Flywheel Ring Gear — See your Chrysler Industrial Engine Dealer.

STARTER WILL TURN ENGINE BUT ENGINE WILL NOT START

Dirt and Moisture on Ignition Wires and Distributor Cap.

Be sure that the distributor cap and coil is clean especially around the towers. Dirt and grease there can soak up moisture like a sponge, and can easily cause a short. Check for a cracked cap, arcing at the distributor cap contacts, burned rotor. If any cable terminals are corroded be sure to clean or replace them. Clean distributor cap towers inserts. Be sure that the spark plug and coil cable terminals are fully seated and that the nipples fit tightly on the cap towers and around the cables. Replace any cracked or shorted cables.

Dirty or Corroded Distributor Contact Points — Clean points and check for excessive pitting and worn surfaces. If blue oxide is present on contacts, this is an indication that oil or grease has reached the contact surfaces and contacts should be replaced. Remove rotor and wipe all the old grease from surface of breaker cam. Apply a light film of new Mopar Cam Lubricant Number 1473595 on breaker cam only. Do not overlubricate, keep oil and grease away from the breaker points. Install contact points, the contact gap should be .014 to .019 inch, check breaker spring tension — 17 to 20 ounces. See "Adjustments".

Fouled Spark Plugs — Caused by an over-rich carburetor adjustment or excessive oil consumption — oil entering cylinders due to worn rings or worn valve guides. Improper gap adjustment. Clean and dry plugs and set gap at .035 inch. Adjust carburetor.

Ignition Coil Failure — Test and replace if necessary.

Condenser Failure — Test and replace if necessary.

Improper Timing — Refer to "Distributor Timing".

Dirt or Water in the Fuel Line or Carburetor —

Carburetor Flooded — See "Carburetor Adjustments".

Incorrect Float Level Setting — See "Carburetor Adjustments".

Faulty Fuel Pump — See "Fuel Section".

Ignition Coil Failure — Voltage regulator setting too high, refer to specifications and make necessary adjustments. Coil damaged by excessive heat from engine. Replace coil and inspect condition of distributor points. Coil case or tower cracked or leak at coil tower; replace coil. Coil tower may have a carbon track from tower to primary terminal; wipe tower clean and test coil.

FUEL SYSTEM DIFFICULTIES

Fuel Does not Reach Carburetor

Out of fuel: — Tank empty.

Vent pipe in fuel tank clogged.

Shut off valve may be closed.

Fuel Lines restricted.

Fuel Pump Not Operating

Inspect Filter Bowl Gasket — Replace if damaged. Tighten filter bowl retaining screw. (A quick and reliable check for air leaks is to submerge the end of the fuel discharge line in gasoline and check for air bubbles while cranking the engine.)

Inspect for Diaphragm Failure — With engine running, a leaking diaphragm will always result in gasoline leakage at the air vent.

Inspect valves — This requires disassembly of the pump. Failure of the valves is more common than failure at the diaphragm.

Test Fuel Delivery Rate — Disconnect fuel line at carburetor and while cranking the engine with ignition off, discharge the fuel into a suitable container. The amount of gasoline discharged for five pulsations of the pump should be 90 to 100 cubic centimeters (approximately 1/5 pint).

Fuel Reaches Carburetor But Does Not Reach Cylinders

Remove spark plugs and see if they are moist. If there is no trace of gasoline in the cylinders:

The carburetor may be out of adjustment.

The float level may be too low or float valve stuck on the seat.

Carburetor fuel jets or passages clogged with dirt or gum.

Carburetor Flooded

If the spark plugs are wet, this indicates the choke has been used too long or there is an overly rich carburetor mixture. Push the choke button in, open the throttle fully and press the starter button.

GENERAL LUBRICATION

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		DAILY		
Oil Level Indicator	.....	.....	.....	Check oil level daily.
Carburetor Air Cleaner	.....	.....	.....	Check oil daily if engine is operated under extremely dusty conditions. If the sump is found to contain a semi-solid mixture of oil and dirt up to the air cleaner shelf, the air cleaner should be serviced as outlined under every 50 hours of operation.
Power Take-off	.....	Front fitting on side of housing.	Multi Purpose Grease	Daily
		EVERY 25 HOURS		
Distributor	.....	Add 3 to 5 drops to the oiler on side of distributor.	SAE 10W Engine Oil	Every 25 hours.
Governor Linkage	Few Drops	Oil Can	Engine Oil	Every 25 hours.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 25 HOURS (Cont'd)		
Water Pump	.....	1 fitting on some units	Water Pump Grease Only	Every 25 hours. (some engines are equipped with permanent packed bearings and do not require lubrication.)
		EVERY 50 HOURS		
Engine (Oil Pan)	H-318, HB-318 HC-318, H-361, HB-361, HC-361, H-413, HB-413, HC-413, HCI-413, 5 qts. 6 qts if oil filter element is being replaced. HT-361, and HT-413 - 8 qts, 10 qts with single oil filter element, 11 qts with dual oil filter element and oil cooler.	Remove plug in bottom of oil pan to drain oil. Install plug. Add oil through filler pipe to bring to proper level.	Refer to engine oil recommendations.	Every 50 hours. Replace oil if engine is idle 30 days or longer.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 50 HOURS (Cont'd)		
Oil Bath Carburetor Air Cleaner	One quart	Remove cover and filter element, rinse element clean in kerosene and drain. Empty dirty oil from reservoir, clean out the sump and refill to indicated level with fresh oil.	Engine Oil SAE 40 above + 32°F. SAE 20-W below + 32°F.	Every 50 hours. Clean more often if engine is operated under extremely dusty conditions. If SAE 40 Engine Oil is not available, SAE 30 may be used.
Carburetor Paper Air Cleaner	.....	Blow out dirt gently with an air hose. Do not tap or immerse element in liquid.	.....	Replace paper cleaner every 500 hours.
Oil Filler Pipe Air Cleaner	.....	Remove filler pipe cap, wash filter element in kerosene, dry throughly and dip in fresh oil.	Engine Oil SAE 40	Every 50 hours. Clean more often if engine is operated under extremely dusty conditions. If SAE 40 Engine Oil is not available, SAE 30 may be used.
Crankcase Ventilator Outlet Pipe Air Cleaner	.....	Remove filter element and wash element in kerosene. Re-oil with fresh oil.	Engine Oil SAE 40	Every 50 hours. Clean more often if engine is operated under extremely dusty conditions. If SAE 40 Engine Oil is not available, SAE 30 may be used.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 50 HOURS (Cont'd)		
Generator	5 or 10 drops	Oil cup at front and rear bearings.	Engine Oil SAE 10-W	Every 50 hours. After oil is applied, be sure the oil cup covers are closed.
Power Take-off	.....	Rear fitting on side housing and fitting on end of shaft.	Multi Purpose Grease	Every 50 hours.
Clutch Linkage	.....	Oil Can	Engine Oil	Every 50 hours.
Transmission (Manual)	.....	.....	Multi-Purpose Gear Lubricant	Check oil level every 50 hours. Replace oil every 500 hours or 6 months as in last item of this table.
Power Torque		With engine idling, operating temperature normal and transmission in neutral, remove dip stick and check oil level. If oil level is low, add Automatic Transmission Fluid Type "A" Suffix "A" until level reaches the "Full" mark on the dip stick.	Automatic Transmission Fluid Type "A" Suffix "A"	Every 50 hours.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 100 HOURS		
Oil Filter (Full-Flow Type) Replaceable Element Heavy Duty Remote Mounted	..... One quart Two quarts Two quarts	Remove cover, gasket and element. Wipe clean, inside of filter casing and install new MOPAR filter element and gasket. Install cover. Then, idle engine for about five minutes and correct oil level in engine oil pan to compensate for oil absorbed by the filter.	.....	Service filter more often if engine is operated under extremely dusty conditions.
Oil Filter (Screw on, Throw Away Type) Light Duty	..... One quart	Unscrew the filter from the base and discard. Wipe the base clean and screw on a new filter until the gasket on the filter contacts the base. Tighten at least ½ turn more. Run engine to check for leaks. Add oil to full mark on the dip stick.	.....	Operation in dusty areas will require more frequent filter changes.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 100 HOURS (Cont'd)		
Closed Crankcase Ventilator Valve	.....	Remove the valve and long tube, disassemble and wash with a solvent capable of removing gasoline, gums varnishes such as carburetor cleaner. Dry thoroughly and reassemble.	.....	Clean the valve more often if the engine is operated under extremely dusty conditions.
Full Flow Filter By-Pass Filter Dual Oil Filter (413 cu. in. Engine only)	.....	Remove cover, gasket and element on the Full Flow type. The by-pass filter has an orifice with a 1/32 inch hole that should be cleaned with a wire to make sure the orifice is open. Wipe the base in each filter clean and install a new Mopar filter element and gasket for each. Install both covers and idle engine for about five minutes to check for leaks. Add oil to the full mark on the dip stick.	.....	In dusty areas or under severe operating conditions, it is advisable to change the filters more frequently.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 250 HOURS		
Power Torque Drive Unit	*7.2 Quarts *Add one quart if filter element is changed.	Remove the drain plug at the bottom of the hydraulic clutch housing oil pan and drain the fluid. When changing the oil, the engine and the hydraulic clutch housing should be hot, as the oil will drain down into the oil pan more readily, and carry off foreign material and sediment more completely. Drain the Torque Converter by removing the cover from the bottom of the Torque Converter Housing and using a suitable tool turn the flywheel until the converter drain plug is accessible. Tighten both drain plugs after the oil has drained. To refill: remove the vent plug fitting on the opposite side of the hydraulic	Automatic Transmission Fluid Type "A" Suffix "A"	If oil must be added before this time, add Automatic Transmission Fluid Type "A" Suffix "A". Drain every 250 hours or 3 months, whichever comes first or every 150 hours or 2 months whichever comes first, for heavy loading or during warm weather.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 250 HOURS (Cont'd)		
		clutch housing from the dipstick and fill the oil pan with 5 quarts of Automatic Transmission Fluid Type "A", Suffix "A". Start the engine and run at idle speed. After a few minutes of running, add sufficient oil to bring the level up to the full mark on the dip stick. Replace the vent pipe fitting. The oil level should always be checked with the Power Torque drive unit running as part of the oil in the system from the Torque Converter drains back into the oil pan when the engine is stopped.		
Distributor Wick	2 or 3 drops	Remove distributor cap and rotor and oil wick in center of cam.	Engine Oil SAE 10-W	Every 250 hours.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 250 HOURS (Cont'd)		
Distributor Cam	.....	Wipe old grease from surface of the breaker cam and apply a light film of new distributor cam grease.	Mopar Cam Lubricant Part #1473595	Every 250 hours.
		EVERY 500 HOURS		
Loadflite Automatic (A727)	18½ Pints (Dry Fill)	Remove the drain plug from the oil pan. Remove the torque converter access plate, remove the converter drain plug.	Automatic Transmission Fluid Type "A" Suffix "A"	Every 500 hours or 6 months.
Transmission 3-Speed (745) 3-Speed (T87E) 4-Speed (420) 4-Speed (433D) 5-Speed (540)	 3¼ Pints 6 Pints 5½ Pints 9½ Pints 9½ Pints	Remove drain plug in bottom of case to drain lubricant. Install plug. Fill transmission to bottom of filler plug hole at side of case. Above + 90°F. As Low as − 10°F. Below − 10°F.	Multi-Purpose Gear Lubricant or Lubricant designed for API Service GL-4 (MIL-L-2105 A or B or the SAE viscosity number. Use SAE 140 Use SAE 90 Use SAE 80	Every 500 hours or 6 months. If SAE 80 is not available, SAE 90 blended with 20% SAE 10-W Engine Oil may be used.

Name of Unit	Capacity	How Lubricated	Type of Lubricant	When Required
		EVERY 500 HOURS (Cont'd)		
Fuel Filter	.....	Disassemble, clean cartridge holder and replace cartridge. In reassembly tighten securely and run the engine to check for leaks.	.....	.....

LUBRICATION

SELECTION OF LUBRICANT

The type of service for which an engine oil is intended is usually designated by the letters MS, MM, or ML on the container. These are service classifications established by the API (American Petroleum Institute). This system does not replace the SAE (Society of Automotive Engineers) grade number of the oil which indicates the viscosity or consistency of the oil recommended.

For best performance and engine protection, the Chrysler Corporation recommends that the operator select:

1. An oil which conforms to the requirements of API classification "For Service MS".
2. An oil of proper SAE grade number in accordance with the recommendations for the anticipated temperature shown in the following table:

Anticipated Temperature Range	Recommended Viscosity Grade No.	Recommended Multi-Viscosity Oils
Above + 32°F	SAE 30	SAE 20W - 40
As low as + 10°F	SAE 20-W	SAE 10W - 30
As low as − 10°F	SAE 10-W	SAE 10W - 30 SAE 10W - 20
Below − 10°F	SAE 5-W	SAE 5W - 20

Chrysler Corporation does not recommend the use of any lubricant which does not have both an SAE designation and an MS service classification on the container.

BREAK-IN-PERIOD

For industrial engine break-in, a good quality engine oil having API classification "MS" should be used.

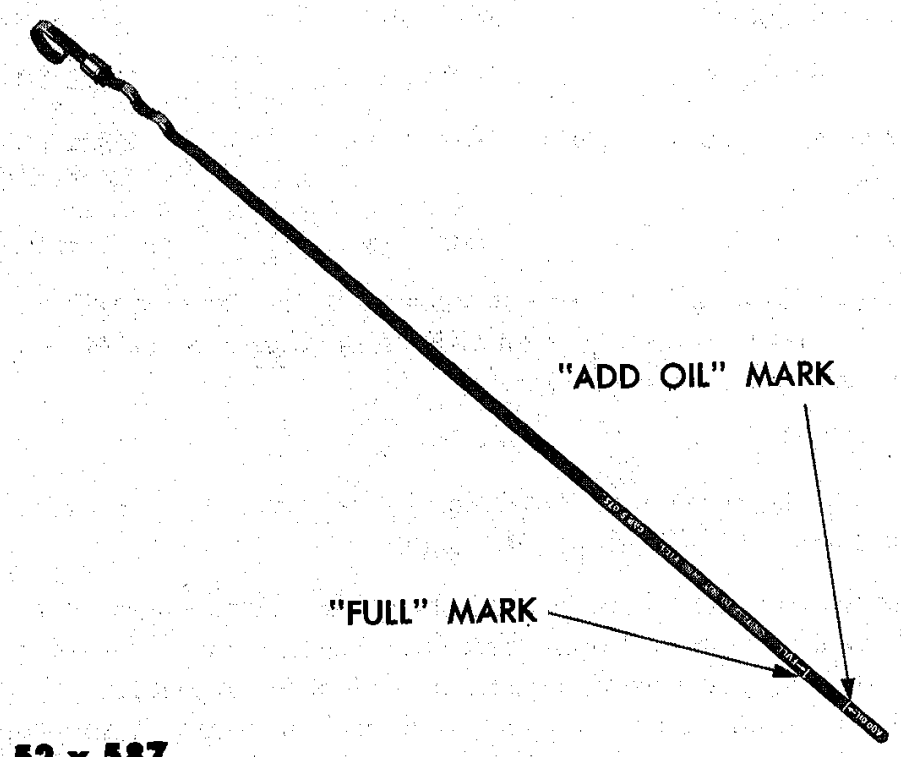
Viscosity of the oil to be used should be based on ambient temperature of the engine operational area. Oil viscosity should be selected from the viscosity-temperature chart under "Selection of Lubricant". After 25 hours of operation, the crankcase oil should be drained, and the crankcase refilled with the correct oil type and SAE viscosity grade.

CHANGING OIL

Frequency of oil change is determined by the type of operation and by operating conditions. Under normal operating conditions, oil should be changed after each 50 hours of operation. High speed, heavy load and extremely dusty conditions necessitate more frequent changes. A comparison of the oil on the indicator with fresh oil will usually serve as a guide. Lack of body, the presence of dirt and grit in the oil indicates that fresh oil is needed. Drain the oil while the engine is hot, as the oil will flow freely and will carrymore dirt and other foreign matter with it. For engine crankcase capacities see "General Lubrication" section of this manual.

