PM 318R 2357 0322

MOTOR SERIAL #

Chrysler

V-8

MARINE ENGINES

OPERATING MANUAL

WARRANTY

Marine Division of Chrysler Corporation warrants its new products to be free from defects in material and workmanship under normal use and service during the period specified below for the type of product indicated:

Marine Engines—for six (6) months after delivery to the first user thereof or for eighteen (18) months from the date such engines were shipped from Marine Division's factory, whichever occurs first.

Engine Accessories (such as ignition system, starting devices, batteries, alternators, carburetors or other trade accessories) in finished form and installed on a Marine Engine and purchased new from other manufacturers for that purpose—for the greater of either (1) ninety (90) days after delivery to the first user thereof or fifteen (15) months from the date such engines were shipped from Marine Division's factory, whichever occurs first, or (2) the period specified by such other manufacturer.

All other new products (not otherwise covered hereby)—for ninety (90) days from the date such products were shipped from Marine Division's factory.

During the warranty periods specified above, Marine Division will make good at its factory any part or parts of such products returned to it (with transportation charges prepaid) which its examination shall disclose to its satisfaction to have been thus defective; provided it receives written notice of any such claimed defect within thirty (30) days from the date of discovery.

This warranty will not apply to any Marine Division engine or product which, in the judgment of Marine Division, has been improperly installed, or which has been subject to misuse, negligence or accident, or which shall have been equipped or repaired with any parts not supplied or approved by Marine Division, or which shall have been altered or repaired outside of one of its authorized service stations in any way so as, in the judgment of Marine Division, to affect the stability or reliability of such engine or product.

In the absence of any contrary written agreement signed by an authorized agent of the Marine Division, this express warranty is the only warranty applicable to the Marine Division products described herein and is expressly in lieu of any warranties otherwise implied by law (including, but not limited to, implied warranties of merchantability or fitness for any particular purpose). The remedies available under this express warranty shall be the only remedies available to the purchaser with respect to defects in material or workmanship or otherwise. Marine Division neither assumes, nor authorizes anyone to assume for it, any liability in connection with the sale of its products."

IMPORTANT!

THE WARRANTY CERTIFICATION CARD INCLUDED WITH EACH ENGINE MUST BE COMPLETED AND MAILED AT THE TIME OF SALE TO THE ORIGINAL RETAIL PURCHASER.

FOREWORD

Chrysler welcomes the new owner of one of the M-Series engines; Models M-318A, M-318B, M-318C, M-383B, M-413B, M-413D, M-413E, M-426B, M-426D, and M-426SKI.

The power, performance and dependability of your new Chrysler built Marine Engine will more than meet your every demand. As a new owner, you will certainly want to know what is different about your Marine Engine and why, so that it will afford you the utmost in boating pleasure.

Read over the performance data carefully. The power curves (Figs. 1, 2, 3 and 4) show the torque and horsepower for all engine speeds on Models M-318A, M-318B, and M-318C covering a range from 190 horsepower to a maximum of 210 horsepower @ 4000 rpm; on Models M-383B, and M-413B from 260 horsepower to a maximum of 280 horsepower @ 4000 rpm; on Models M-413E and M-413D from 250 horsepower @ 4000 pm to a maximum of 300 horsepower @ 4400 rpm; on Models 426B and 426D from 290 horsepower to a maximum of 325 horsepower @ 4400 rpm and on Model M-426SKI, 415 horsepower @ 5600 rpm.

In order to obtain every advantage of the quality features of these engines over a period of time, it is suggested that you read the operating manual instructions completely, and handle your engine accordingly.

The nation-wide organization of Chrysler Marine Engine Centers are ready to aid you in maintaining your Chrysler Marine Engine in top operating condition. They are equipped with the necessary special tools and employ skilled mechanics and technicians who have been specially trained to work on Chrysler Marine Engines.

The Manual explains the terms of our Warranty as well as providing you with a regular, easy to follow maintenance service plan for your Chrysler Marine Engine.

Many hours of carefree boating are yours, if the above instructions are followed. They will insure dependable operation, performance and complete satisfaction.

SPECIFI

Model Name	Fury 190	Fury 210	Fury 195	Newport 260
Type	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline	4 stroke cycle gasoline
Number of Cylinders	90° V-8	90° V-8	90° V-8	90° V-8
Cylinder Bore	3.910 in.	3.910 in.	3.910 in.	4.250 in.
Stroke	3.31 in.	3.31 in.	3.31 in.	3.38 in.
Piston Displacement	318 cu. in.	318 cu. in.	318 cu. in.	383 cu. in.
Compression Ratio	8.2:1	8.2:1	8.2:1	8.2:1
Compression Pressure	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm
Maximum Variation Between Cylinders	20 psi	20 psi	20 psi	20 psi
Brake Horsepower (n)	190 @ 4000 rpm	210 @ 4000 rpm	195 @ 4000 rpm	260 @ 4000 rpm
Firing Order: Referring to the tation and reduction designation on the engi Serial Number Plate. The No Cylinder is the Front Cylinder on the left side when viewed from the stern looking towards the engine.			For R10, R13, R15, R25, R30 and L19* For L10, L13, L15, L25, L30 and R19*	
Engine Designat	M-318-A	M-318-B	M-318-C	M-383-B
Oil Pressure (erating at 2000 rpm)	45 to 65 psi	45 to 65 psi	45 to 65 psi	45 to 65 psi
Crankcase pacity	**8 qts. at 7° angle	**8 qts. at 7° angle	**8 qts. at 7° angle	**7 qts. at 7° angle

*Th eason for these exceptions L19 and R19 is that the Design of the Warner 1.91:1 Reduction Gear results in the propeller aft turning in the opposite direction from the engine.

**d 1 additional quart of engine oil when filter element is changed.

C A T I O N S

Golden Commando 280	Golden Lion 300	Imperial 250	Golden Commando 290	Golden Lion 310	Golden Lion 325	Golden Lion Special
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
90° V-8	90° V-8	90° V-8	90° V-8	90° V-8	90° V-8	90° V-8
4.19 in.	4.19 in.	4.19 in.	4.25 in.	4.25 in.	4.25 in.	4.25 in.
3.750 in.	3.750 in.	3.750 in.	3.750 in.	3.750 in.	3.750 in.	3.750 in.
413 cu. in.	413 cu. in.	413 cu. in.	426 cu. in.	426 cu. in.	426 cu. in.	426 cu. in.
8.2:1	8.2:1	7.5:1	8.2:1	8.2:1	9.2:1	11.0:1
120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm	120-150 psi @ 150-200 rpm
20 psi	20 psi	20 psi	20 psi	20 psi	20 psi	20 psi
280 @ 4000 rpm	300 @ 4400 rpm	250 @ 4000 rpm	290 @ 4000 rpm	310 @ 4400 rpm	325 @ 4400 rpm	415 @ 5600 rpm

The Firing Order is: 1-2-7-5-6-3-4-8
The Firing Order is: 1-8-4-3-6-5-7-2

M-413-B	M-413-D	M-413-E	M-426-B	M-426-D	M-426-D	M-426-SKI
45 to 65 psi	45 to 65 psi	45 to 65 psi	45 to 65 psi	45 to 65 psi	45 to 65 psi	45 to 65 psi
**7 qts. at 7° angle	**7 qts. at 7° angle	**7 qts. at 7° angle	**7 qts. at 7° angle	**7 qts. at 7° angle	**7 qts. at 7° angle	**7 qts. at 7° angle

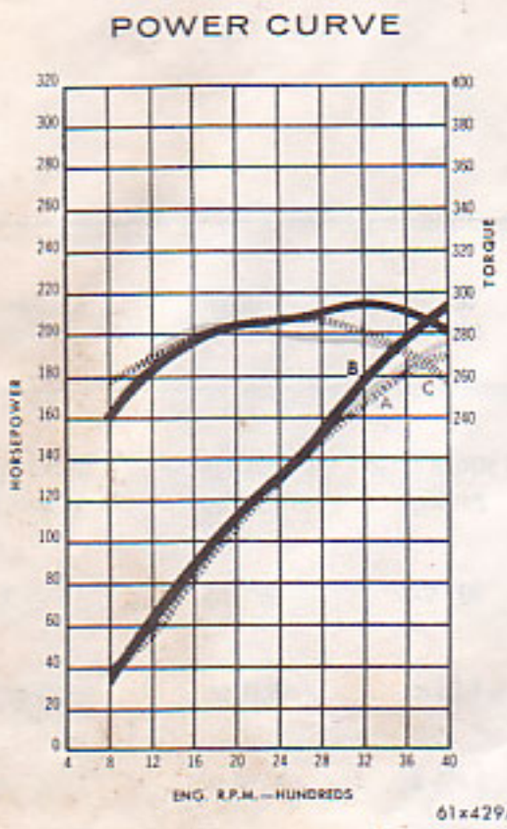


Figure 1—Power Curve Showing Torque and Horsepower Models M-318A, B, C

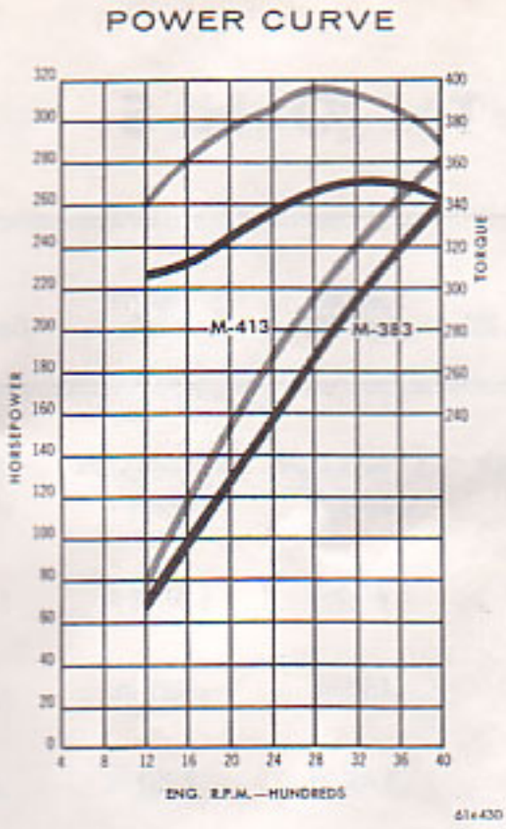


Figure 2—Power Curve Showing Torque and Horsepower Models M-383B, M-413B

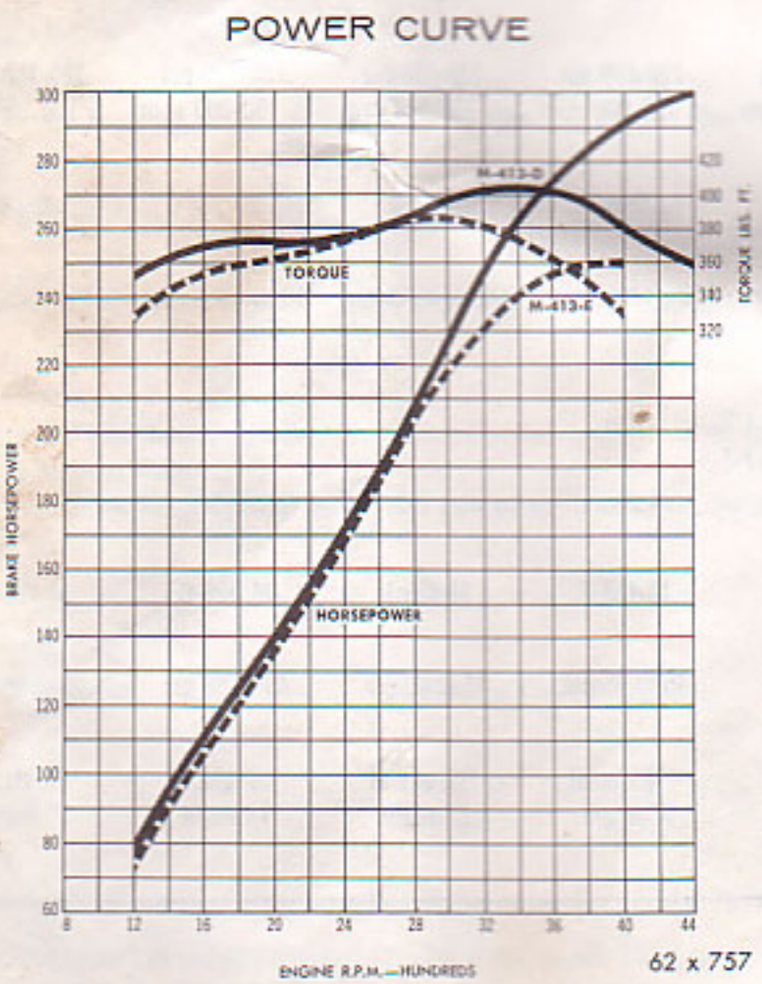
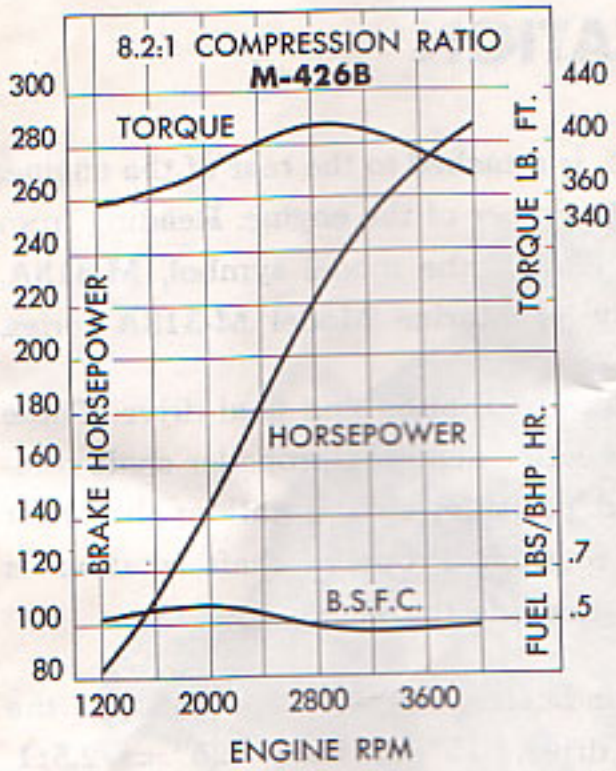


Figure 3—Power Curve Showing Torque and Horsepower Models M-413D, M-413E



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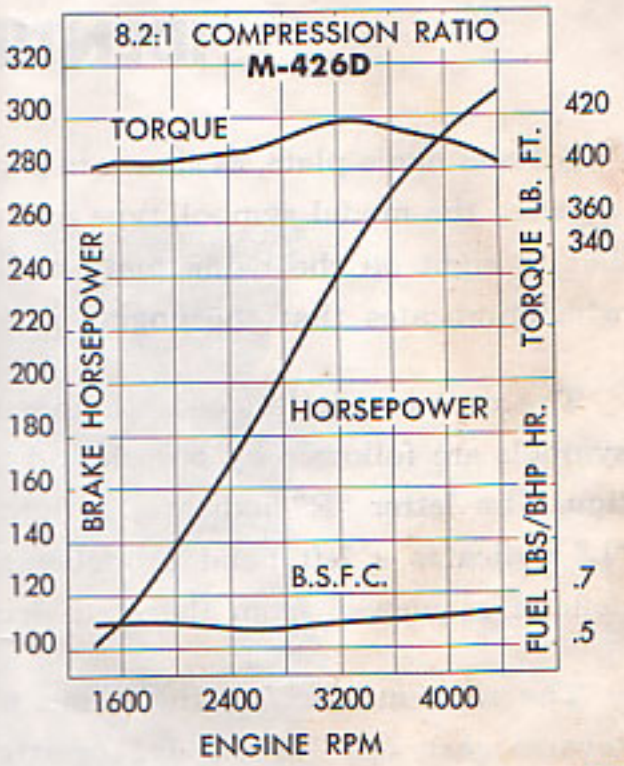

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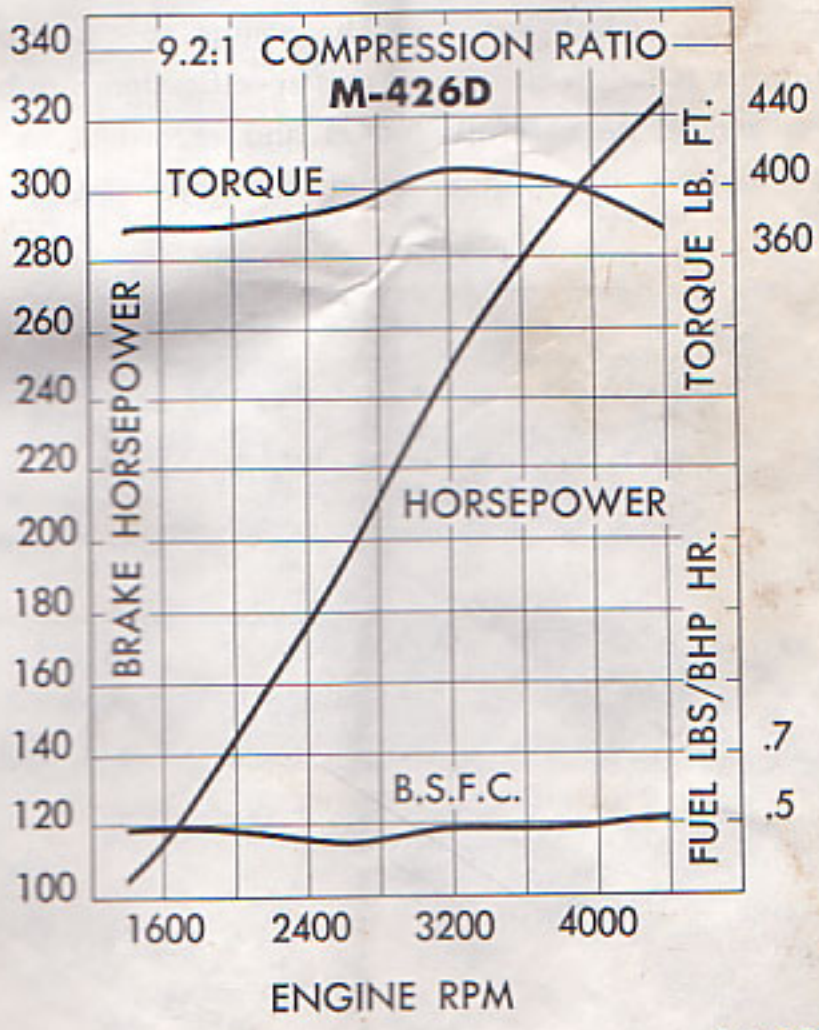

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Figure 4—Power Curve Showing Torque and Horsepower Models M-426B, M-426D

IDENTIFICATION

A brass name plate, as shown in Figure 5, is attached to the rear of the engine, showing the model symbol, type and serial number of the engine. Reading from left to right on the name plate, the first item is the model symbol, M-318A, which indicates that the engine is a Chrysler Marine Model M-318A series.

The next two letters code the engine output variation and final drive. These symbols are followed by a dash and then a letter denoting propeller shaft rotation. The letter "R" indicates a right hand propeller shaft rotation; the letter "L" indicates a left hand propeller shaft rotation. Propeller shaft rotation is defined as viewed from the stern looking towards the engine.

The next number on the name plate indicates the reduction ratio of the reverse gear, i.e., "10" = 1:1 or straight drive, "15" = 1.5:1, "25" = 2.5:1. When used with outdrives the same procedures are used.

This is followed by a dash and then the engine specification number. The engine serial number is below the model and specification number. In all events this information should be carefully noted and recorded and kept with the ship's papers to identify the engine, and always referred to in servicing the engine.