ADDING OIL

Between oil changes, check the oil level daily. The oil level indicator (Fig. 56) is of the bayonet type, with two markings, "FULL" and "ADD OIL". After the engine has been standing, the oil level should be at the "FULL" mark. After the engine has started, this level will drop somewhat, due to the filling of oil passages and the oil filter. A quart of oil should be added when the level is at or slightly below the "ADD OIL" mark. Do not run the engine with the oil level below the "ADD OIL" mark.



52 x 587

Figure 56 — Engine Oil Level Indicator

COLD WEATHER OPERATION

During cold weather, examine the oil daily for evidence of sludge or water resulting from condensation of moisture in the crankcase. Under extreme conditions, the engine may not reach normal operating temperature during a short run, with the result that fumes are not dissipated in the crankcase and sludge forms. This sludge may freeze or clog the oil inlet strainer, retarding lubrication of internal parts. If there is evidence of sludge, change the oil. If excessive sludge accumulation is evident, remove the oil pan and clean all accessible parts, including the oil inlet strainer, as thoroughly as possible. Use a new oil pan gasket when assembling the oil pan.

DUSTY CONDITIONS

Operation in dust laden air greatly increases the problem of keeping abrasive materials out of the engine. Under these conditions special attention should be given to the carburetor air cleaner, the filler pipe cap air cleaner, and the crankcase ventilator outlet pipe air cleaner, if so equipped, making sure that they are clean and in serviceable condition at all times. This will reduce the amount of abrasive material that may enter the engine. For operation under extremely dusty conditions the use of a closed or positive crankcase ventilation system making use of a crankcase ventilator flow control valve is recommended.

As a further precaution in preventing excessive wear and possible failure of parts under these dusty conditions, the engine oil and the oil filter cartridge should be changed more frequently. The frequency will depend upon the severity of the dust conditions; therefore, no definite recommendations can be made.

It is always adviseable to drain the crankcase while the engine is at operating temperature. Oil will drain more completely when hot, and will, therefore, carry more of the foreign matter and dirt away with it.

FULL-FLOW OIL FILTER

The full-flow filter cleans the oil as it comes from the oil pump. It is so constructed and installed that it is impossible for the supply of oil to be cut off to the engine even though the filter becomes clogged. If the filter becomes clogged, the oil will not be filtered but will be pumped to the working parts of the engine at reduced pressure through the safety bypass valve in the top of the filter body. When the filter is operating properly, oil pressure indicated on the oil pressure gauge should be 45 to 65 pounds at operating speeds. If this pressure drops to 35 pounds, the filter element may be plugged and should be changed.

The full flow oil filter cartridge should be replaced every 100 hours of operation.

In dusty areas or under severe operating conditions, it is advisable to change the filter cartridge more frequently.

TO REPLACE FULL-FLOW FILTER ELEMENT (FIG. 57)

While the engine is warm remove the filter cover, the cover gasket and the filter element. Wipe the housing clean and install the new filter element. Install a new cover gasket and the cover.

After replacing the filter cartridge, the engine should be operated for a period of five minutes and check made for leaks, the oil level should then be corrected to compensate for the oil absorbed by the new filter cartridge.

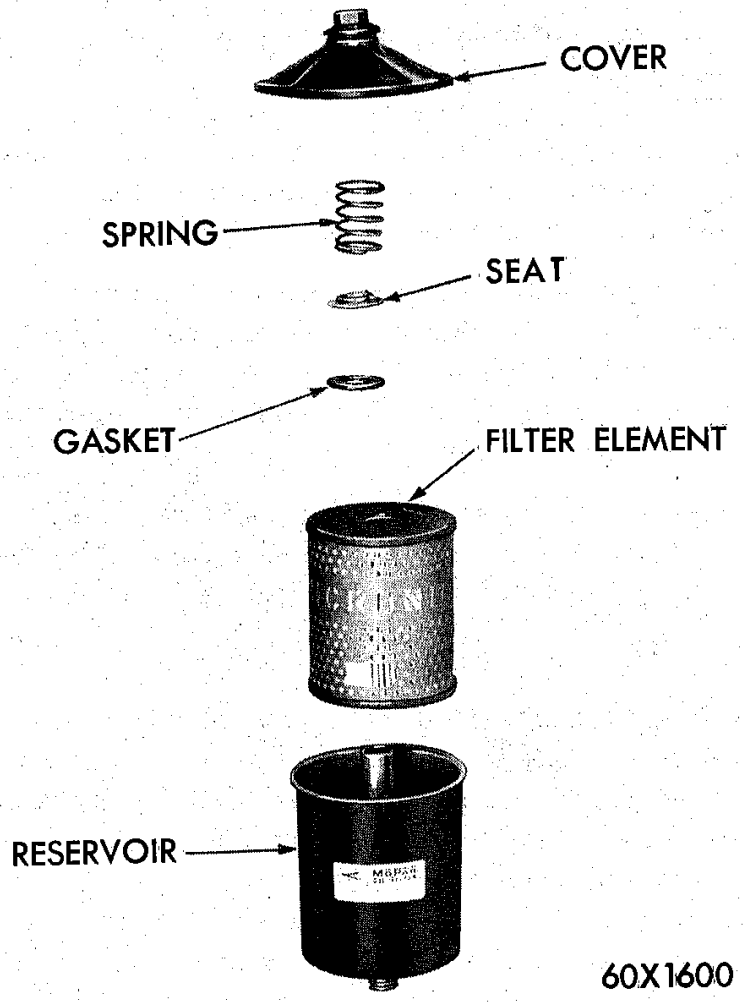


Figure 57 — Oil Filter (Disassembled)

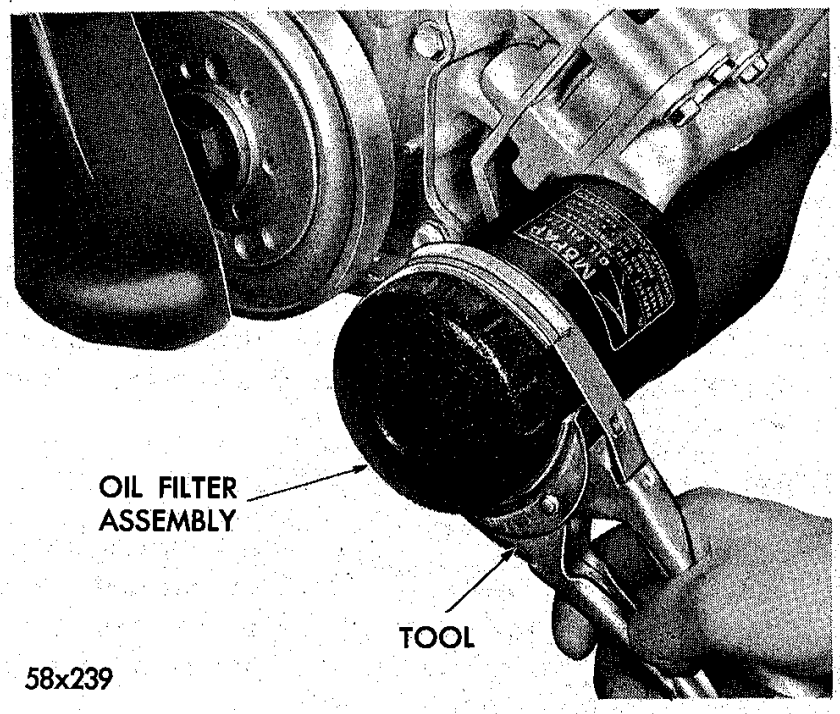


Figure 58 — Engine Oil Filter (Screw-on Type)

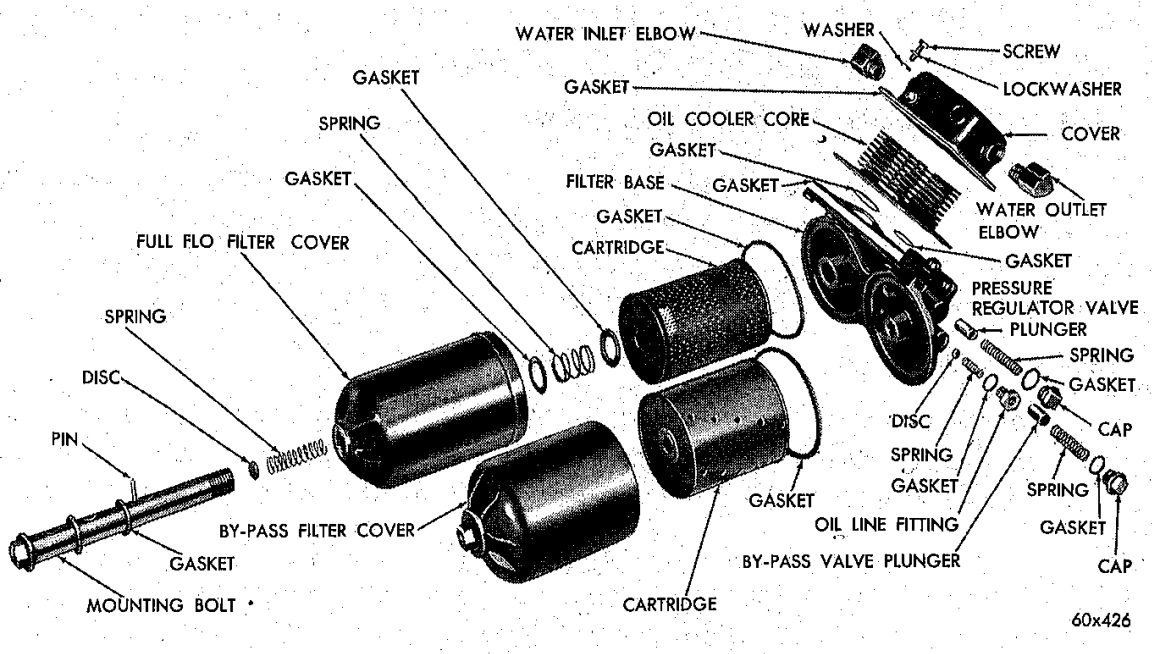


Figure 59 — Dual Oil Filters (Disassembled)

ENGINE OIL FILTER ("SCREW ON" TYPE) (FIG. 58)

On some engines the "Screw on, throw away" full flow sealed filter unit is used. The screw on type oil filter should be replaced every 100 hours of operation.

It is only necessary to unscrew the filter from the base by hand and discard. Wipe the base clean and screw on a new filter until the gasket on filter contacts the base. Tighten at least ½ turn more, as no tools are necessary. Run engine to check for leaks. Add oil to bring level to full mark on the dip stick.

DUAL OIL FILTERS (OPTIONAL EQUIPMENT) (FIG. 59)

Some engines are equipped with dual oil filters, one by-pass type and one full flow type. The by-pass oil filter has an orifice with 1/32 inch diameter hole that should be cleaned with a fine wire to make sure the orifice is open. If the orifice is clogged the filter is not operating.

After replacing the filter cartridge, the engine should be operated for a period of five minutes and a check made for leaks, the oil level should then be corrected to compensate for the oil absorbed by the new filter cartridge.

The dual oil filter cartridges should be replaced every 100 hours of operation.

In dusty areas or under severe operating conditions, it is advisable to change the filter cartridge more frequently.

OIL BATH CARBURETOR AIR CLEANERS

The oil bath carburetor air cleaner (Fig. 60) should be examined weekly or every 25 hours in normal operation. If the quantity of dirt in the sump is sufficient to reach the lower offset in the reservoir, the air cleaner should be removed and thoroughly cleaned.

Every 50 Hours

Remove cover and filter element assembly and rinse in kerosene and drain. Empty the dirty oil from reservoir, clean out the sump and refill to indicated level with the following engine oils.

Above + 32°F.	SAE 40
Below + 32°F.	SAE 20-W

NOTE: If SAE 40 is not available SAE 30 may be used.

Engines operated in dusty territories will require more frequent attention. Under extreme conditions daily service may be necessary.

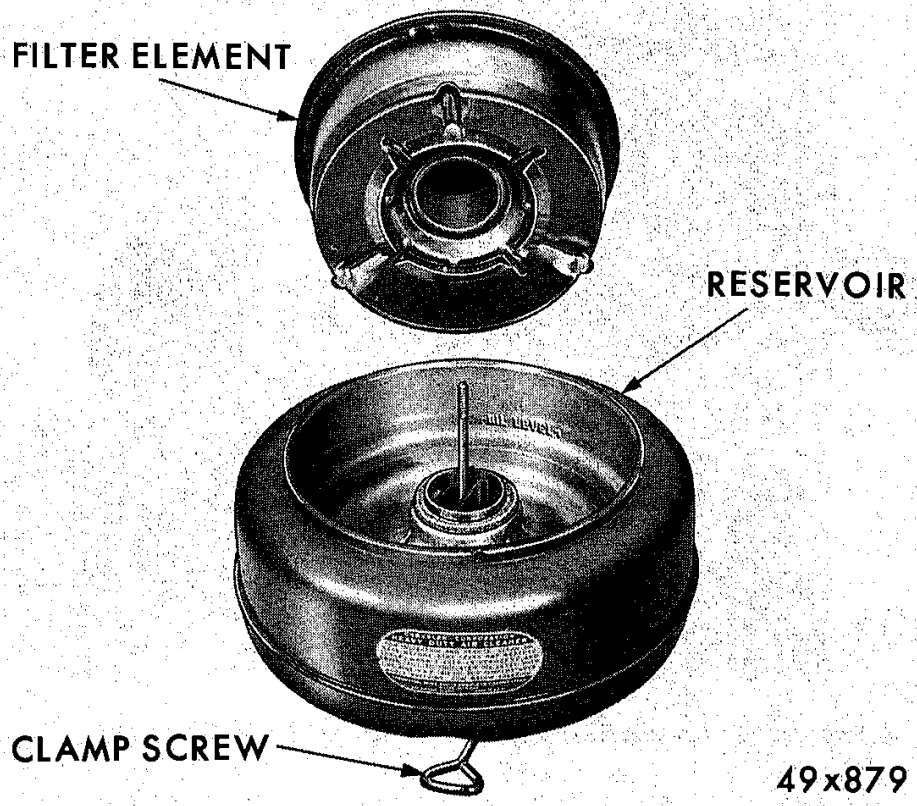


Figure 60 — Oil Bath Carburetor Air Cleaner

CARBURETOR PAPER AIR CLEANERS

Paper carburetor air cleaners should be cleaned every 50 hours or every month in normal use. In areas of extreme dust or dirt, cleaning should be performed more frequently, as often as once a day, if necessary.

To clean the paper element, the following procedure should be used:

Remove cleaner assembly, remove paper element, blow out dirt gently with an air hose. Direct air from inside out, and keep nozzle two (2) inches away from element to avoid damaging. Do not tap or immerse element in liquid. Wash the cleaner cover and body with cleaning solvent, such as kerosene and wipe dry (Fig. 61). Replace paper element, center and secure firmly. Replace cleaner assembly on engine. Replace paper element every 500 hours.

CRANKCASE VENTILATING AIR CLEANERS (OPTIONAL EQUIPMENT)

After each 50 hours of operation, or with each oil change, remove the air cleaner from the oil filler pipe (Fig. 62) and the ventilator outlet pipe (Fig. 63), wash in kerosene, dry and reoil with SAE 40 Engine Oil, or more frequently in dusty conditions.

NOTE: If SAE 40 is not available SAE 30 may be used.