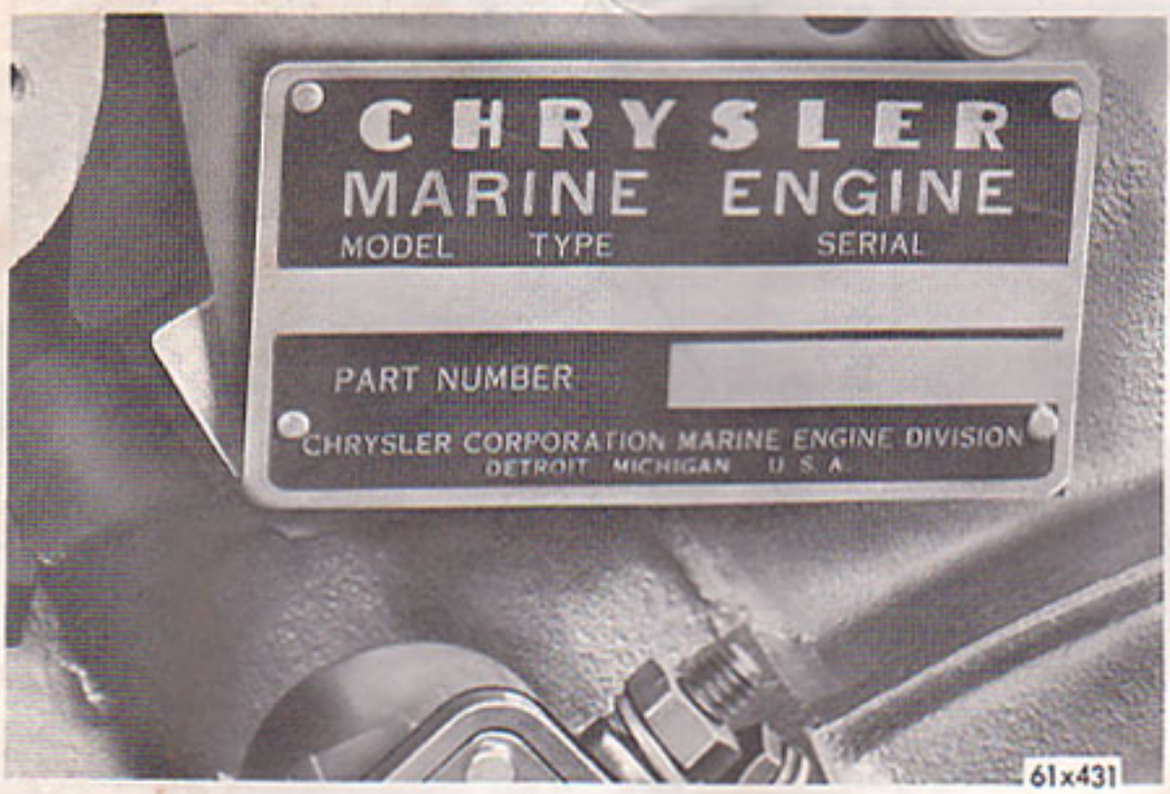

Figure 5—Engine Model and Serial Number Plate

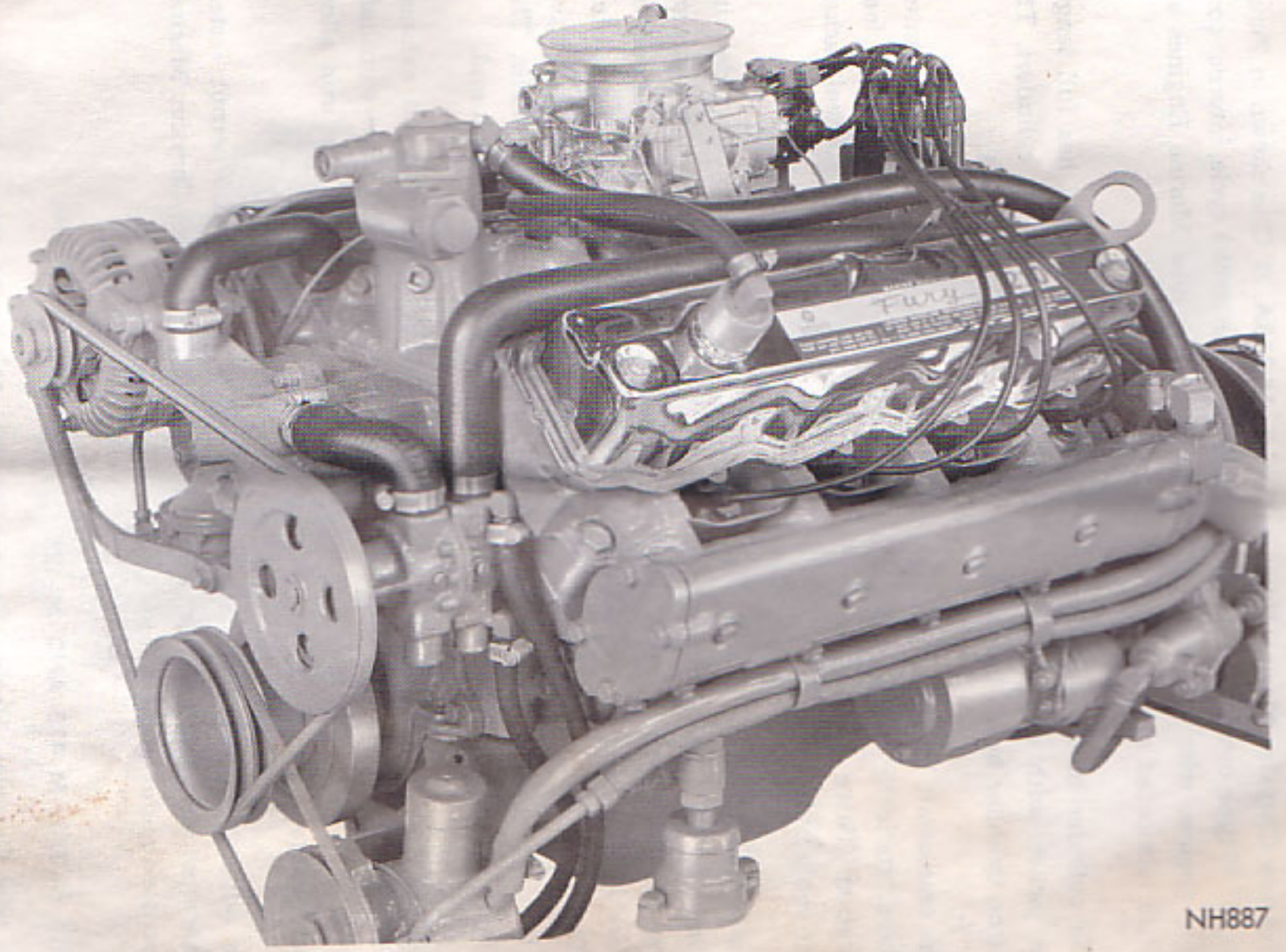

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Figure 6—Left Side View of Model M-318B Marine Engine

CONSTRUCTION

MODELS M-318A, B, C

The new Chrysler Marine Engines Models M-318A, B, C as shown in Figure 6 are 90° V-type overhead valves eight cylinder, four stroke cycle, internal combustion engines with offset valve arrangement. The new Marine Engines are pressure lubricated and liquid cooled.

The cylinder block is made of high strength cast iron and has full length water jackets with water circulated completely around all the cylinders. The cast iron cylinder heads have polyspherical combustion chambers.

The crankshaft has 2½ inch diameter main bearing journals, and is counterweighted, statically and dynamically balanced and is drilled for forced feed lubrication. There are five main bearings, with precision type steel-backed babbit removable shells.

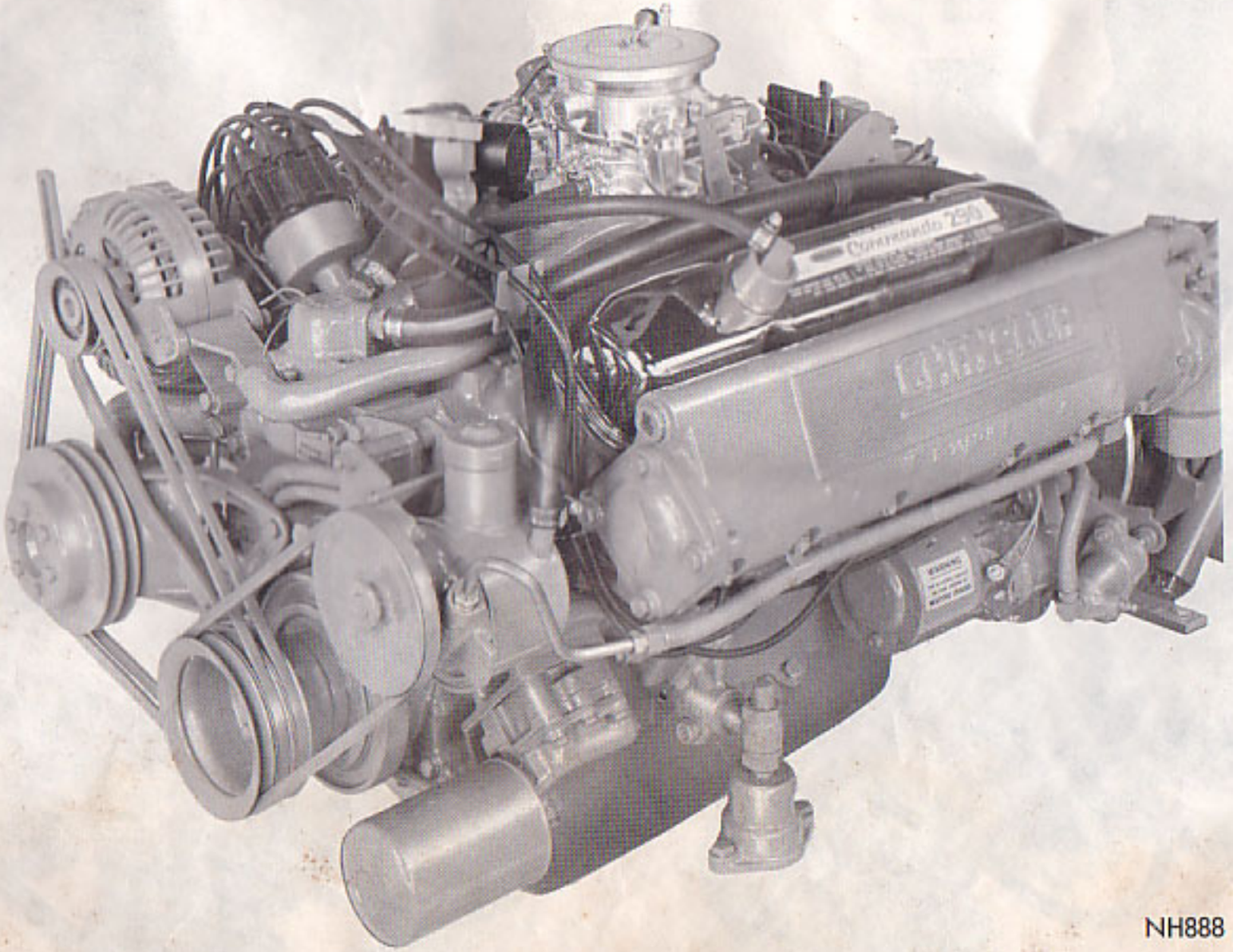
The aluminum alloy pistons are tin plated, and are conformatic type with steel band to automatically compensate for thermal expansion. The top rings are chrome plated and the pistons are balanced within two grams. The connecting rods are forged manganese alloy steel with I section shank, floating type piston pin. The piston ends are fitted with bronze bushings, and the crank end is fitted with precision type steel backed, grid babbit removable bearing shells. The weight distribution is controlled within close limits separately at each end.

The valves are made of high strength alloy steel. Both inlet and exhaust valves have special valve springs to resist corrosion and fatigue. The camshaft is driven by a silent chain and is constructed of high strength cast iron alloy and is pressure lubricated.

The adjustable engine mounts are standard equipment and permit faster and more precise installation or realignment. All M318 Model Chrysler Marine engines use regular grade automotive type gasoline.

MODELS M-383, M-413 AND M-426

The new Chrysler Marine Engines Models M-383, M-413 and M-426, as shown in Figures 7, 8 and 9 are 90° V-type overhead valves, eight cylinder, four stroke cycle, internal combustion gasoline engines with in line valve arrangement and are pressure lubricated and liquid cooled.



NH888

Figure 7—Right Side View of Model M-413B Marine Engine

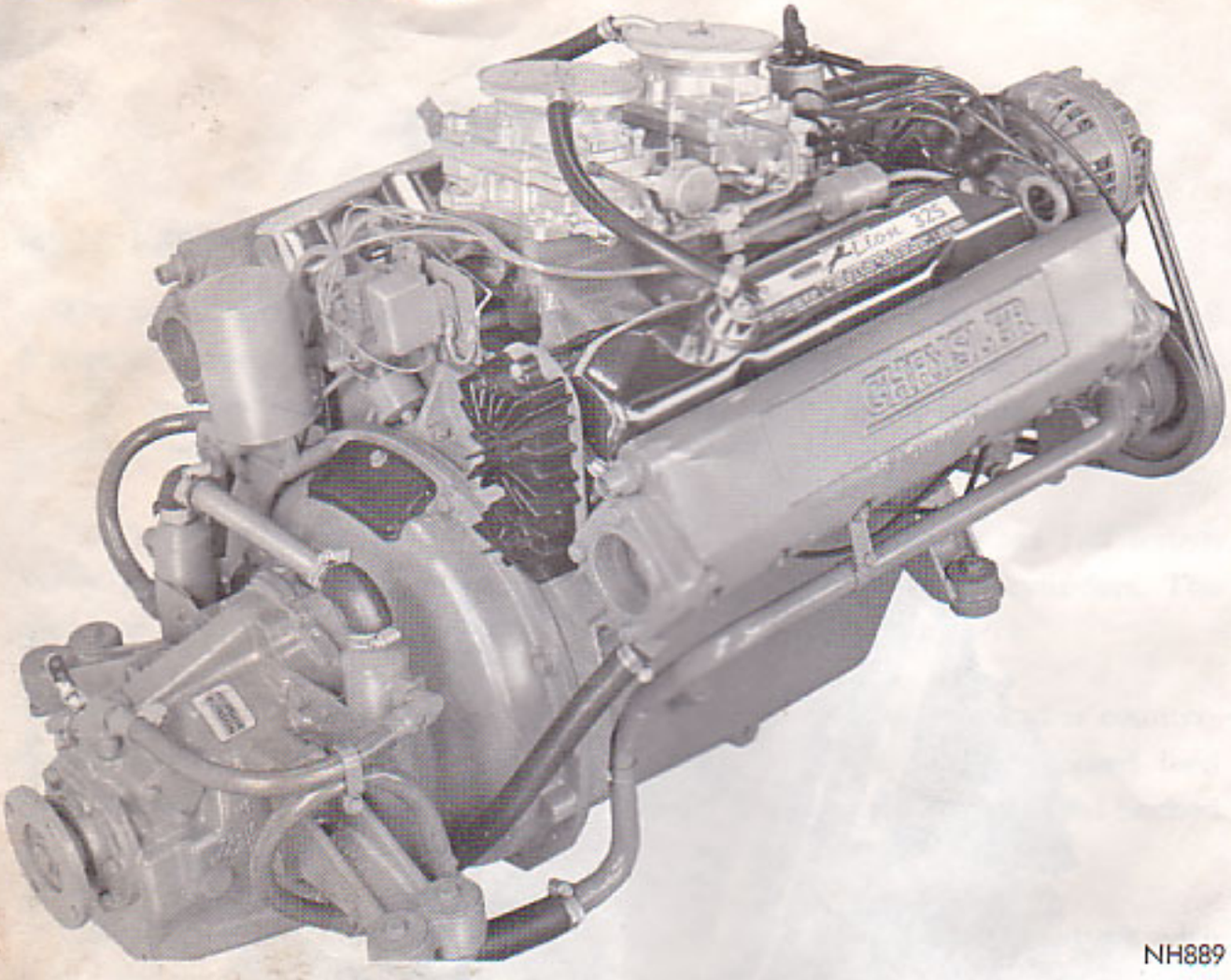


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Figure 8—Right Side View of Model M-426D Marine Engine

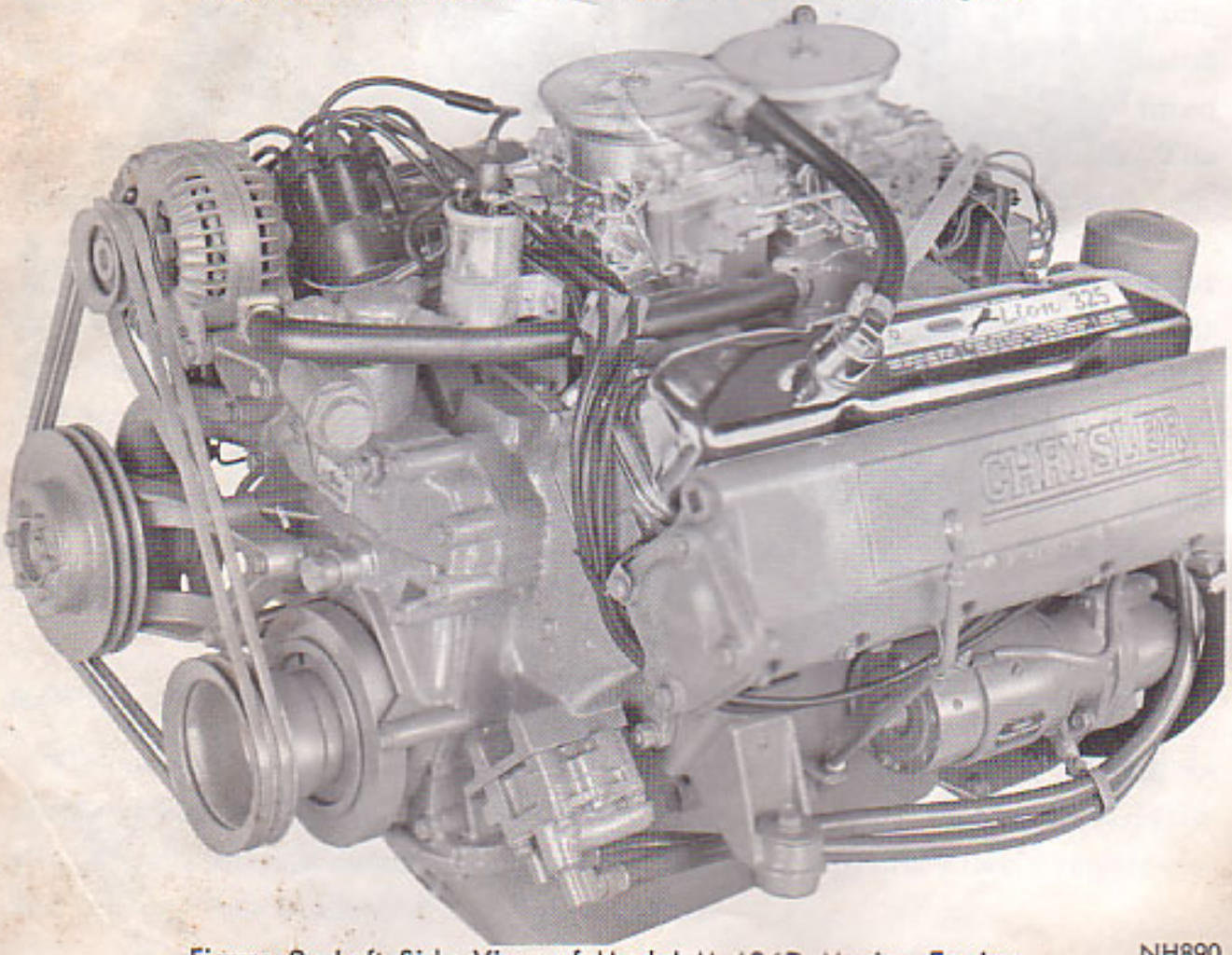

Figure 9—Left Side View of Model M-426D Marine Engine

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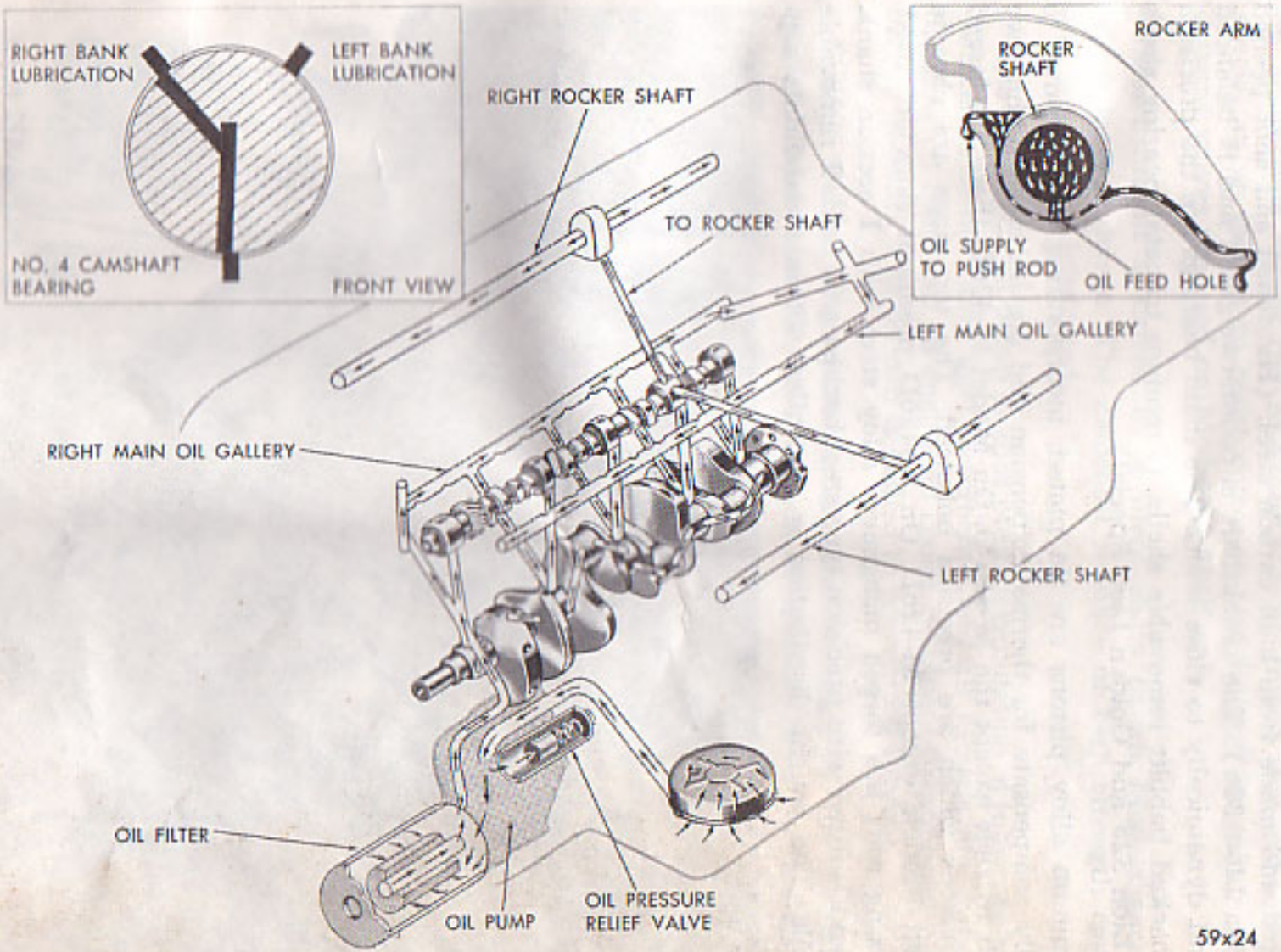


Figure 10—Engine Oil System (All Models)

The cylinder block is made of high strength cast iron, has full length water jackets with water circulated completely around all cylinders. The cylinder blocks deep crankcase design gives the greatest possible rigidity. The cast iron cylinder heads have wedge type combustion chambers.

The crankshaft incorporates 5 main bearing journals 2¾ inch diameter and is drop forged and made from high carbon steel. (Hardened and shot peened in the Golden Lion 325). The crankshaft is counterweighted and is balanced statically and dynamically to close limits. The main bearings are the precision type steel backed babbitt removable shells. (Premium trimetal bearing shells on Golden Lion 325 and Golden Lion Special).

The aluminum alloy pistons are tin plated, incorporating a steel strut to automatically compensate for thermal expansion and are balanced within two grams on all Models except the M-426-D. On Model M-426D there are forged aluminum pistons which are precision balanced. The top rings are chrome plated on all Models except M-426D. On M-426D premium rings are used. The connecting rods are forged manganese alloy steel with I section shank. The crank end is fitted with precision type steel backed grid babbitt removable bearing shells. The weight distribution is controlled within close limits sep-

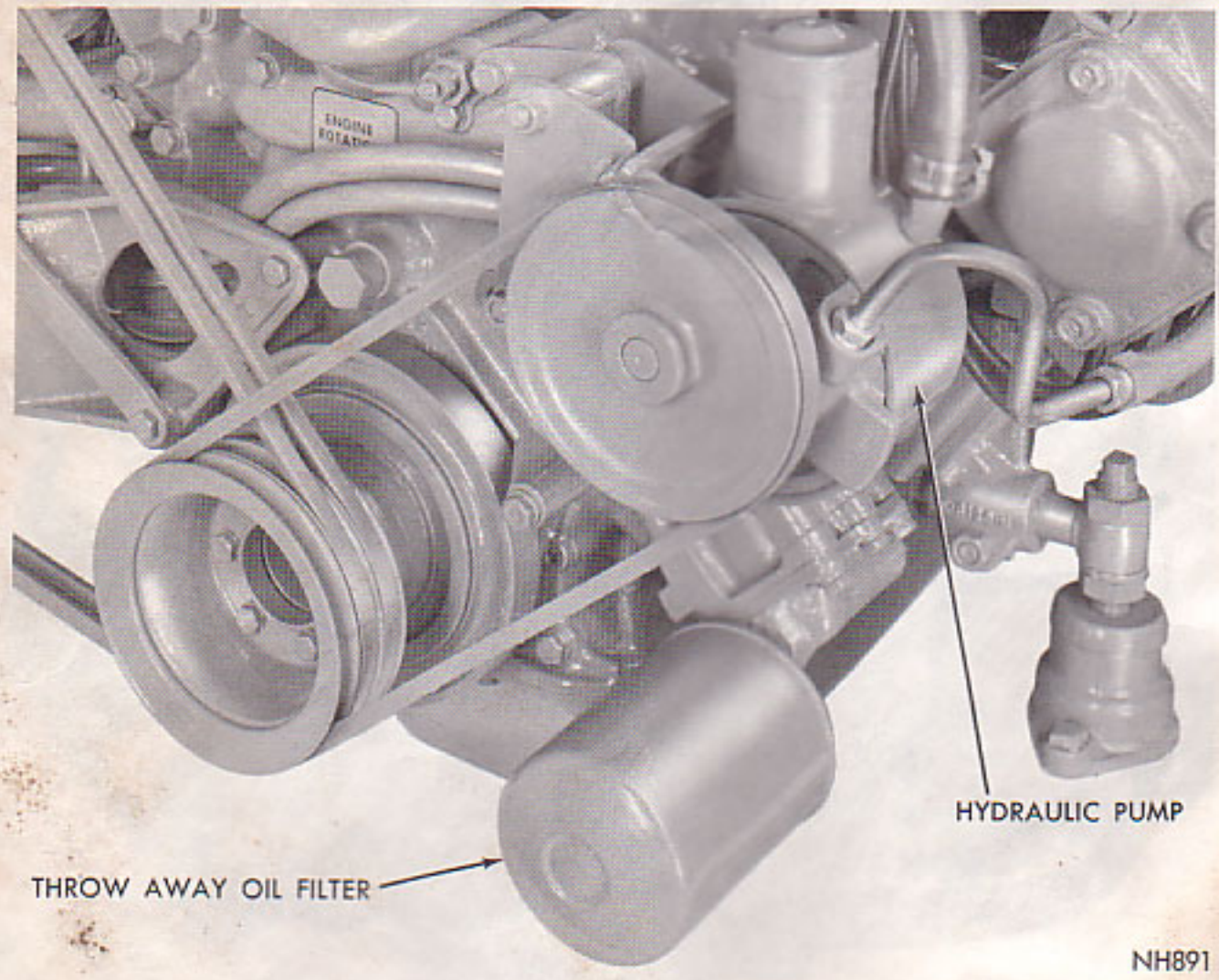


Figure 11—Oil Filter (Throw Away Type) All Models

arately at each end, on all Models except M-426D. On Model M-426D there are premium trimetal bearing shells.