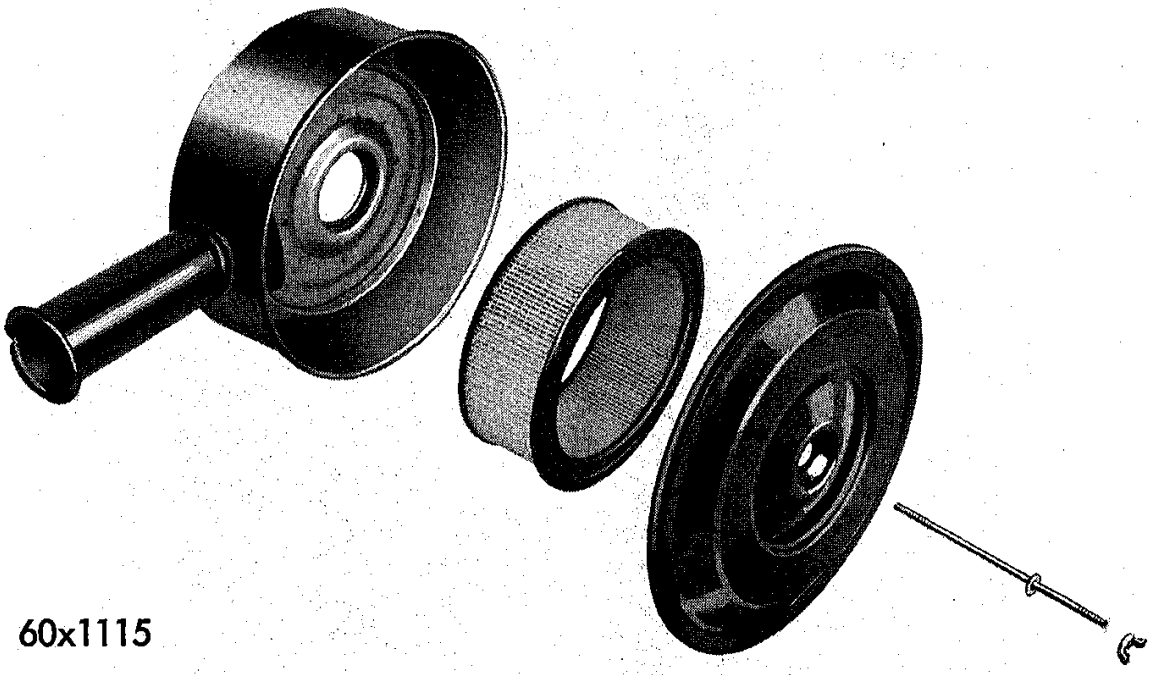


Figure 61 — Carburetor Air Cleaner (Paper Type)

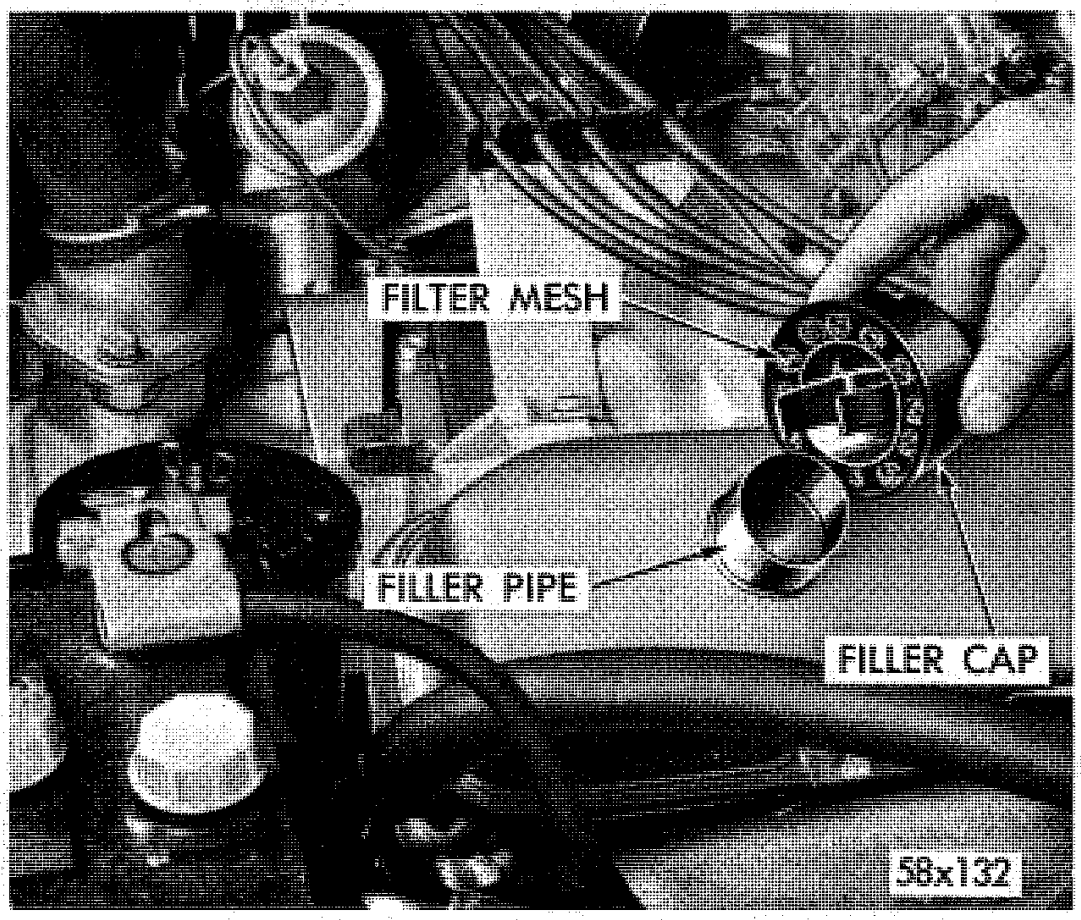


Figure 62 — Engine Ventilation Inlet Air Cleaner

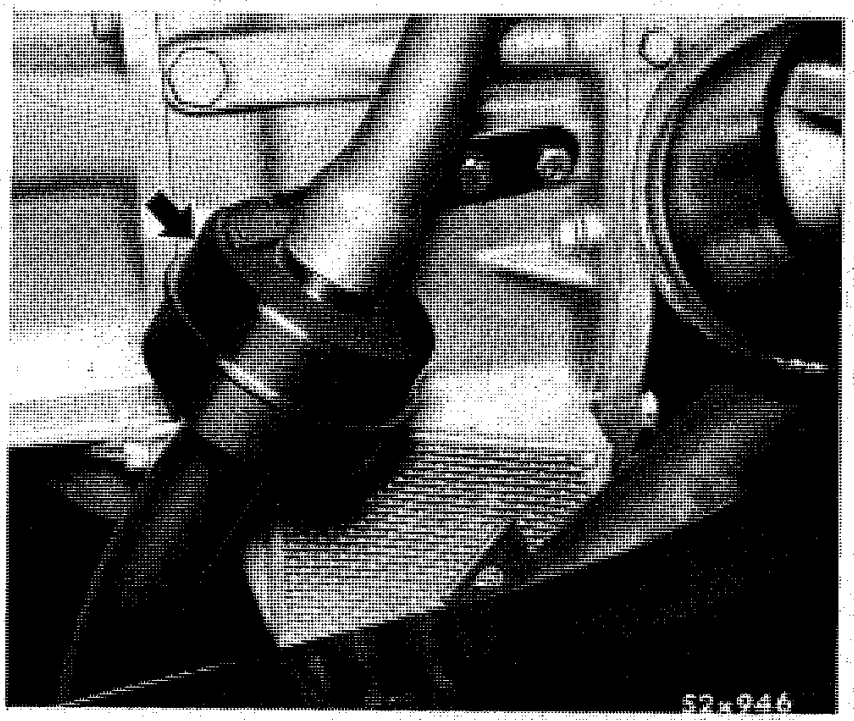


Figure 63 — Crankcase Ventilation Outlet Pipe Air Cleaner

WATER PUMP

Every 25 hours, relubricate using a good quality water pump grease.

The water pumps on Models HT-361 and HT-413 cu. in. engines have one grease fitting. The heavy-duty water pump available on the H-318 engines also has one grease fitting.

All other models have permanently sealed bearings which require no service lubrication.

ALTERNATOR

The alternator bearings are permanently lubricated and do not require lubrication.

DISTRIBUTOR

The distributor (Fig. 64) should be lubricated at three points: (1) Oil cup on the side of the distributor; and (2) Wick under the rotor in the center of the cam. Apply a few drops of SAE 10W Engine Oil to the oil cup after each 25 hours of operation. After 250 hours of operation, remove the distributor cap and rotor and apply two or three drops of SAE 10W Engine Oil to the cam wick; (3) Wipe old grease from surface of the breaker cam. Apply a tight film of new distributor cam grease MoPar Number 1473595.

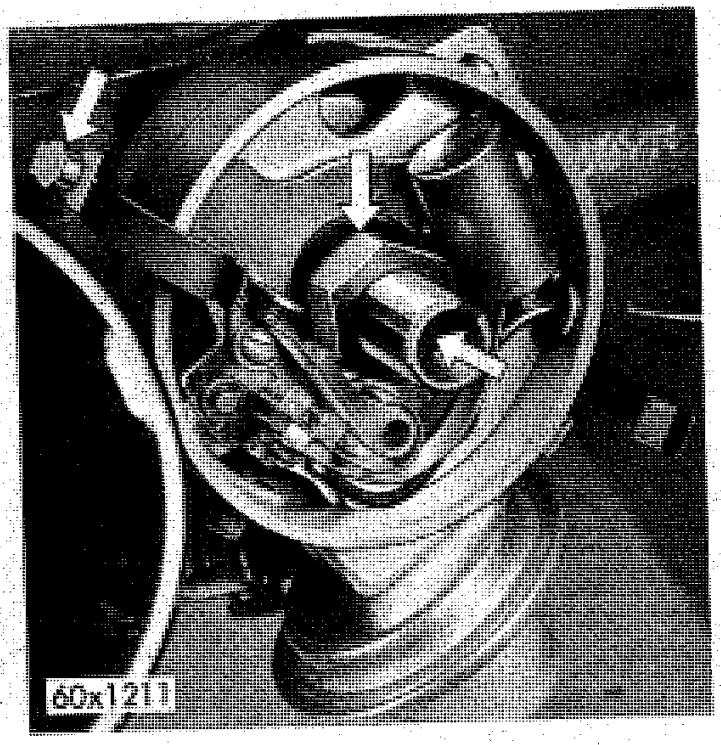


Figure 64 — Distributor Lubrication Points (Typical)

CAUTION: Keep oil and grease away from contact points.

PIERCE MECHANICAL GOVERNOR

This mechanical governor is mounted on the distributor support housing and is gear driven from the distributor. It is lubricated by engine oil through the restrictor elbow in the governor housing. The tachometer cable is driven by nylon gears at the upper end of the governor shaft. The tachometer gears are sealed away from engine oil. And if an overhaul is necessary it should be cleaned and lubricated.

PIERCE BELT DRIVEN MECHANICAL GOVERNOR

The Pierce belt driven mechanical governor is also used on the Models H-318, HB-318 and HC-318 Industrial Engines.

Check the oil level in the governor housing weekly by removing the inspection hole plug at the rear of the housing. The level should be even with the lower edge of the inspection hole. To replenish the oil, remove the filler hole plug at the top of the housing and fill with engine oil until oil reaches the correct level. Use oil of the same viscosity as that in the engine crankcase.

FUEL FILTER

The fuel filter located between the fuel pump and the carburetor on all models contains a paper element, replaceable type.

Every 500 hours disassemble, clean cartridge holder and replace cartridge. In reassembly tighten securely and run the engine to check for leaks.

3-SPEED, 4-SPEED, 5-SPEED TRANSMISSIONS

Remove the filler plug and inspect the level of the lubricant after each 50 hours of operation. (Fig. 65) Level should be at bottom of the filler plug opening. Replenish, if necessary, with Multi-Purpose Gear Lubricant or Lubricant designed for API Service GL-4 (MIL-L-2105) A or B or the SAE viscosity number.

Above + 90°F.	Use SAE 140
As Low as − 10°F.	Use SAE 90
Below − 10°F.	Use SAE 80

If SAE 80 is not available, SAE 90 blended with 20% SAE 10-W Engine Oil may be used. Drain and refill the transmission prior to anticipated temperature change or after each 500 hours of operation. See "General Lubrication" for all Transmission capacities.

POWER TAKE-OFF WITH HEAVY DUTY CLUTCH

Five lubrication fittings are provided for this assembly (Fig. 66), one or two on the side of the housing and one at the end of the shaft,

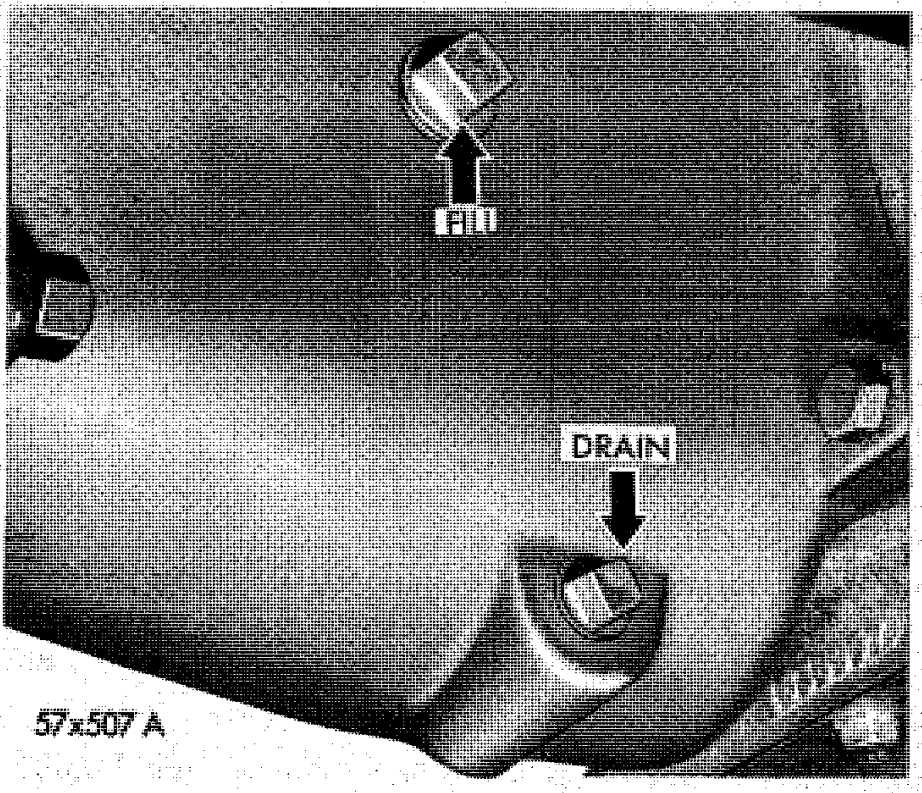


Figure 65 — Transmission Fill and Drain Points (Typical)

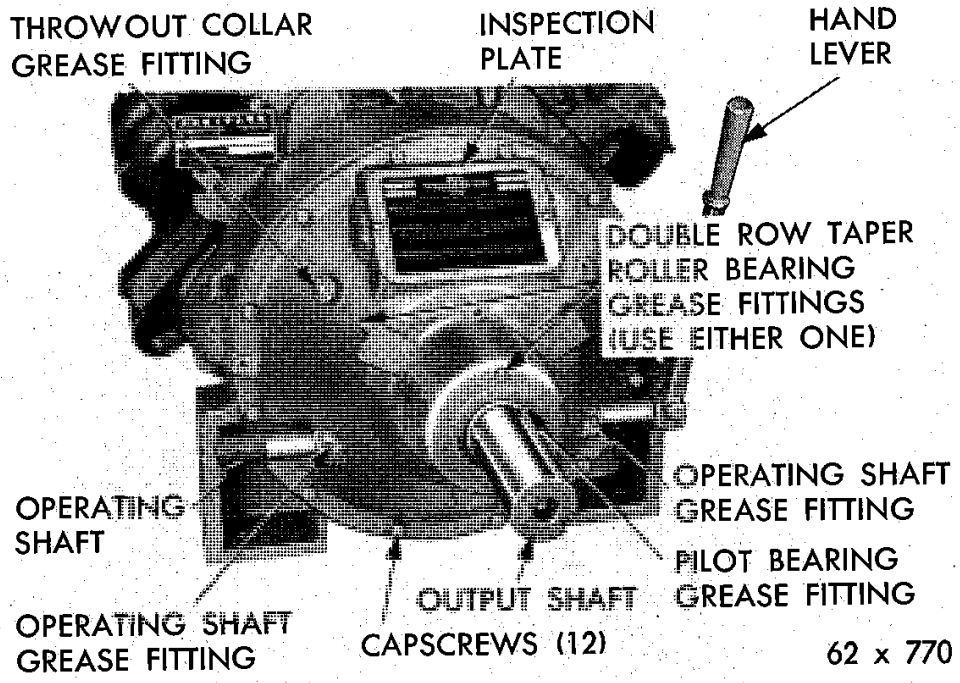


Figure 66 — Power Take-Off Lubrication

and one located on each yoke shaft boss. On some units, the fitting for the clutch release is inside the housing, accessible by removing a small plate at the left side of the housing.