The intake valves are made of silicon-chromium alloy steel. The exhaust valves are stellite faced. The exhaust valves are equipped with positive rotators on all models except the M-426SKI. Both intake and exhaust valves have special valve springs to resist corrosion and fatigue. Premium sodium cooled exhaust valves are used on Model M-413E only.

The camshaft is driven by a silent chain on all Models except M-413E which is gear driven. The camshaft is made of high strength cast iron alloy and is pressure lubricated.

The rotor type oil pump assures positive circulation of lubricant to all bearing surfaces. The oil pump inlet is screened and all Models are equipped with a full flow oil filter and an engine oil cooler is standard equipment on all Models except M-383B. The oil pan is baffled to prevent oil surging.

Dual 4 barrel down-draft carburetors are used on the Golden Lion and special Models M-413D, M-426D and M-426SKI. All other models use a single 4 barrel down-draft carburetor. All carburetors have an automatic choke as standard equipment.

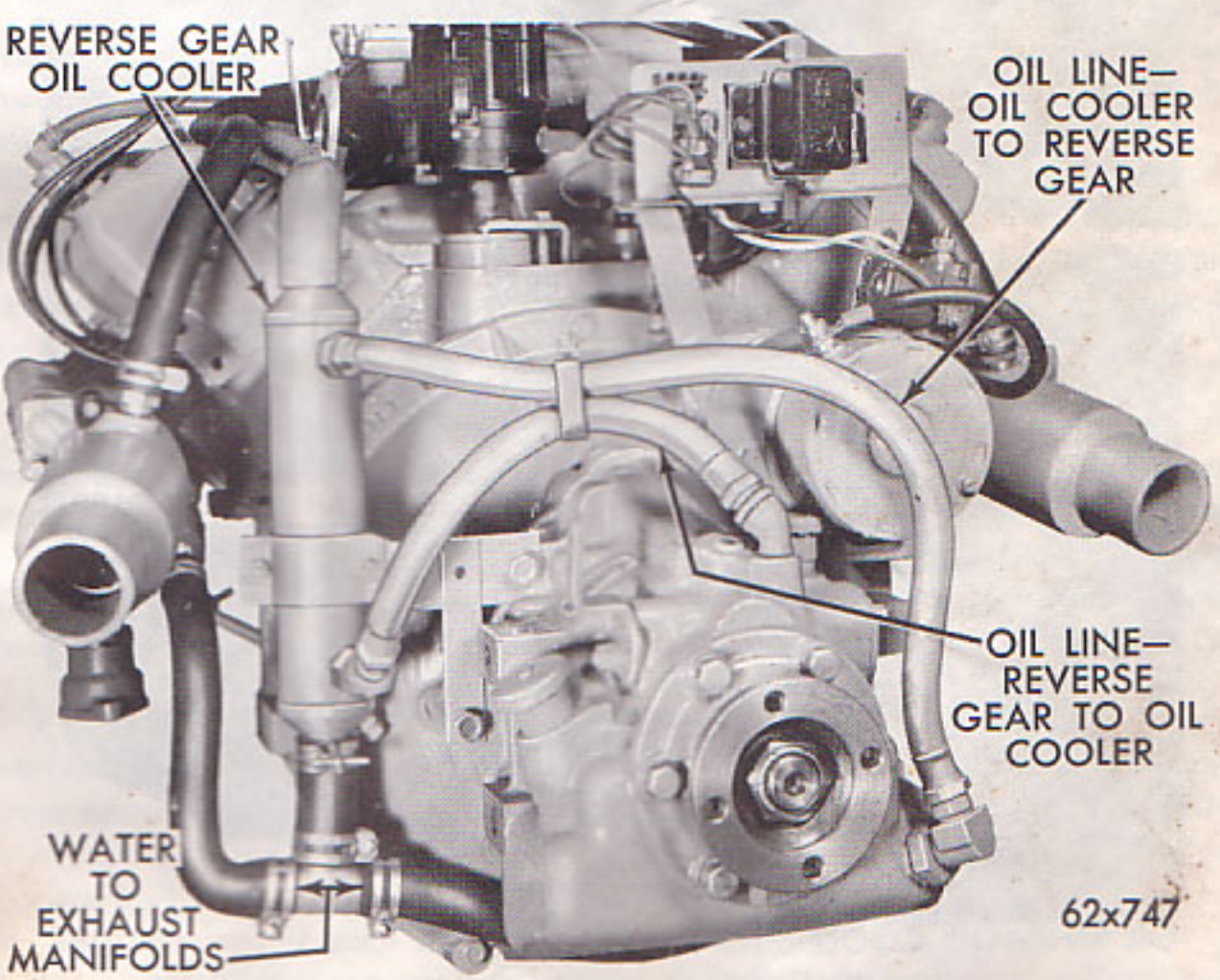


Figure 12—Reverse Gear Oil Cooler Connections Models 318

Models M-426D use premium leaded automotive type gasoline; Models M-426SKI use super premium leaded automotive type gasoline and all other Models use a good quality regular grade gasoline. See Page 32 for minimum octane ratings.

LUBRICATING SYSTEM (Fig. 10)

The engine oil pump draws oil from the oil pan through a floating intake screen. From the oil pump the oil is directed to the full flow oil filter (Fig. 11). The cleaned oil is then forced thru the main oil gallery which in turn supplies oil to all the internal parts of the engine. In the event the filter becomes plugged a bypass valve allows direct passage of the oil to the system.

The lubricating oil for the operation of the reverse gear is provided by an oil pump mounted inside of the reverse gear. The oil pump is driven continuously by the engine. This pressurized oil is delivered from the oil pump to

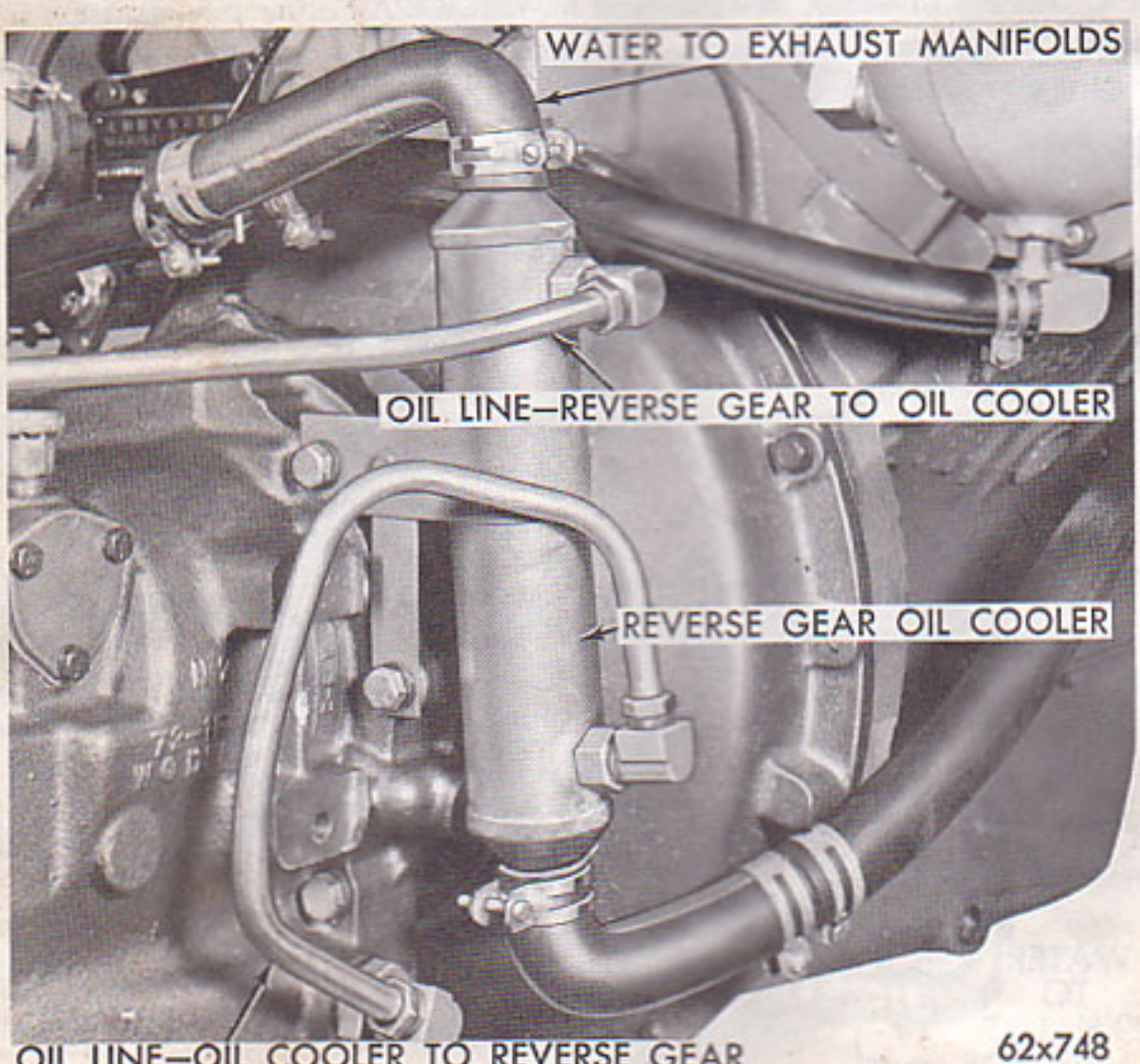


Figure 13—Reverse Gear Oil Cooler Connections Models M-383, M-413, M-426

the control valve and then forwarded to the piston depending upon the control setting for the reverse or forward operation. The reverse gear oil is separate from the engine oil. The oil is directed from the reverse gear case to a separate oil cooler and from the oil cooler the oil is returned to the reverse gear housing. The oil cooler acts in the capacity as a heat exchanger (Figs. 12 and 13).

COOLING SYSTEM

The belt driven water pump is actually two pumps in one, since two six-bladed flexible rubber impellers on one shaft have a common housing or body. The corrosion-resistant bronze housing provides a separate inlet and a separate outlet for each impeller. The water pump has one permanent lip-type water seal which requires no periodic adjustment, lubrication or servicing (except in lay-up). (Figs. 14, 15, 16, 17, 18, 19, 20 and 21).

The pump shaft is supported in a pre-lubricated housing, and is protected by a lip-type seal. An open portion of the housing, between the bearing and the impellers, precludes the possibility of water reaching the bearing from the impeller portion of the water pump body.

The dual inlets are fitted with an elbow which permits a single connection from the sea cock. The bypass connection is a part of this elbow which will further simplify the installation. If the water pump inlet is to be above the water line, straight hoses can be attached between the pump inlet and the elbow so that the bypass connections will be below the water line. The water circulation from one side of the water pump supplies water to the hydraulic pump, (If so equipped) the reverse gear oil cooler, both exhaust manifolds and then overboard thru the exhaust lines. This overboard water provides very cool exhaust and a minimum of steaming.

The water from the other section of the water pump passes through the engine right cylinder block, right cylinder head, the left cylinder block, the left cylinder head, the intake manifold and the thermostat housing in that order. From the thermostat housing, the water flows either through the bypass (Fig. 22) or past the thermostat and overboard depending on the engine cooling demand.

A choke type thermostat is used on all Models. Since the thermostat is affected by exhaust system back pressure, the control temperature will vary from approximately 125° F. to 140° F. at full throttle. The control system is designed to operate with an exhaust back pressure of 3½ psi (Pounds per Square inch). If the exhaust back pressure should exceed this, a lower temperature thermostat may be substituted to bring the top temperature to the desired level. This thermostat will reduce the idle temperature a proportionate amount.

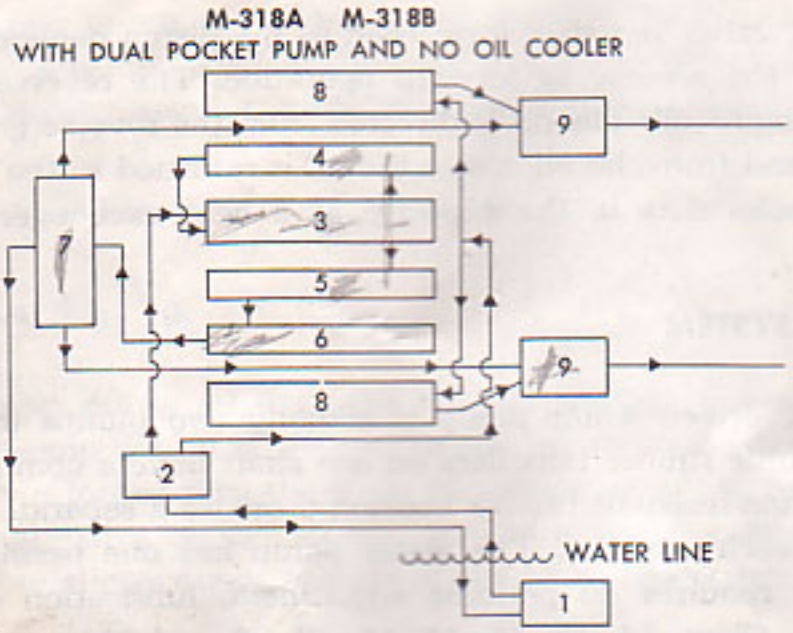


Figure 14—Cooling System Water Circulation with Dual Pocket Pump Models M-318A, M-318B

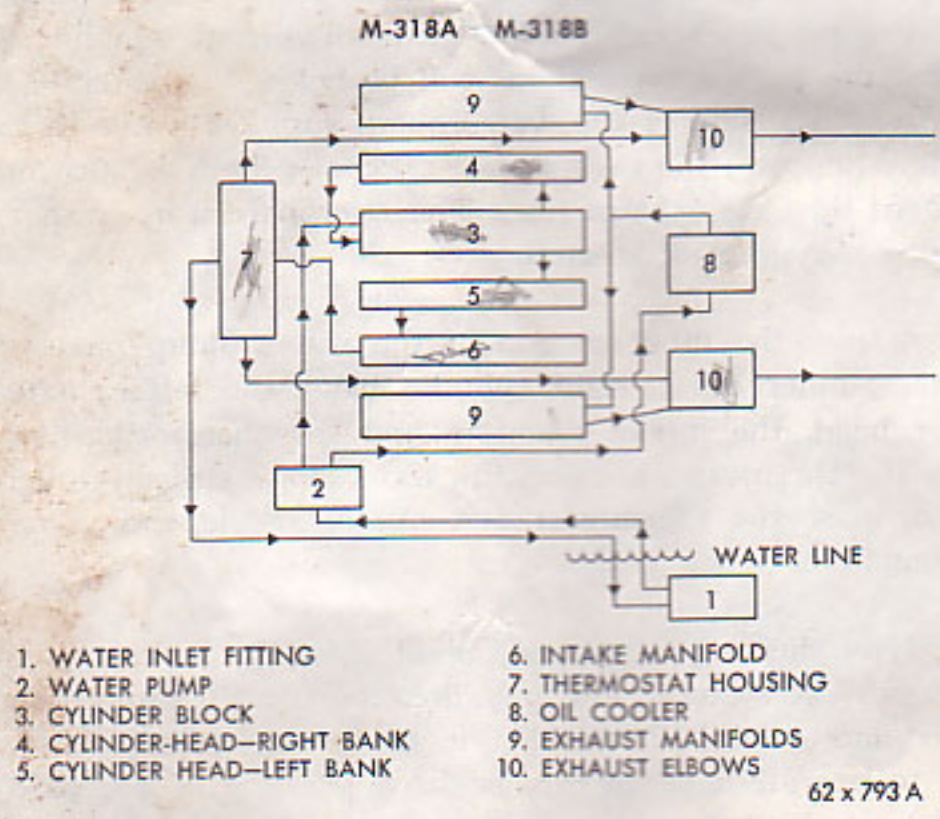


Figure 15—Cooling System Water Circulation with Dual Pocket Pump Oil Cooler Models M-318A and M-318B

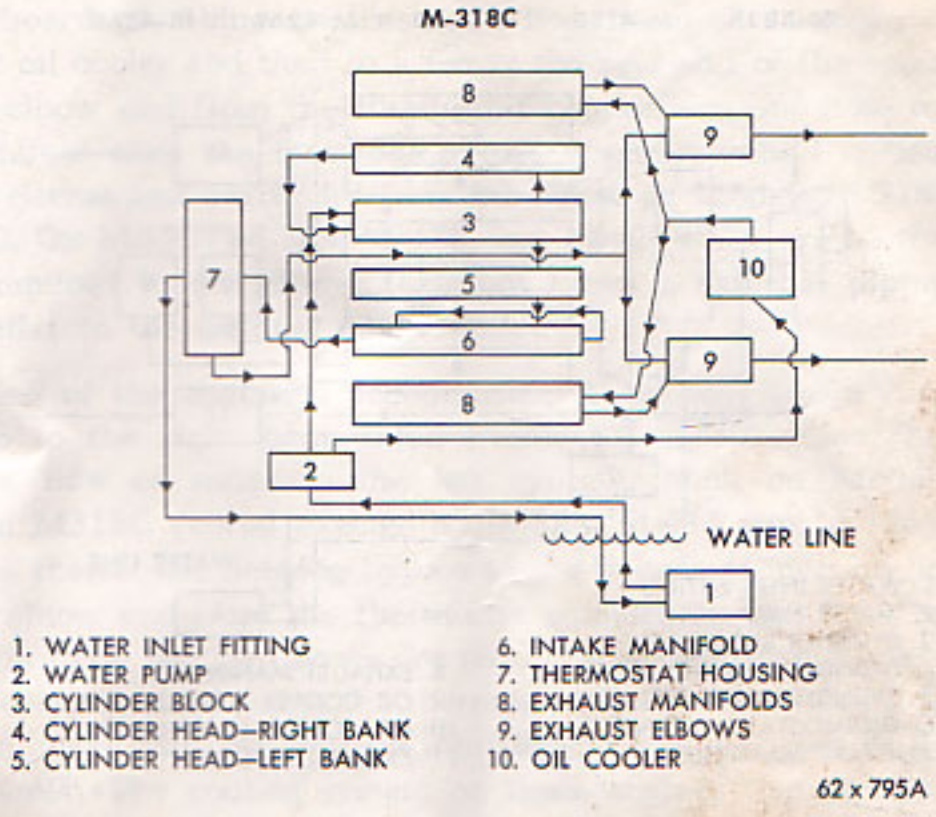


Figure 16—Cooling System Water Circulation with Dual Pocket Pump Oil Cooler Model M-318C

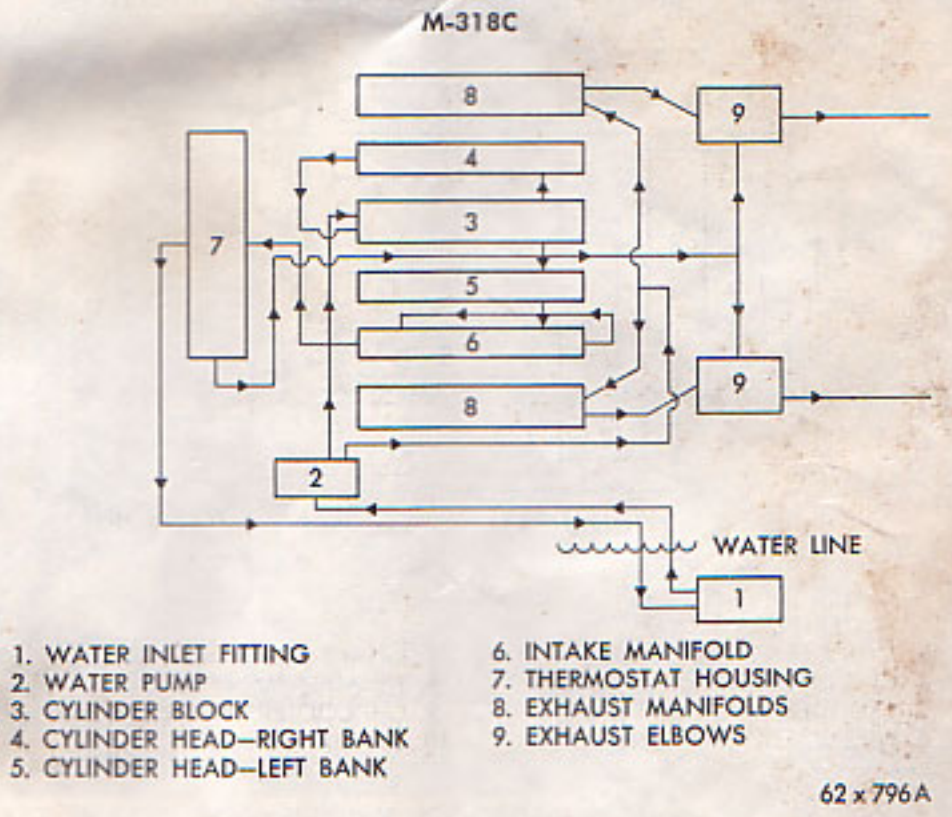
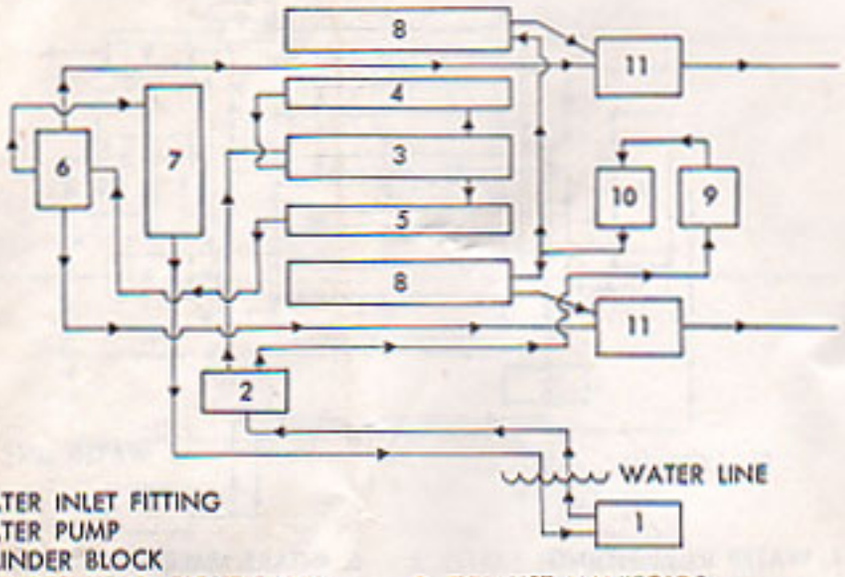