The clutch release throwout bearing should be lubricated through the front grease fitting at the clutch housing, or through the fitting located inside of the housing with multi-purpose grease after every 8 hours of operation. Lubricate sparingly to avoid grease on the clutch facing.

For some types of installation, the pilot bearing must be lubricated from the side of the housing rather than the end. In such case, remove the small plug from the shaft, install a grease fitting in its place and use Multi-Purpose Grease. Remove the fitting from the end of the shaft after lubrication and replace with the plug.

The drive shaft main bearing and the pilot bearing should be lubricated through the grease fitting on the housing with Multi-Purpose Grease every 50 hours of operation.

CAUTION: Do not overgrease.

The clutch levers and linkage should be lubricated with engine oil every 500 hours of operation. Remove the inspection hole cover on the clutch housing and lubricate the toggle joints with engine oil to help keep the joints free.

Lubrication of the yoke shaft is as needed, with multi-purpose grease.

POWER TORQUE (Every 250 Hours) (FIG. 50)

Change the oil in the Power Torque unit every 250 hours or 3 months of operation, whichever occurs first for normal operation and every 150 hours or 2 months of operation, whichever occurs first, for prolonged heavy loading in hot weather.

The oil pan dip stick is located on the right side of the hydraulic clutch housing with the breather vent cap positioned on the left side.

The hydraulic clutch housing and torque converter have an oil capacity of 7.2 quarts "Full" and Automatic Transmission Fluid Type "A" Suffix "A" is used.

Remove the drain plug at the bottom of the hydraulic clutch housing oil pan and drain the fluid. When changing the oil, the engine and the hydraulic clutch housing should be hot, as the oil will drain down into the oil pan more readily, and carry off foreign material and sediment more completely. Drain the Torque Converter by removing the cover from the bottom of the Torque Converter Housing and using a suitable tool turn the flywheel until the converter drain plug is accessible. Tighten both drain plugs after the oil has drained.

To refill: remove the vent plug fitting on the opposite side of the hydraulic clutch housing from the dip stick and fill the oil pan with 5 quarts of Automatic Transmission Fluid Type "A", Suffix "A". Start the engine and run at idle speed. After a few minutes of running, add sufficient oil to bring the level up to the full mark on the dip stick. Replace the vent pipe fitting. The oil level should always be checked with the Power Torque drive unit running as part of the oil in the system from the Torque Converter drains back into the oil pan when the engine is stopped.

CAUTION: The allowable maximum oil temperature is not to exceed 250°F.

Lubrication is provided the two tapered roller bearings in the extension housing by means of a drilled passage in the output shaft depositing transmission fluid in the extension housing sump. An oil return hole in the back of the power unit hydraulic clutch housing maintains the required oil level in the extension housing so that the bottom of the two roller bearings are continuously rotating in oil.

No special attention on the part of the operator is required to lubricate the right angle power take-off as oil is pumped to the extension housing and the proper oil level is automatically maintained.

MAINTENANCE SCHEDULES

DAILY

(1) Check level of oil in crankcase and add oil if necessary to bring level to "FULL" mark on indicator. See Lubrication Section for oil recommendations.

(2) Check cooling system and add clean water or anti freeze as required.

(3) If the engine is operated under extremely dusty conditions, check the carburetor air cleaner and the two crankcase ventilation air cleaners, is so equipped, for accumulation of oil and dirt and service as required. See Lubrication Section.

(4) If the unit is equipped with a power take-off, lubricate the clutch release bearing.

EVERY 25 HOURS OF OPERATION

Lubricate and service as specified for "Daily" and perform the following additional operations:

(1) Lubricate the water pump (if equipped with grease fitting).

(2) Check the level of the fluid in the Industrial torque converter and power torque hydraulic clutch housing, if unit is so equipped.

(3) Adjust fan and alternator belt.

(4) Add 3 to 5 drops of SAE 10-W oil to the oil cup on the outside of distributor housing.

EVERY 50 HOURS OF OPERATION

In addition to the operations listed under "Daily" and "Every 25 Hours of Operation", perform the following operations:

(1) Drain the engine crankcase and refill with recommended grade of oil. See Lubrication Section.

(2) Clean and service the carburetor oil bath air cleaner and the crankcase ventilation air cleaners, if so equipped, as described in the Lubrication Section.

(3) Lubricate the generator. See Lubrication Section.

(4) Check the lubricant in the transmission.

(5) Lubricate the power take-off drive shaft bearings.

(6) Check the electrolyte level in the battery.

(7) Clean dry paper type air cleaners.

EVERY 100 HOURS OF OPERATION

(1) Replace filter element in oil filter.

(2) Clean crankcase ventilator valve.

EVERY 250 HOURS OF OPERATION

(1) Clean and check adjustment of the distributor contact points. (.014 to .019 inch).

(2) Lubricate distributor cam wick with 3 to 5 drops of SAE 10-W oil.

(3) Check spark plugs for fouling and for proper gap (.035 inch).

(4) Check ignition timing. See Adjustment Section.

(5) Check carburetor adjustment. See Adjustment Section.

(6) Inspect all wiring for loose connections and worn or broken insulation. Clean the battery terminals, and coat terminals and clamps with vaseline.

(7) Clean the engine thoroughly.

(8) Drain and refill power torque hydraulic clutch housing and torque converter.

EVERY 500 HOURS OF OPERATION

(1) Drain and refill transmissions (manual and remote shift).

(2) Drain and refill power torque converter unit.

ADJUSTMENTS

ELECTRICAL SYSTEM

Distributor Contact Points

In order to maintain efficient operation, the contact points in the distributor must be adjusted properly, as follows:

To adjust breaker points, remove the distributor cap and rotor, crank the engine until the rubbing block of the movable contact rests on the

highest point of a cam lobe. Loosen the contact support lock screw just enough to permit the stationary bracket to be moved. Turn the adjusting screw to open or close the point gap. The clearance between the points should be from .014 to .019 inch, as measured with a dial indicator (Fig. 67). Tighten the lock screw after each adjustment and measure the breaker point spring tension with an accurate scale. Hook a spring scale on the breaker arm as close to the breaker point as possible and pull scale gently in a straight line (Fig. 68). Take a reading as the points start to separate. The spring tension should be 17 to 21.5 ounces. If not, loosen the screw which holds the end of the point spring and slide the end of the spring in or out as necessary. Retighten screw and recheck spring tension.

Wipe old grease from the surface of the breaker cam and apply a light film of MOPAR distributor cam lubricant (Part No. 1473595) to the breaker cam. Do not over-lubricate, keep oil and grease away from the contact points.

Spark Plugs

Spark plugs should be kept clean to insure economical engine operation. Every 250 hours of operation; remove the spark plugs and examine the firing ends of the plugs for evidence of oil fouling, gas fouling, burned or over heating conditions. Clean or replace, and reset plug gaps to .035 inch. Always use new gaskets when installing the spark plugs. Tighten plugs to 30 foot-pounds torque.

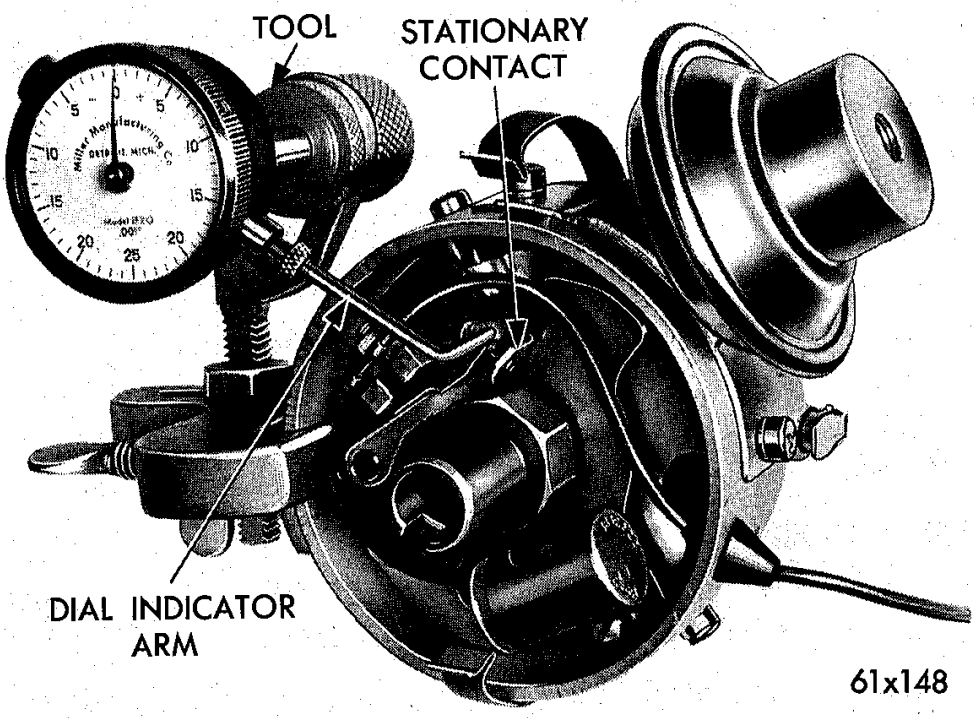


Figure 67 — Checking Point Clearance with Dial Indicator

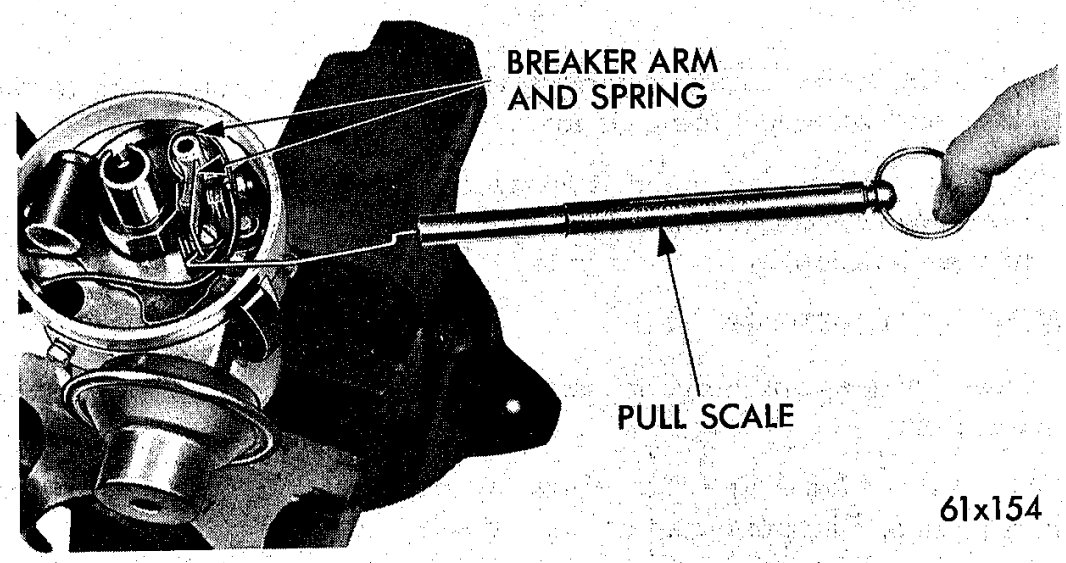


Figure 68 — Testing Breaker Arm Spring Tension

Ignition Timing

To obtain maximum engine performance, the distributor must be correctly positioned to give proper ignition timing as follows:

The ignition timing test will indicate the timing of the spark at the No. 1 piston at idle (only).

Disconnect the vacuum line at the distributor. This will eliminate any chance of vacuum advancing the breaker arm plate. The engine should operate on centrifugal advance only when checking the ignition timing.

Connect the secondary lead of the Power Timing Light to No. 1 spark plug, red primary lead to the positive terminal of the battery and the black lead to the negative battery terminal.

Start the engine and set the idle to 475-500 r.p.m., engine at normal operating temperature (transmission in neutral).

Using a timing light, observe the position of timing mark on the vibration dampener or pulley (units so equipped) end check against the specifications, 10°BTDC for all Models "H", "HB", "HC" and "HT" Series V-8 Engines.

Loosen the distributor clamp screw and rotate the distributor housing so that the specified timing mark and pointer are in alignment. (Moving distributor housing against shaft rotation advances timing and with shaft rotation retards timing).

Tighten the distributor clamp screw securely after the timing has been set and recheck timing adjustment with a Power Timing Light.

When the spark timing is correct, reconnect the vacuum line to the distributor and remove timing light.

NOTE: As the engine speed is increased, the timing mark should move down on the vibration dampener blow the pointer if advance units are functioning.

CARBURETOR ADJUSTMENT

Before attempting any adjustment of the carburetor, check the following items:

(1) **Spark Plugs.** See that plugs are correct type, clean, and have the correct gap. The point gap should be set at .035 inch.

(2) **Distributor Points.** See that points are clean, in good condition and properly set (.014 to .019 inch).

(3) **All High Tension Terminals.** See that terminals are making good contact at plugs and at distributor cap.

(4) **Compression.** See that compression is approximately even in all cylinders.

(5) **Carburetor.** See that carburetor is clean and in good condition and firmly attached to the manifold with no air leaks .

(6) **Manifold Heat Control Valve.** See that manifold heat control valve is free and functioning correctly.

IDLE SPEED ADJUSTMENT WW3-BBD SERIES CARBURETOR

(1) Turn the idle speed screw in or out to obtain 500 rpm. Be sure the choke valve is fully open and that the fast idle adjusting screw is not contacting the fast idle cam (if so equipped).

(2) Turn each idle mixture screw to obtain the highest rpm. While making the adjustment, carefully watch the tachometer and notice that the speed can be decreased by turning the screws in either direction from the setting that gave the highest rpm reading.

(3) Readjust to 500 rpm with the fast idle speed screw.

(4) Turn each idle mixture adjusting screw in the clockwise direction (leaner) until there is a slight drop in rpm. Now, turn each screw out, counterclockwise (richer) just enough to regain the lost rpm.