Figure 17—Cooling System Water Circulation with Dual Pocket Pump Model M-318C

M-383B M-413B M-413D M-426B M-426D

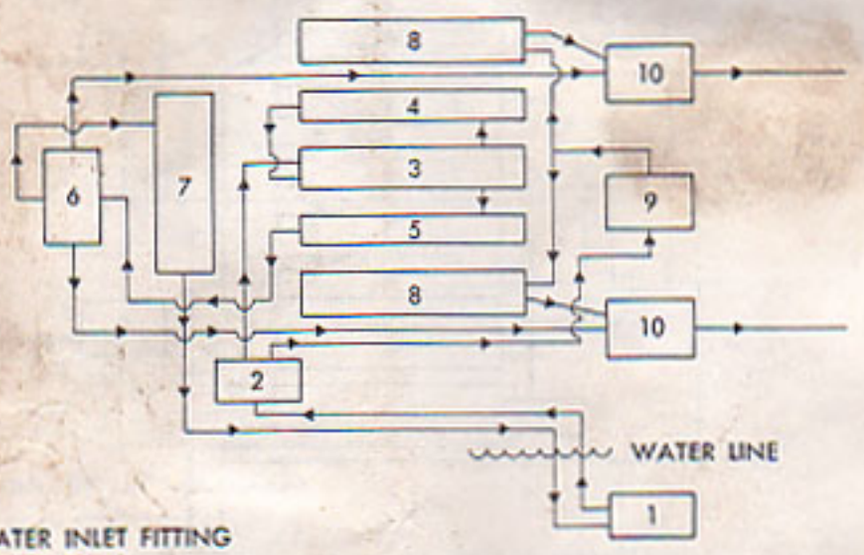


1. WATER INLET FITTING
2. WATER PUMP
3. CYLINDER BLOCK
4. CYLINDER HEAD—RIGHT BANK
5. CYLINDER HEAD—LEFT BANK
6. THERMOSTAT HOUSING
7. INTAKE MANIFOLD
8. EXHAUST MANIFOLDS
9. OIL COOLER (REVERSE GEAR)
10. OIL COOLER (ENGINE)
11. EXHAUST ELBOWS

62 x 787A

Figure 18—Cooling System Water Circulation with Oil Cooler Models M-318B, M-413B, M-413D, M-426B, M-426D

M-383B M-413B M-413D M-426B M-426D



1. WATER INLET FITTING
2. WATER PUMP
3. CYLINDER BLOCK
4. CYLINDER HEAD—RIGHT BANK
5. CYLINDER HEAD—LEFT BANK
6. THERMOSTAT HOUSING
7. INTAKE MANIFOLD
8. EXHAUST MANIFOLDS
9. OIL COOLER (REVERSE GEAR)
10. EXHAUST ELBOWS

62 x 788A

Figure 19—Cooling System Water Circulation without Engine Oil Cooler Models M-383B, M-413B, M-413D, M-426B, M-426D

The overboard plumbing consists of a hose from the water pump to the reverse gear oil cooler and then to a tee at the rear end of the engine dividing pump inlet elbow and from the thermostat connections one hose runs to each exhaust manifold thru the manifold to the upper manifold outlets and into the exhaust elbows and overboard from the elbow on Models M-318A, M-318B and M-318C. On Models M-383, M-413, and M-426 there are no thru passages from the manifold to the elbow, therefore there is external piping from the manifold outlet to the exhaust elbow outlet.

The cooling of the engine is accomplished by a hose which runs from the water pump to the right bank inlet. From the right cylinder head a hose connects the flow of water to the left cylinder bank on Models M-318A, M-318B and M318C (cored passage on M-383, M-413 and M-426). A hose is run from the thermostat housing bypass to the bypass connection on the water pump inlet elbow and from the thermostat connections one hose runs to each exhaust elbow. The last two hoses are required for high speed operation when much more cooling water passes the thermostat. Because of exhaust system back pressure, the hoses must not be teed into the same connections as the manifold overboard water. The cooling system on these engines therefore, makes for a highly efficient operation.