This procedure will assure that the idle has been set to the leanest mixture possible for smooth idle. **This setting is very important.**

Since the correct speed was originally set using the speed screw, the

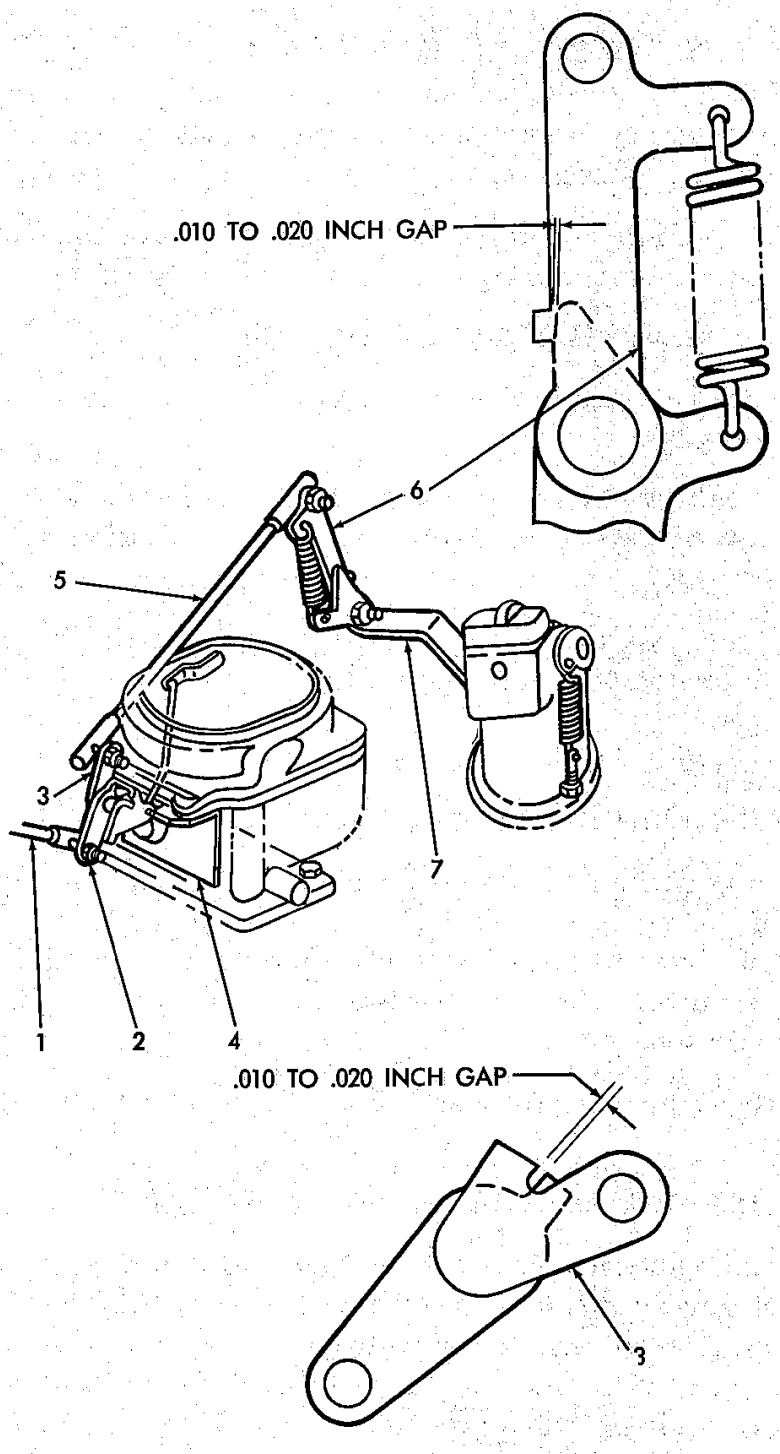


Figure 69 — Pierce Governor Throttle Linkage

1. CARBURETOR ACTUATING ROD
2. CARBURETOR LOWER FLOATING LEVER
3. CARBURETOR UPPER LEVER
4. CARBURETOR STOP (WIDE OPEN THOTTLE STOP)
5. CARBURETOR TO GOVERNOR ROD
6. GOVERNOR AUXILIARY LEVER
7. GOVERNOR LEVER

61 x 424

speed obtained after finding the leanest smooth idle setting will probably be too fast.

(5) Readjust the speed screw to obtain correct idle speed. Repeat steps 2 and 4 above if necessary.

After the proper idle speed has been obtained, move the sliding link to the rear against the stop and tighten the nut securely (if so equipped).

IDLE SPEED ADJUSTMENT AFB SERIES CARBURETOR

The idle speed adjustment is made after the carburetor has been installed on the engine.

With the throttle valves closed and the choke valve wide open (engine at normal operating temperature), adjust the idle screw at 500 rpm.

Adjust the idle mixture screws until the engine operates smoothly, then recheck the tachometer and again adjust the idle screw to give the correct engine rpm.

THROTTLE LINKAGE
ENGINES EQUIPPED WITH THE PIERCE GOVERNOR

The following procedure, based on actual field contact experience, is recommended for correcting so called low power and fuel economy complaints. There are other routine adjustments that should be considered before adjusting the throttle linkage, such as carburetor float setting, proper ignition, etc.

To correctly adjust the throttle linkage, refer to Fig. 69, then proceed as follows:

GOVERNOR/DISTRIBUTOR ADAPTER (PIERCE)

Make certain governor is securely fastened (tight) to block. In general, the best governor arm clearance condition is obtained when the governor and adapter assembly are moved in a clockwise direction (viewed from above the engine), as far as possible before tightening the governor hold-down clamp. This precaution should be observed anytime the governor is installed. This governor hold-down bolt must always be tightened to approximately 10 foot-pounds. (If difficulty is experienced tightening the adapter, replace with clamp, part #1852127, or lengthen leg ¼".)

ADJUSTING THE PIERCE GOVERNOR TO CARBURETOR ROD
(Refer to Figure 70)

(1) Hold the rod so that the carburetor throttle is wide open and

adjust the rod length by turning the ball end so there is .020" clearance between the stops on the governor "broken" lever. (Make sure the throttle is wide open by looking inside the carburetor. Hold the ball joint stud at right angle with the rod so that the proper clearance is maintained when the stud is installed and tightened.) (If on 4-barrel carburetor a bind is encountered, check carburetor to manifold gasket — it can be reversed.) Large holes (secondary) must be to rear.

(2) Attach the rod to the governor making sure that the ball joints at each end of the rod are in line to prevent binding. **Tighten lock nuts on rod.**

(3) Move entire governor arm assembly to the closed throttle position. There should be a minimum of ⅛ inch clearance between the governor arm and bracket. If the clearance is inadequate, remove enough material from the bracket until desired clearance is attained. Allow the governor to return to the wide open throttle position and make sure that there is ¼ inch minimum clearance between the governor arm and air cleaner. (Temporarily install air cleaner.)

(4) Make a final check to insure that there is still .020" clearance between the stops on the governor "broken" lever.

(5) If throttle valves do not stay open, check governor broken arm lever (surge control) spring for distortion. This spring should be completely solid (coil to coil) in the relaxed position and require 9 pounds pull for an extension of ¼ inch.

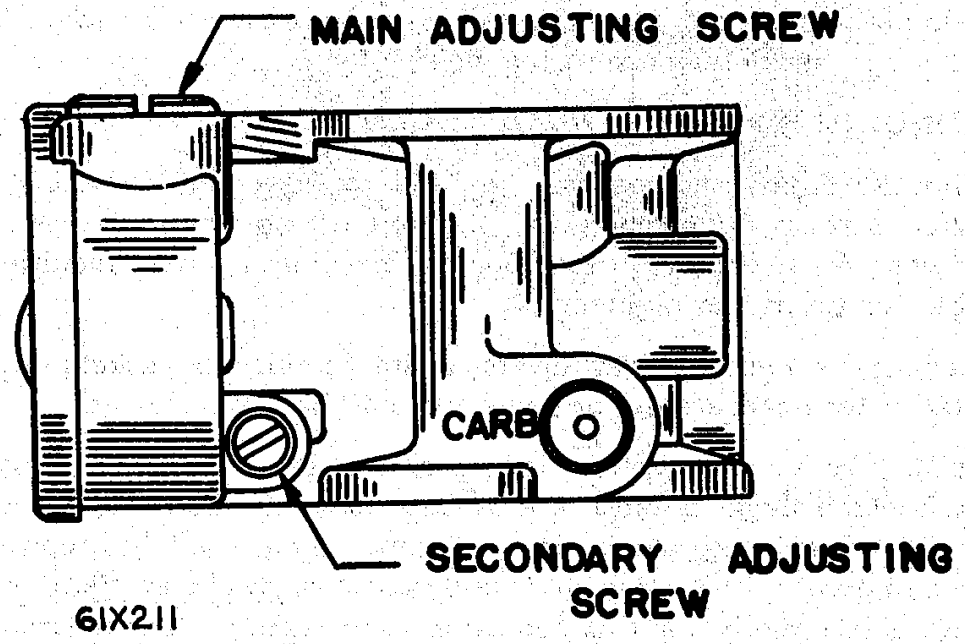


Figure 70 — Hoof Governor Adjustment

ADJUSTING THE HOOF GOVERNOR (Refer to Figure 70)

For higher speed, turn main adjusting screw clockwise; for lower speed, counterclockwise. Always turn governor up to desired speed setting. If setting is too fast, turn back to below desired setting — then up to it.

When desired speed is reached, install seal.

The secondary adjusting screw is factory set to cover a wide range of engine speeds. (This does not apply to governors furnished as original equipment where setting is pre-determined). In setting the governor to desired road or engine speed, use main adjusting screw only. If governor control is too sharp or not sharp enough, follow instructions below. Only in rare instances need the secondary adjustment be changed, as follows:

(1) Drill welch plug covering secondary adjusting screw with a 1/16" drill. Insert a 1/16" rod in drilled hole and pry off welch plug.

(2) IF GOVERNOR CONTROL IS TOO SHARP, WHICH CAUSES SURGING OR HUNTING: Turn secondary adjusting screw clockwise ¼ turn at a time. Turn main adjusting screw counterclockwise approximately one turn for every ¼ turn of secondary screw to bring speed adjustment back to normal.

(3) IF GOVERNOR CONTROL IS NOT SHARP ENOUGH, WHICH CAUSES TOO GREAT A VARIATION IN SPEED BETWEEN LOAD AND NO LOAD: Turn secondary adjusting screw counterclockwise ¼ turn at a time. Turn main adjusting screw clockwise approximately one turn for each ¼ turn of secondary screw to bring speed back to normal. Reinstall the welch plug.

ADJUSTING THE KING SEELEY VELOCITY GOVERNOR

Should the governor become inoperative, or require servicing, or if the correct settings cannot be obtained, the governor should be removed. Replace or take to the local King-Seeley Distributor where facilities are available for proper adjustment.

Leakage of manifold, carburetor, or interconnector gaskets must be corrected before carburetors or governors can be properly set.

It may be apparent after a long period of operation that the governor has become sluggish and is not as responsive as when it was originally installed. Such sluggishness is most generally caused by deposits of carbon and gum on the valve shaft and bearings, stabilizer piston rod or cylinder. The remedy for this condition is to remove the governor and soak it in a cleaning solvent that will remove the carbon and gum de-

posits. It is always recommended that a governor that is not functioning properly be soaked in cleaning solvent before any adjustments or repairs are attempted, because in many cases, satisfactory performance can be restored in this manner. Before attempting any adjustment or recalibration of the governor, run the engine until normal operating temperature is reached. Manifold vacuum at sea level should be at least 16 inches with engine running at full throttle (governor operating), and at least 17 inches at idling speed, with an allowable reduction for altitude.

To adjust governor, refer to Fig. 71, and proceed as follows: For a HIGHER speed, turn adjusting cap (13) counter-clockwise or to the left; for LOWER speeds, turn adjusting cap clockwise or to the right. One turn of the adjusting screw will change the engine speed apprixi-mately 300 rpm.

When a more sensitive regulation is desired, or if the governor is too sensitive and inclined to surge at full throttle, correct as follows by means of the calibrating nut (11).

KING-SEELEY SENSITIVITY ADJUSTMENT

If the governor is too sensitive or has a tendency to surge, place the hollow wrench (1) in position on the calibrating nut (11) and insert the

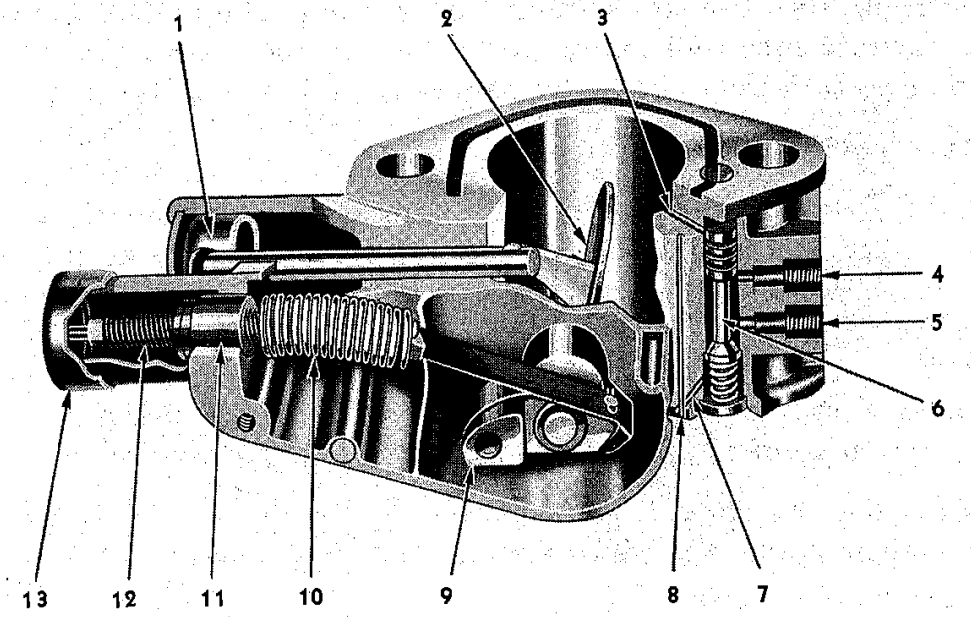


Figure 71 — King Seeley (Handy) Governor (Sectional View)

1 — Non-cheating stabilizer piston
2 — Throttle Valve
3 — Passage to transfer valve chamber
4 — Carburetor vacuum connection (not used)
5 — Ignition distributor vacuum connection (not used
6 — Vacuum transfer valve plunger
7 — Vacuum passage
8 — Vacuum by-pass passage
9 — Cam and valve shaft assembly
10 — Control spring and ribbon assembly
11 — Calibrating nut
12 — Adjusting screw
13 — Adjusting screw cap assembly

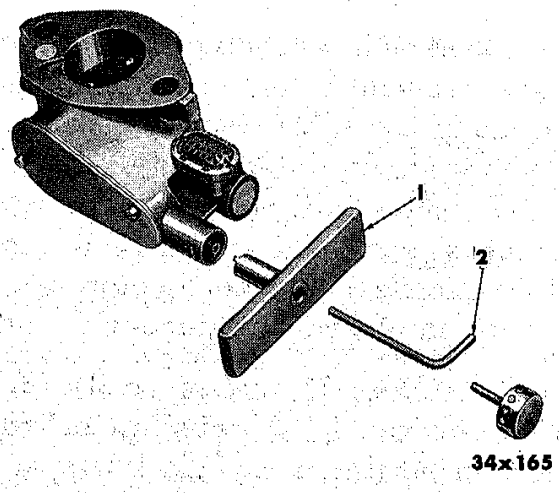


Figure 72 — King Seeley Adjusting Wrenches

1 — Hollow Wrench — A-24283 2 — Hex Wrench — A-25264

special adjusting wrench (2) through the hollow wrench into the adjusting screw and turn the screw clockwise one turn (Fig. 72).

With the hollow wrench in the slot of the calibrating nut, turn the nut clockwise about ¼ of a turn. When this adjustment is made the adjusting screw must be held from turning.

Continue this adjustment until the surge is eliminated. However, engines operate most efficiently when the governor is adjusted to the point which just barely eliminates the surge at full throttle.

KING-SEELEY REACTION ADJUSTMENT

If the governor is slow acting and does not open promptly when a load is applied at the governed speed or cut off promptly at maximum speed, turn the adjusting screw counter-clockwise one turn and while holding the screw in the new position, turn the calibrating nut counter-clockwise ¼ of a turn. Repeat this procedure until the desired regulation is obtained. However, when making this adjustment, it is best to continue until an actual surge is produced, and then, just eliminate the surge.

When the adjustment is completed, tap lightly on the end of the hollow wrench so that the calibrating nut will be properly seated and re-check speed.

The stock numbers of the special wrenches (Fig. 72) are as follows:

A-24283 (Item 1)

A-25264 (Item 2)

These wrenches can be obtained from the King-Seeley Corporation, Ann Arbor, Michigan.

KING-SEELEY CALIBRATION

If the control spring should for any reason be disengaged from the adjusting screw, or the relationship of the adjusting screw and calibrating nut changed by someone not familiar with the governor, it will be necessary to go over the complete calibration for the particular governor to insure efficient control.

Remove seal and adjust screw cap (13. Remove cover screw and force out the drive screw, as indicated on Fig. 73. Do not use a screw driver or similar tool, as it will result in damage to the housing or cover. When the drive screw is out far enough so that side cutting pliers can be applied under the screw head, turn the screw out counter-clockwise.

Position the adjusting screw in the spring until the open coils correspond to the number indicated on the "Calibration Specification" sheets for the particular governor, and it may in some cases be necessary to move the calibrating nut several turns to provide sufficient space between the end of the spring and governor housing to obtain the correct number of open coils.

Referring to Fig. 74, the active coils of the control spring end where the spring contacts the thread of the adjusting screw at point "A". Each

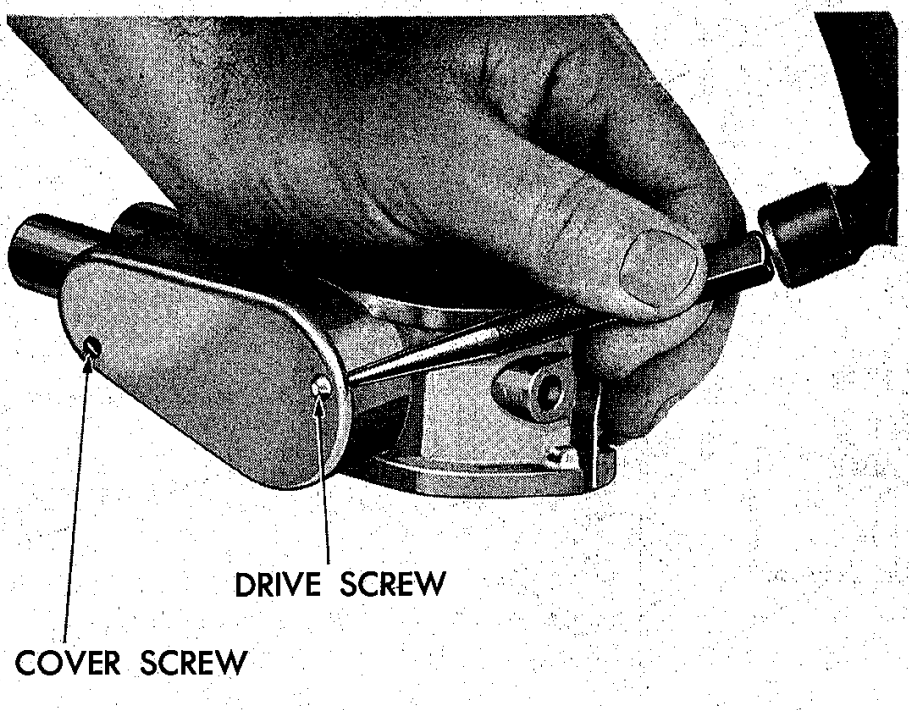


Figure 73 — Removing King Seeley Governor Housing Cover

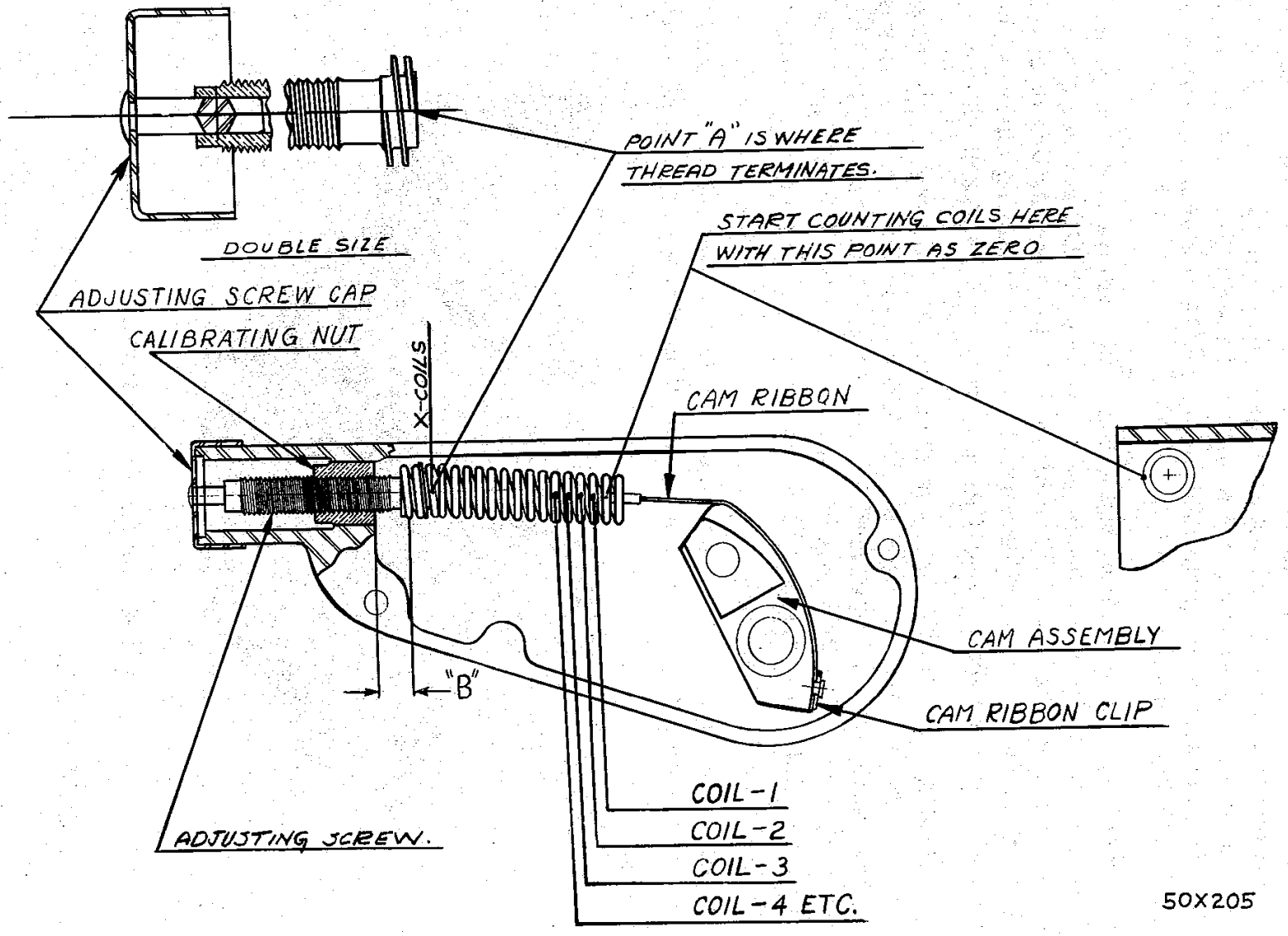


Figure 74 — Control Spring Calibration Detail (King Seeley)

turn of the adjusting screw adds or subtracts one coil. As an example: To obtain 10-¼ coils turn the adjusting screw until there are 10 active coils between zero point and point "A", and then add ¼ coil by turning adjusting screw counter-clockwise ¼ turn.

When the adjusting screw is positioned to provide the correct number of active coils, hold the adjusting screw and turn the calibrating nut in the direction required with the A-24283 wrench until dimension "B" (Fig. 74) indicated on the "Calibration Specification" sheets for the particular governor is provided. This measurement is from the center of the last spring coil to the inside of the governor housing, as indicated on Fig. 74.

This will usually provide a setting within a few hundred revolutions of the maximum governed engine speed recommended for a particular model. However, further adjustment may be required after the governor is installed on the engine to obtain correct control and governed maximum speed. Perform any changes necessary, according to the instructions outlined under the subject of "Adjustments".

Lead type seals are recommended for the governor adjustment, inasmuch as it is possible to lock the lead type seals with a particular symbol which prevents tampering, as any change in the seal would be readily noticeable. While the patented type seals are easier to use, they offer but little protection, inasmuch as they can be easily purchased, enabling the operator or mechanic to change the adjustment and reseal the governor to avoid detection.

Generally, it is not economical to attempt major governor repairs in the average shop, as mechanics are seldom familiar with this type of work. Moreover, it will usually prove less expensive to replace the governor if necessary, or have it reconditioned in an Authorized King-Seeley Governor Service Station.

STARTER PINION ADJUSTMENT

When the starter solenoid is energized to engage the starter pinion, there should be .015 to .030 inch clearance between the pinion and the pinion thrust washer, in order to prevent binding or jamming of the pinion. An accurate measurement of clearance can be made only when the solenoid is holding the pinion in the engaged position. For this reason, do not rely on a measurement made when holding the solenoid plunger in by hand.

PROCEDURE: Remove the starter from the engine. Detach the strap connecting the solenoid to the starting motor terminal. Connect a 12-volt battery to the frame of the starting motor (ground) and to the starter

solenoid battery terminal. Connect a jumper wire from the solenoid relay ground terminal to the starter frame. Connect another jumper wire from the starter switch terminal of the relay to the solenoid battery terminal (this wire energizes the solenoid). Push the solenoid plunger into the engages position; the energized solenoid will hold the plunger in position. Measure the clearance between the pinion and the pinion thrust washer. If the clearance is not within the specified limits (.015 to .030 inch), remove the cotter pin and link pin that attaches the pinion yoke to the solenoid plunger and turn the plunger stud in or out the required distance to provide proper clearance.

FAN AND ALTERNATOR BELT ADJUSTMENT

Fan belts that are adjusted too tightly will cause rapid wear of the alternator bearing and the water pump bearing. A loose fan belt will slip and wear excessively, causing overheating and unsteady alternator output.

(1) To obtain a satisfactory belt adjustment loosen the alternator mounting bolts and the adjusting strap bolt.

(2) Tighten the belt by pulling the alternator out and away from the engine. If properly adjusted, the belt can be depressed 3/8" from a straight line between the two pulleys.

(3) Tighten the alternator adjusting strap bolt and the mounting bolts.

POWER TAKE-OFF, WITH HEAVY DUTY CLUTCH

The clutch must be properly adjusted to prevent slippage, which causes rapid wear of the clutch facings and distortion of the plates. Frequency of adjustment is determined by the amount and nature of the load. Heavy or shock loads necessitate frequent clutch adjustment to compensate for wear.

ADJUSTING THE CLUTCH RELEASE LEVER

Place the shifting lever in released position and remove the adjustment cover from the housing. See Fig. 40. Release the adjustment nut lock and with a long screwdriver or rod inserted in a notch in the nut, turn the nut in a clockwise direction until firm pressure is required to engage the clutch. To keep the clutch from turning with the adjusting nut, apply pressure on the shifting lever while turning the nut. Make sure the lock engages to hold the adjustment.

ALIGNMENT OF CLUTCH HOUSING (IF SO EQUIPPED)

Replacement of clutch housing or reinstalling the original clutch housing (if removed for any reason), must be correctly aligned when

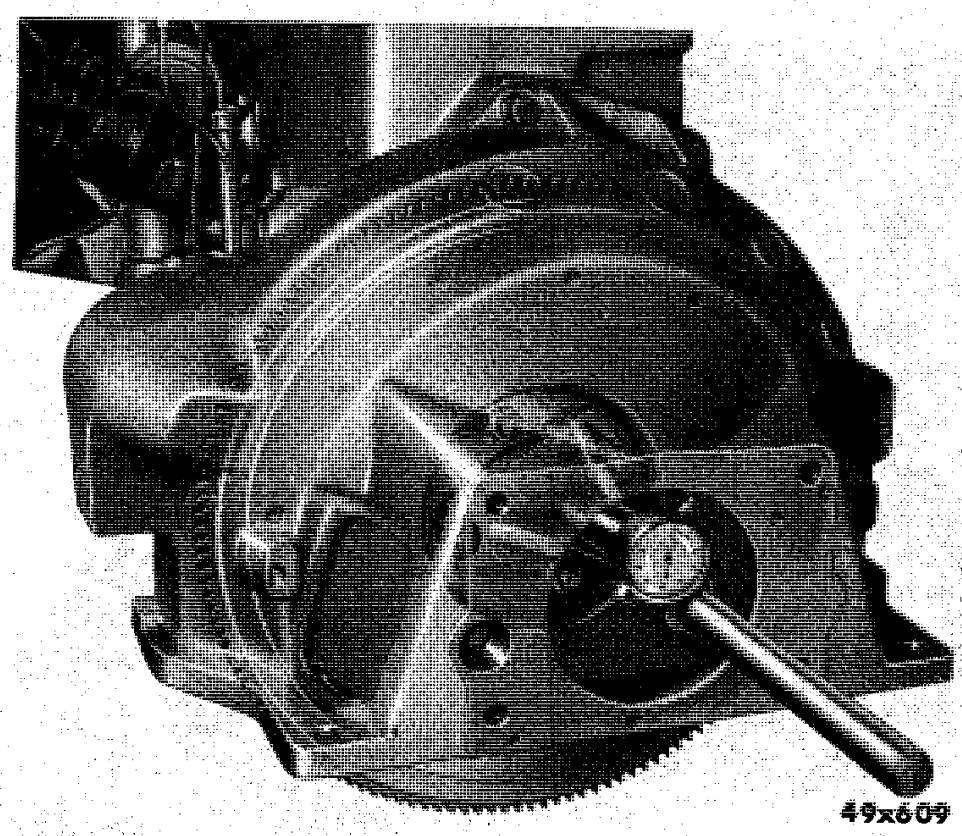


Figure 75 — Flywheel Housing with Tool C-870 Attached

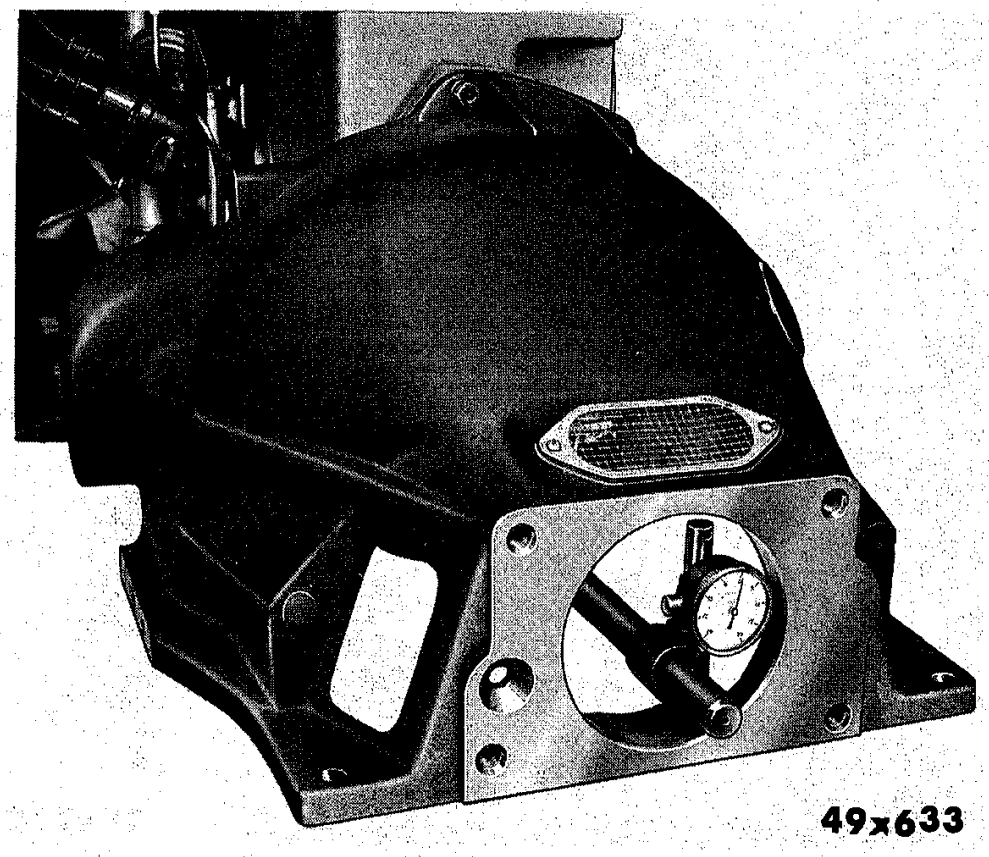


Figure 76 — Checking Clutch Housing Using Tool C-435 (Typical)

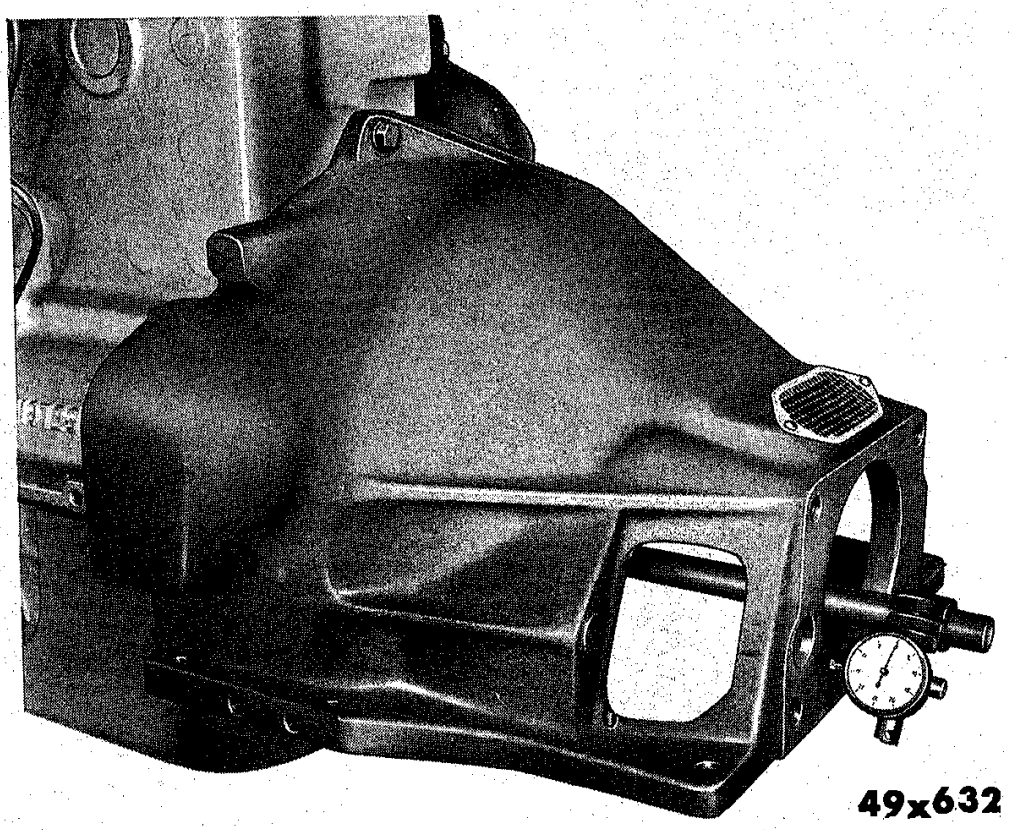


Figure 77 — Checking Rear Face Housing Using Tool C-435

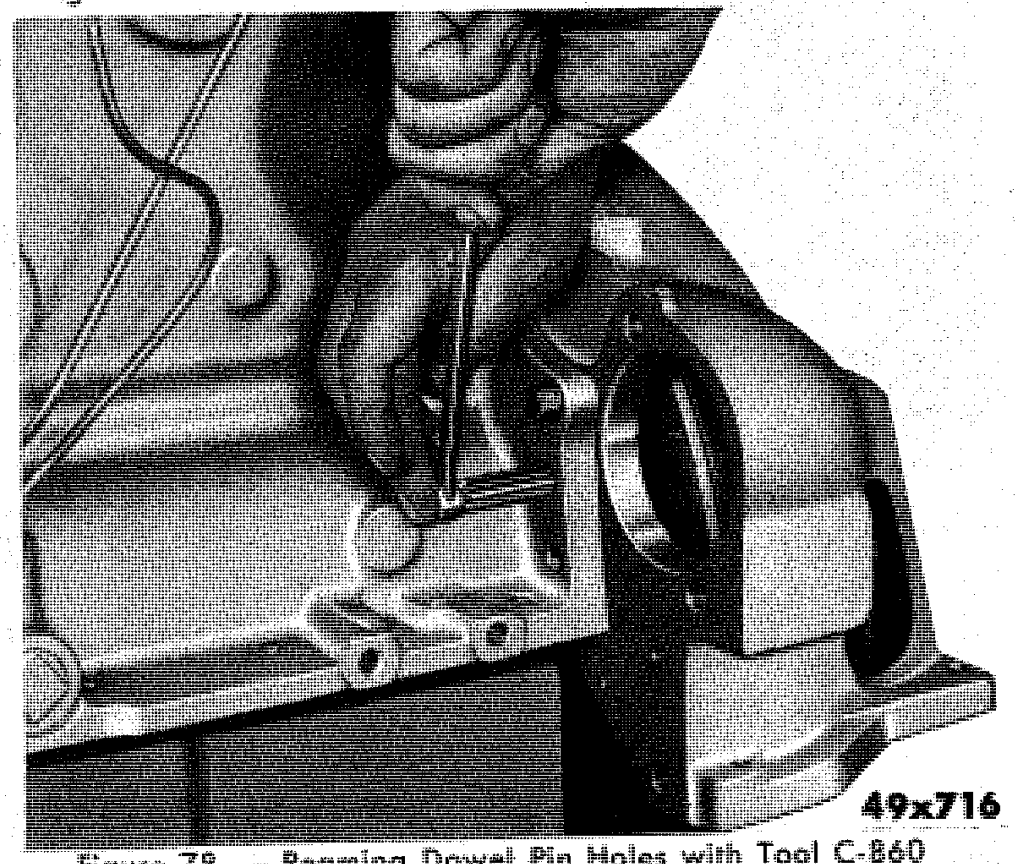


Figure 78 — Reaming Dowel Pin Holes with Tool C-860

installed. Out-of-round of the bore must not exceed .005 inch total indicator reading. To correctly align clutch housing with or without fluid drive, proceed as follows:

(1) Inspect the housing face where it contacts the rear of the engine block for particles of dirt and burrs; remove burrs with a file, then clean both surfaces.

(2) Start the two dowel pins in the block from the front end so they protrude beyond the machined face of the engine block and install the clutch housing. Install clutch housing to block cap screws, making them just snug enough so the housing can be shifted if necessary by tapping with a mallet.

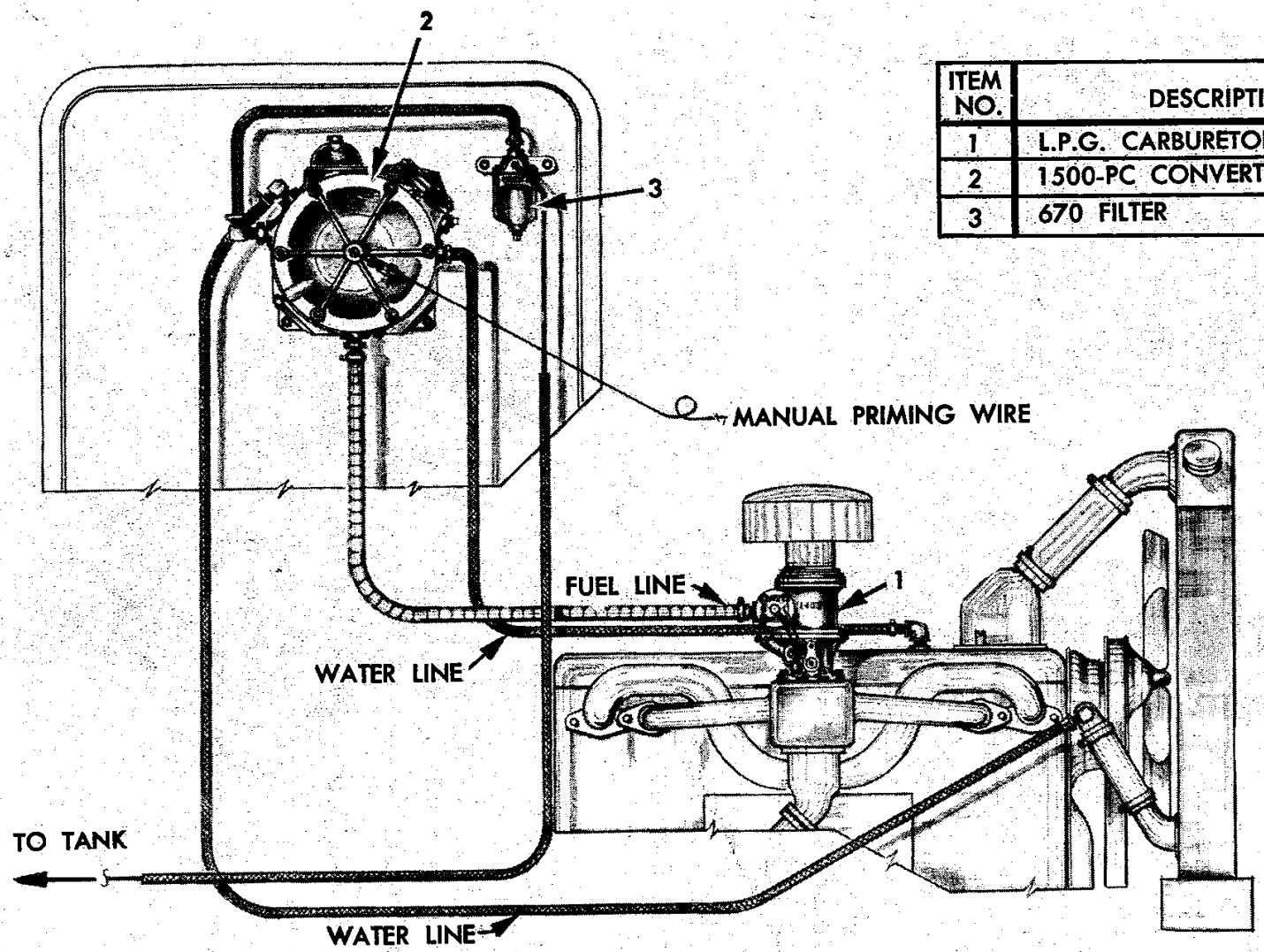
(3) Install the fixture C-870 to the flywheel attaching bolts, (Fig. 75) or, if fluid drive unit is to be installed, attach the fixture to the crankshaft flange bolts and install the indicator (C-435 or C-430) as shown in Fig. 76. Rotate the crankshaft and check the inside diameter of the housing bore; it should not vary more than .005 inch to one complete revolution of the crankshaft. If alignment is necessary, remove the dowel pins and tap the housing until it comes within the specified tolerance. After obtaining correct alignment, tighten the housing cap screws to 30 to 35 foot-pounds torque.

(4) Change the position of the dial indicator and check the rear face of the housing, as shown in Fig. 77. This tolerance must be within .002 inch. Assuming that all burrs and dirt has been removed as described in step 1, this tolerance will no doubt be within the specified limits.

If alignment of the housing was necessary as described in step 3, the dowel pin holes will have to be reamed. Ream with Tool C-860 as shown in Fig. 78 and install .512 inch oversize dowel pins. Continue to assemble the clutch assembly. **Failure to align clutch housing may result in hard shifting of transmission and the possibility of gear disengagement.**

Power Take-Off Heavy Duty Clutch

A hand-hole of ample size is provided to permit convenient adjustment of the clutch. Instructions for adjustments and lubrication are shown on the hand-hole cover plate.



ITEM NO.	DESCRIPTION
1	L.P.G. CARBURETOR "ALGAS"
2	1500-PC CONVERTER
3	670 FILTER

Figure 79 — Liquid Propane Gas System (Typical)

LIQUID PROPANE GAS

LIQUID PROPANE GAS OPERATION

Liquid Propane Gas is a high quality petroleum product which can be stored in liquid form under pressure, but will boil or become vapor at normal atmospheric temperatures. Although Liquid Propane gas is a liquid in the tank it can readily be converted to a vapor when entering the carburetor. The Liquid Propane gas system (Fig. 79), is composed of three main units, carburetor, converter and filter.

a. **The carburetor** is of venturi principle and so designed to mix Liquid Propane gas vapor fuel and air in the correct proportions for best engine operating efficiency at all engine speeds.

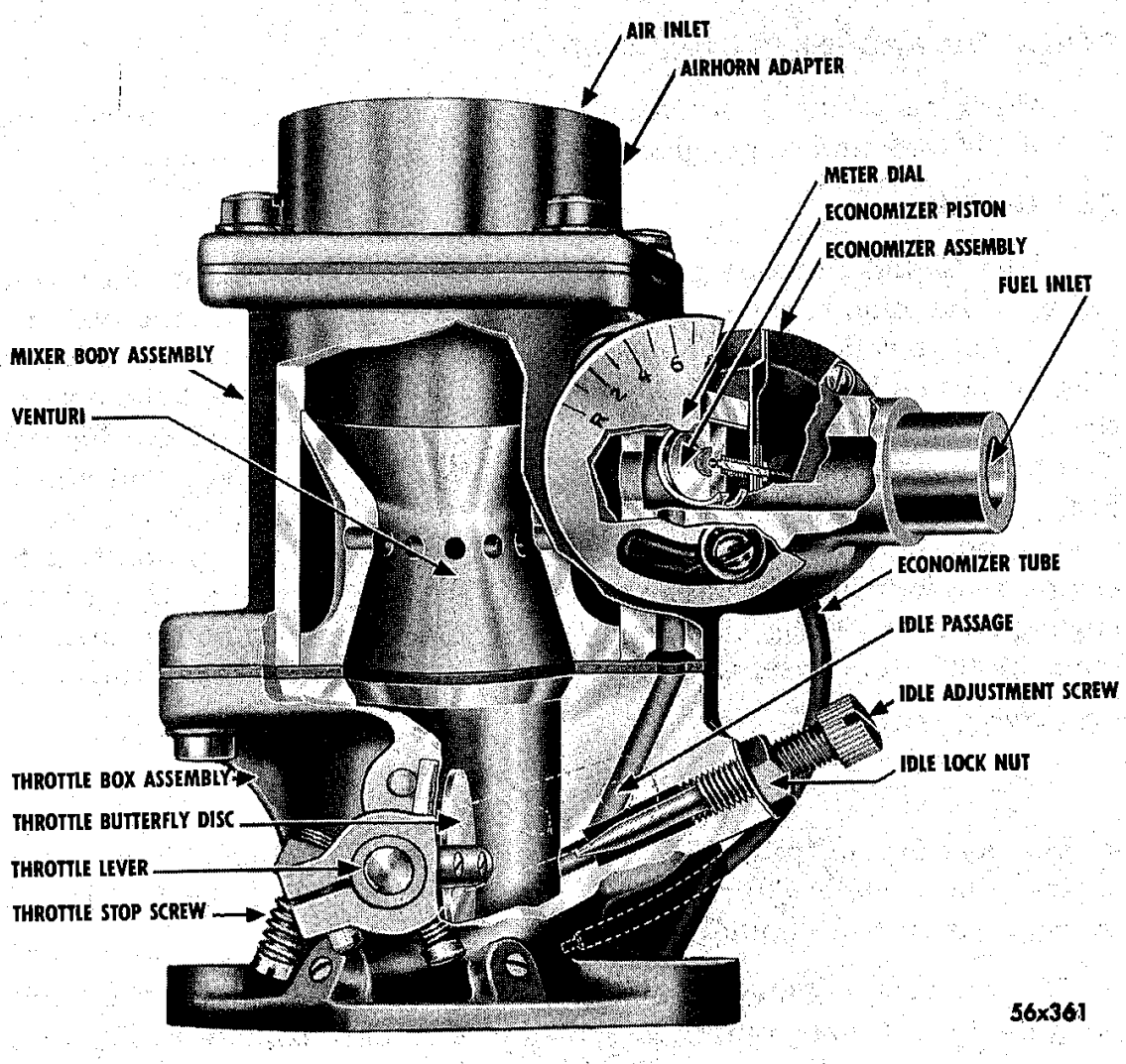


Figure 80 — Liquid Propane Gas Carburetor

b. **The converter** is a combination heat exchanger and pressure reducing unit. The converter receives the liquid fuel under tank pressure, converts it to vapor form, reduces pressure to slightly below atmospheric, and regulates the flow of vapor in volume to meet the engine's demand.

c. **The filter's** function is to catch foreign particles of dirt that may be in the tank and fuel line.

d. **To start engine,** open throttle **all the way.** Depress plunger on the propane vaporizer for a short period of time and close the throttle to one-fourth open position. Depress magnetic oil safety switch (if so equipped) and start the engine. Continue to depress safety switch button until oil pressure reaches 40 pounds. When weather is extremely cold, it may be necessary to "choke" the engine occasionally by depressing button on the vaporizer. Warm up the engine at approximately 1400 rpm before putting on the load.

OPERATING AND SERVICE INSTRUCTIONS

When removing or servicing converter or filter, be sure to shut off fuel at the tank and run engine until all fuel is out of the lines.

CARBURETOR

The Liquid Propane gas carburetor (Fig. 80) replaces and serves the same function as the gasoline carburetor in that it mixes the fuel and air in proper ratio for economical operation under all load conditions. The idle, or no load, adjustment consists of a needle valve at the base of the throttle box, the setting being held by a locknut, as shown in Fig. 80. The power adjustment is made by rotating the meter tube dial and is firmly set by a lockscrew. This provides the fuel setting for maximum power and rpm. The economizer varies the fuel input in proportion to engine requirements during part throttle or irregular operation of the engine, such as during cruising or deceleration periods. Adjustment is made by the economizer screw on the opposite side of the meter tube dial.

CONVERTER (Fig. 81)

The converter is composed of three parts, as follows:

a. The heat exchanger portion is connected to the cooling system of the engine. The converter furnishes the heat for vaporizing the fuel in the transformation from liquid to vapor.

b. The primary regulator reduces the liquid fuel from existing tank pressure to a lower controllable pressure of approximately 5½ to 7 pounds.

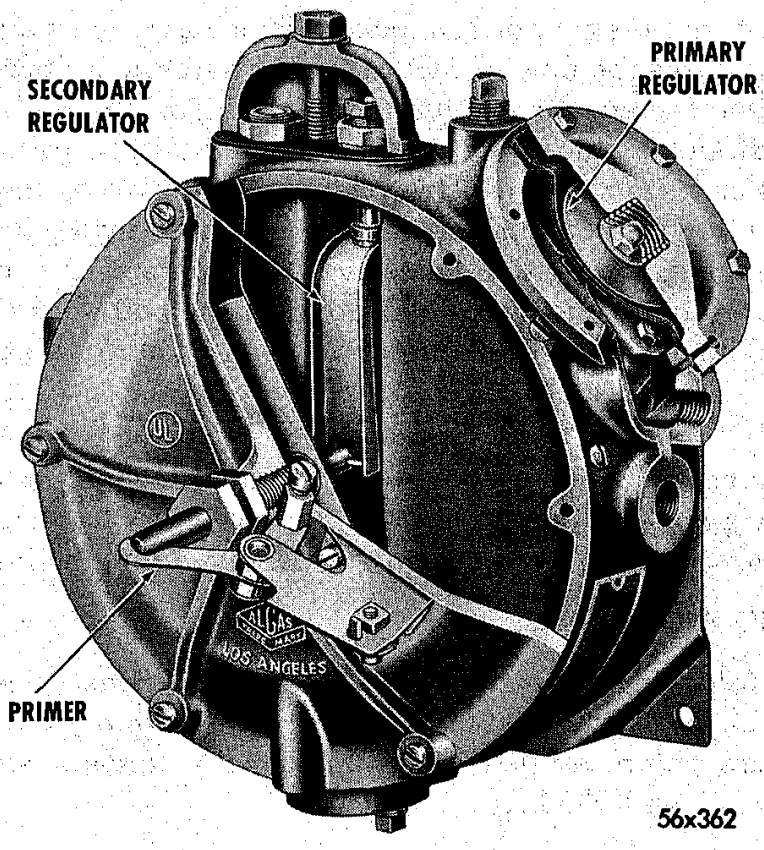


Figure 81 — Liquid Propane Gas Converter

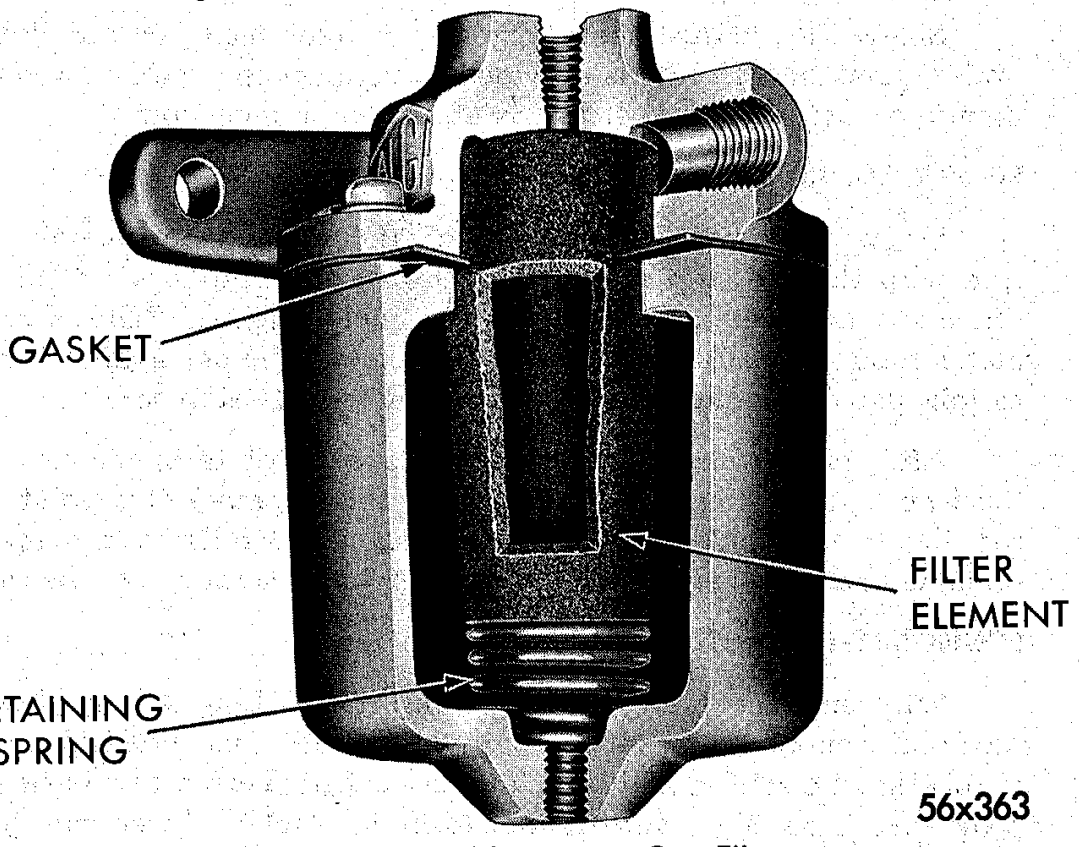


Figure 82 — Liquid Propane Gas Filter

c. The secondary regulator is a lockoff device as well as a fuel regulation unit and controls the flow of fuel to the carburetor. It operates by engine suction when the engine is running, and locks off the fuel flow when the engine is stopped. The converter is equipped with a priming device for starting. The primer when depressed causes the secondary regulator to leak thus filling the carburetor lines and manifold with fuel sufficient to start the engine, and suction takes over and operates the secondary regulator to continue the flow of fuel. Both primary and secondary regulators are controlled by spring pressure and do not require adjustment.

FILTER (Fig. 82)

Remove the drain plug from bottom of the Filter and drain any particles trapped in filter bowl. By removing the six screws in the cover, the bowl and filtering element may be removed for cleaning or replacing.

ADJUSTING PROCEDURES

The following adjustments are essential to obtain the best performance of the engine operating system. Run engine to reach operating temperature before adjusting. In making adjustments, it is best to use a Tachometer and Fuel Analyzer.

APPROXIMATE IDLE

Screw idler adjustment (Fig. 80) in (for lean) or out (for rich) until a good smooth idle is obtained. This may be checked by means of manifold vacuum; the best idle is at the highest vacuum.

POWER ADJUSTMENT

Screw economizer adjustment all the way in. Set engine at 1400 rpm with throttle stop screw. After engine has stabilized at this speed, set power adjustment to read 12.5 on fuel analyzer. Tighten screw on meter tube after adjustment. If a fuel analyzer is not available proceed as follows: Set engine at 1400 rpm with throttle stop screw.

After engine has stabilized at this speed, rotate meter tube dial to the lean side until engine rpm starts to fall off, mark this point. Rotate the dial to the rich side until engine rpm again falls off and mark this point. Go halfway between marks and set 2 to 3 serations to the rich side.

ECONOMIZER ADJUSTMENT

With engine running at 1400 rpm after making power adjustment, turn out economizer screw gradually until engine has reached peak rpm at this throttle setting and begins to lose speed. Turn screw back in until peak rpm is reached, and tighten locknut. Fuel analyzer will read between 13.8 and 14.4 with this adjustment.

FINAL IDLE ADJUSTMENT

With main jet and economizer set as above, adjust idle screw for smoothest idle. The throttle stop screw is set for desired idle rpm. Making this final adjustment will not affect the correct power or economizer settings.

PRIMER ADJUSTMENT

Run engine at 700 rpm. Loosen locknut and turn primer out (counter-clockwise) a couple of turns. Press primer button and turn primer in (clockwise) until mixture richens to drop engine 350 to 400 rpms.

CAUTION: Under no circumstances should power settings be made too lean as this will result in poor economy and possible engine damage.

Most analyzers may reverse their reading if they have been subjected to an overly lean or rich condition. If satifactory reading cannot be attained, check analyzer.

SPARK PLUGS

The spark plug usage chart for L.P.G. engines should be as follows:

H, HB, HC-318	XJ-10-Y
H-361	XJ-12-Y
HB, HC, HT-361	XN-6
H-413	XJ-12-Y
HB, HC, HT-413	XN-6

PREPARATION FOR STORAGE

When the engine is to be stored or removed from operation for an extended period of time, the following precautions should be taken to prevent rust accumulation, corrosion of bearing and mating surfaces within the engine, and gum formation in the fuel system:

1. Drain the lubricating oil from the engine and add 2½ quarts of Rust Preventive Oil which may be obtained from a reliable oil company.

2. Drain the cooling system, add MOPAR RUST RESISTOR and fill with clean water.

3. Add one quart of special rust preventive oil to each five gallon of gasoline in the fuel tank.

4. Drain the fuel tank and operate the engine until the carburetor runs dry.

NOTE: The purpose of this operation is to aid in preventing the carburetor from being contaminated with gums that normally form in the gasoline as a result of its prolonged exposure to the oxygen in the air. Failure to take this precaution generally results in carburetor flat spots or other carburetor malfunctioning.

5. Remove the spark plugs and pour two ounces of rust preventive oil into each spark plug opening. Turn the engine over four or five revolutions with the starting motor to distribute the rust preventive oil on the cylinder walls and install the plugs.

6. Remove the cylinder head covers, and using a clean paint brush, coat the rocker arms, the rocker arm shafts, the valve springs, the push rods and the valve stems with special rust preventive oil.

7. Drain the cooling system.

8. Remove the carburetor air cleaner, the oil filler pipe air cleaner and the outlet ventilator pipe cleaner. Seal the openings with masking or adhesive tape. Also, seal the exhaust outlet opening in the exhaust manifold or exhaust pipe.

9. Replace the element in the oil filter after cleaning the filter housing.

10. Remove the storage battery and store in a cool, dry place. Replenish the water in the battery cells to cover the plates ⅜ inch. See

that the battery is fully charged and keep it fully charged during the idle period.

11. Protect the engine with a waterproof cover if it is exposed to the weather.

12. Make periodic inspections to see that the engine is properly stored and that all seals are intact.

13. The Rust Preventive Oil should be drained prior to putting the engine back into operation. The crankcase should then be filled with the recommended engine oil for the operating conditions being encountered.

ORDERING OF PARTS

The exploded views shown in this book are intended to enable the operator to better understand the general construction of Chrysler Industrial Engines, and to assist in ordering parts.

The views are helpful in determining the sequence of assembly and function of the various parts; therefore, they will be of considerable assistance when making adjustments or repairs.

IMPORTANT

Orders for parts should be placed with the nearest Authorized Dealer. Authorized Dealers are in possession of complete parts information and can, in most instances, promptly supply your parts requirements from their inventory. If you do not know the location of your nearest Chrysler Industrial Engine Dealer, a card addressed to the Industrial Engine Division, Chrysler Corporation, 12000 E. Jefferson, Detroit 15, Michigan, will bring you his name and address promptly.

Most important in ordering parts is the proper identification of the engine. Always mention the Model, Type and Serial Number. (Sample: Model Ind. H-318-102, Type 140, Serial Number 39540.) This information is stamped on the identification plate (Located on the rear side of the left cylinder head) and should be mentioned in all parts orders or communications. The number stamped on the front end of the cylinder block just back of the water pump is a manufacturing code and should not be used for the purpose of identification.

SPECIFICATIONS

Make	Chrysler V-8 Industrial Engines						
Model	H-318 HB-318	HC-318	H-361	HB-361 HC-361	HT-361	H-413 HB-413 HC-413 HCI-413	HT-413
Type	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline
Cylinders	90° V-8	90° V-8	90° V-8	90° V-8	90° V-8	90° V-8	90° V-8
Bore	3.910 In.	3.910 In.	4.125 In.	4.125 In.	4.125 In.	4.188 In.	4.188 In.
Stroke	3.31 In.	3.31 In.	3.375 In.	3.375 In.	3.375 In.	3.750 In.	3.750 In.
Piston Displacement	318 Cu. In.	318 Cu. In.	361 Cu. In.	361 Cu. In.	361 Cu. In.	413 Cu. In.	413 Cu. In.
Horsepower Rating	190 @ 4000	190 @ 4000	200 @ 4000	205 @ 4000	200 @ 4000	214 @ 4000	214 @ 4000
Compression Ratio	8.25:1	8.25:1	8.0:1	7.3:1	7.5:1	8.0:1	7.5:1
Compression Pressure at 150 rpm	120-150 psi	120-150 psi	120-150 psi	120-150 psi	120-150 psi	120-150 psi	120-150 psi
Maximum Variations Between Cylinders	20 psi	20 psi	20 psi	20 psi	20 psi	20 psi	20 psi
Cylinder Numbering as Viewed from Flywheel End of Engine							
(Left Bank)	1-3-5-7	1-3-5-7	1-3-5-7	1-3-5-7	1-3-5-7	1-3-5-7	1-3-5-7
(Right Bank)	2-4-6-8	2-4-6-8	2-4-6-8	2-4-6-8	2-4-6-8	2-4-6-8	2-4-6-8
(Firing Order)	1-8-4-3-6-5-7-2						

SPECIFICATIONS CONT'D

Oil Pressure (Operating at 2000 R. P. M.)	45-65 psi	45-65 psi	45-65 psi	45-65 psi	45-65 psi	45-65 psi	45-65 psi
Oil Pressure Idling at 500 rpm (Minimum)	15 psi	15 psi	15 psi	15 psi	15 psi	15 psi	15 psi
Cooling System Capacity Without Radiator	16½ qts.	16½ qts.	12½ qts.	12½ qts.	12½ qts.	12½ qts.	12½ qts.
With Radiator	20 qts.	20 qts.	16 qts.	21 qts.	21 qts.	16 qts.	21 qts.
Crankcase Capacity	5 qts.*	5 qts.*	5 qts.*	5 qts.*	8 qts.‡%	5 qts.*	8 qts.‡

*Add one additional quart of engine oil when single filter element is changed.

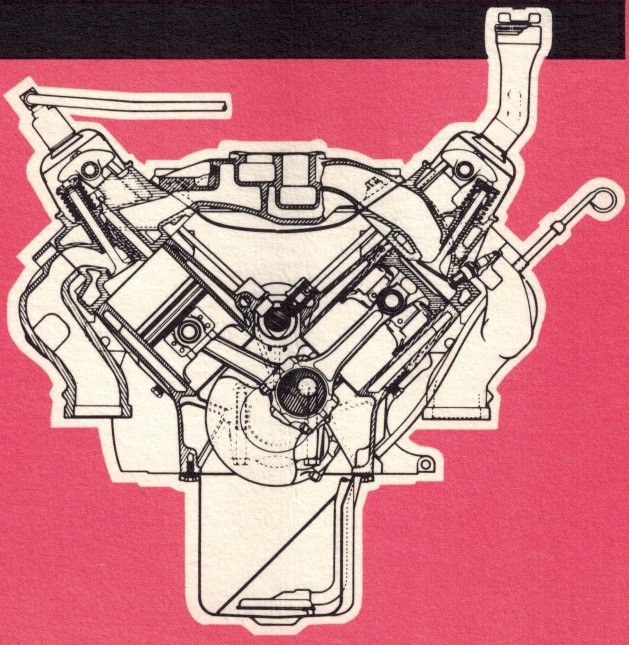
‡Add two additional quarts of engine oil when vertical mounted filter element is changed.

%Add three additional quarts of engine oil when dual oil filter elements are changed.

CHRYSLER

INDUSTRIAL

ENGINES



CHRYSLER CORPORATION
INDUSTRIAL PRODUCTS DIVISION
DETROIT 31, MICHIGAN