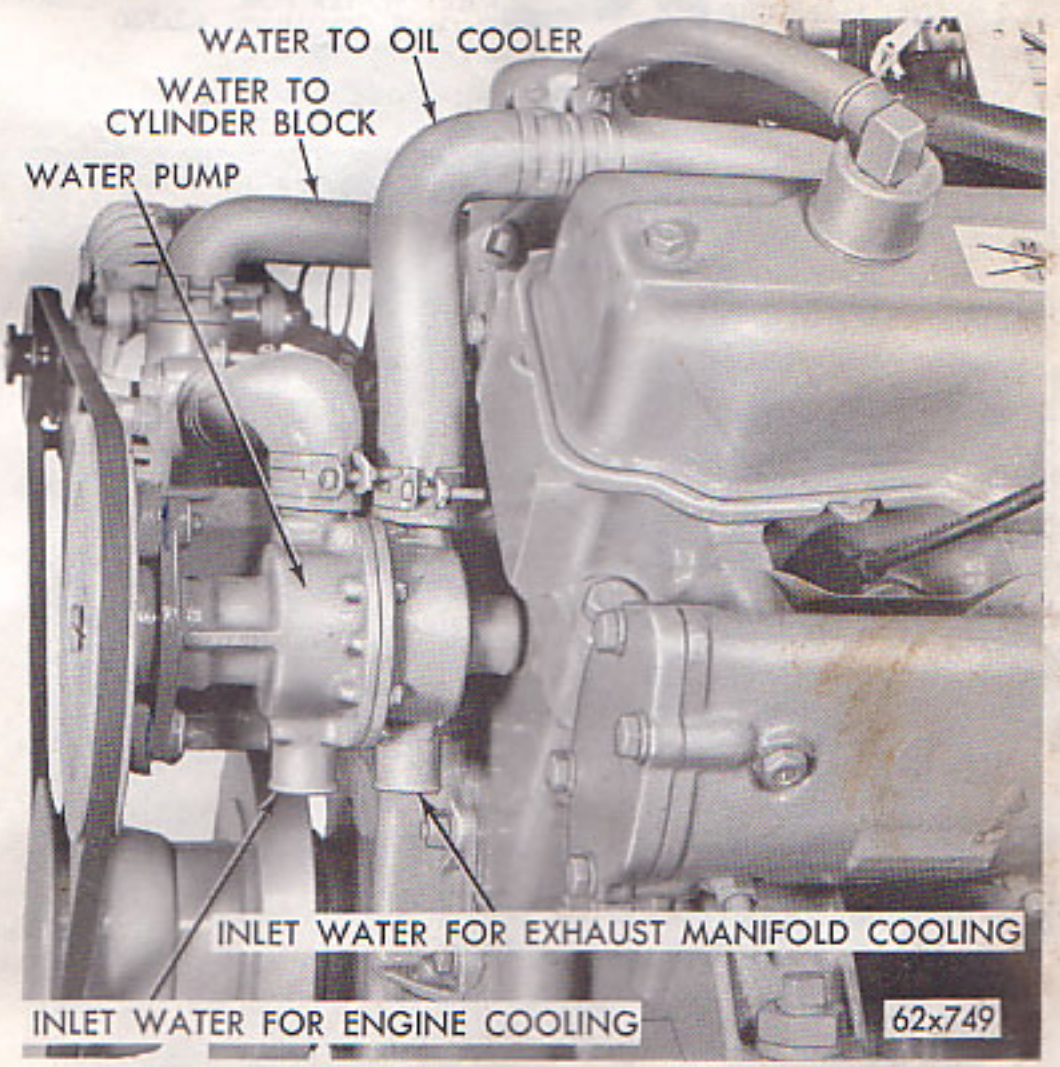


Figure 20—Water Pump Connections Model M-318

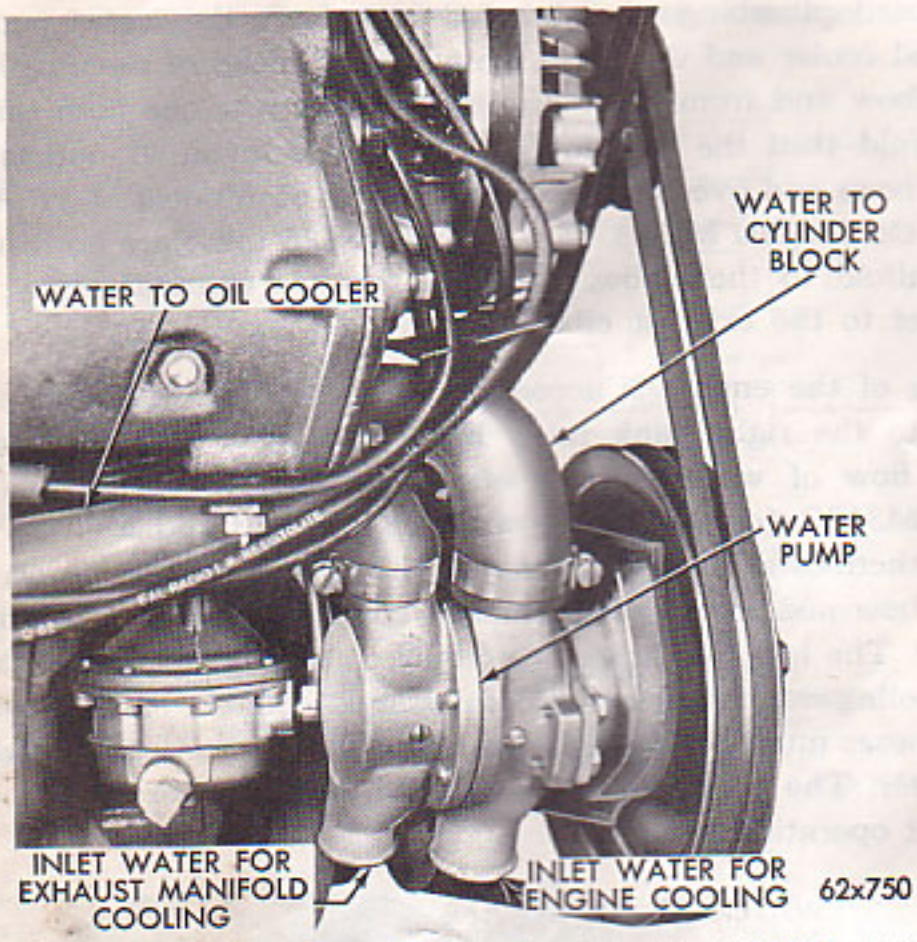


Figure 21—Water Pump Connections Models M-383B, M-413

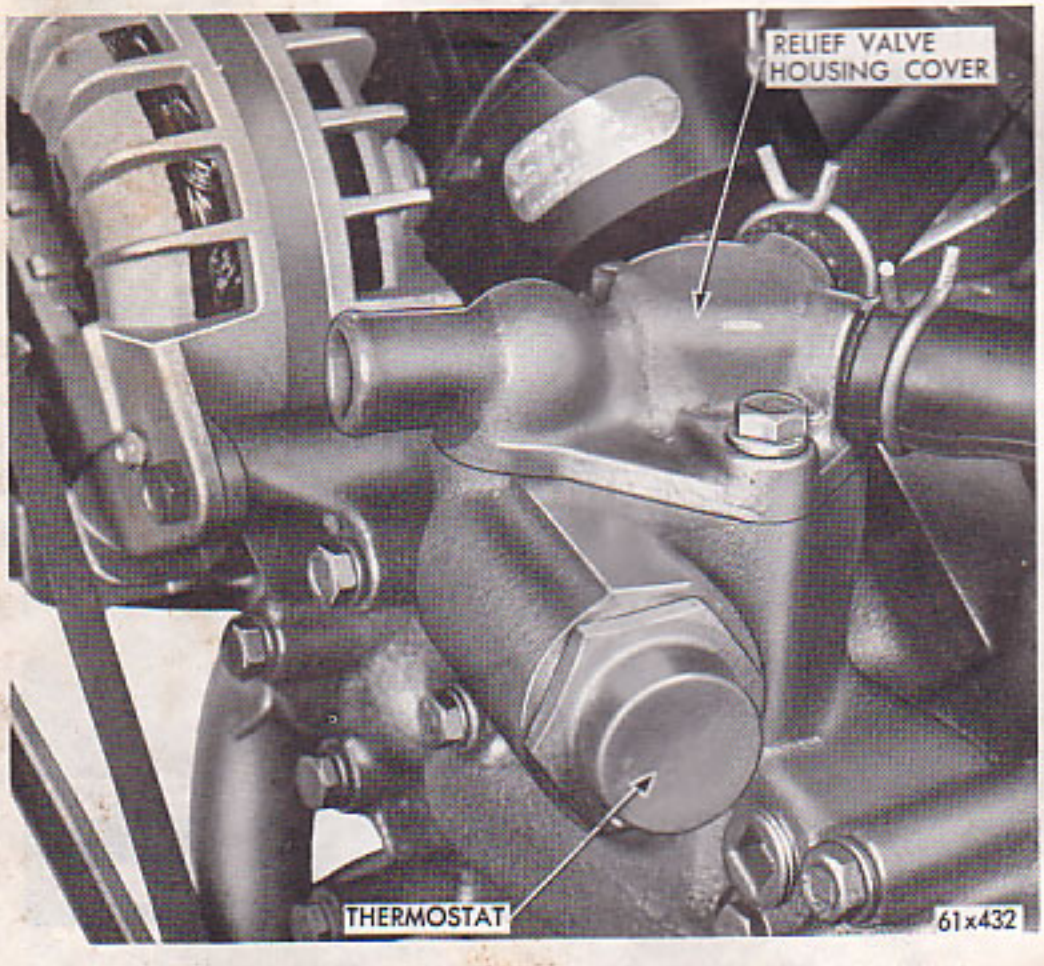


Figure 22—Location of Thermostat and Pressure Relief Valve

PROPER BELT TENSION (All Models)

Satisfactory performance of the belt driven accessories depends on the maintenance of the proper belt tension. If the specified tensions are not maintained, belt slippage may cause engine overheating, reduced alternator charging rates, and greatly reduced belt life. To avoid any such adverse effects, the following service procedure should be followed:

The belt can be tightened by measuring the deflection of the belt at the mid-point between two pulleys under a five-pound push or pull. A small spring scale can be used to establish the five-pound load. See Figure 23 for correct location at which to measure deflection.

To adjust the belt, loosen the mounting bolt, and use a bar to apply tension to the belt being careful not to damage the accessory. Tighten the mounting bolt and check the deflection. It may be necessary to repeat this procedure several times to establish the correct tension.

Any belt that has operated for a minimum of a half-hour is considered a "belt in use".

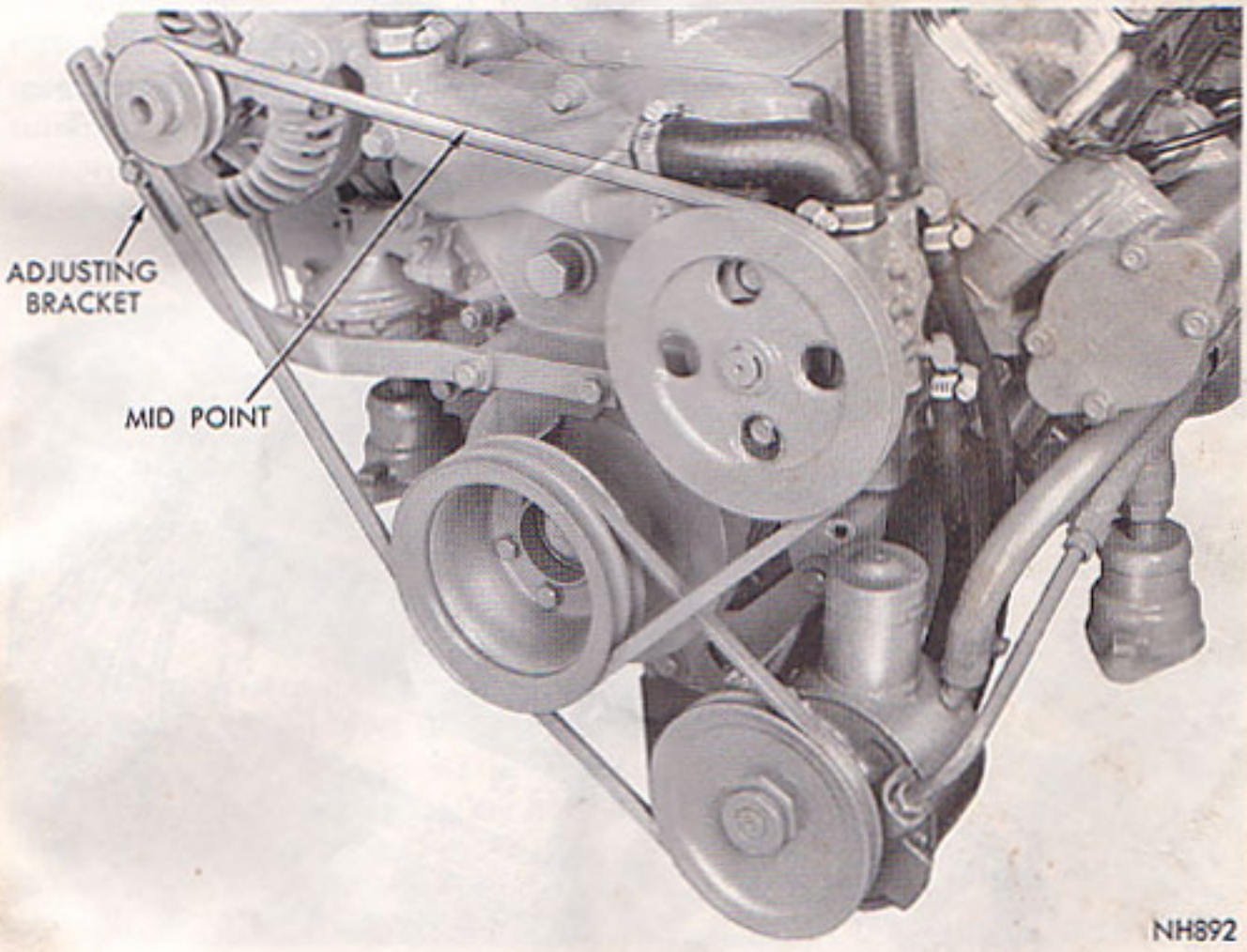


Figure 23—Belt Deflection Method

HYDRAULIC PUMP (If so equipped)

The hydraulic pump mounted on the front end of the engine furnishes the power for the hydraulically operated clutch. Inspect the level of the hydraulic pump reservoir every 25 hours of operation. If necessary, replenish to the bottom of the filler neck, with Automotive Transmission Fluid, Type "A", Suffix "A".

ENGINE CRANKCASE VENTILATOR VALVE

All models are equipped with a positive crankcase ventilating system (Fig. 24). The system must be kept clean to maintain good engine performance and durability as deposits will accumulate in the valve, hoses and the carburetor. The system should be inspected every 100 hours and the valve replaced every 250 hours. This service will be required more frequently if the engine is used for short trips or frequent idling.

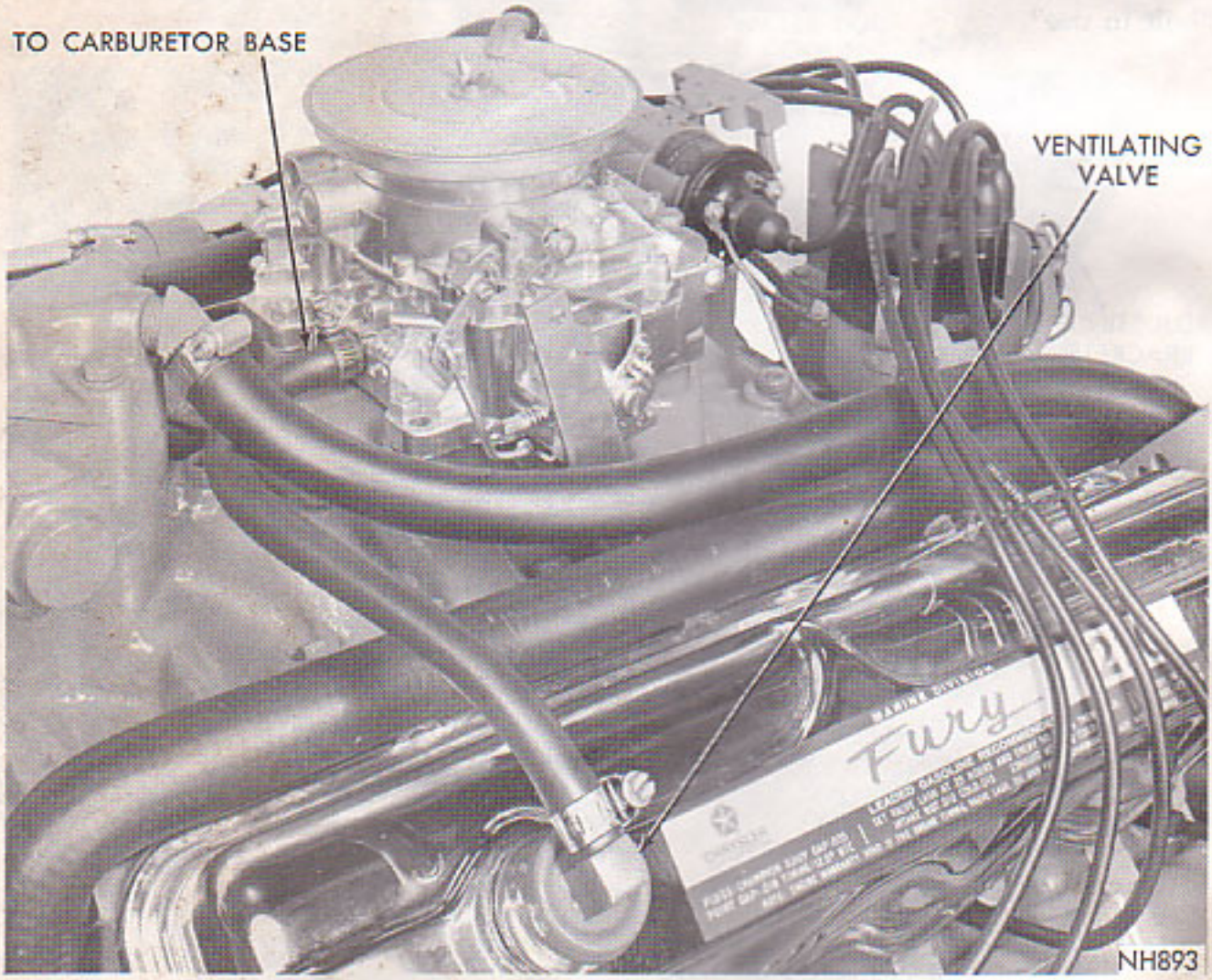


Figure 24—Closed Crankcase Ventilating System

Every 100 hours of operation, with the engine running at idle, remove the ventilation valve and cap assembly from the rocker cover. If the valve is not plugged, a hissing noise will be heard as air passes through the valve and a strong vacuum should be felt when a finger is placed over the valve inlet. Replace the ventilator valve and cap assembly and remove the inlet breather cap. With the engine running at idle, loosely hold a piece of stiff paper over the oil fill pipe. It should be sucked against the oil fill pipe with a holding force. A final test should be made to be certain the valve shuttle is free. A clicking noise should be heard when the valve is shaken (engine not running). If the noise is heard, the unit is satisfactory and no further service is necessary. If the valve does not click when shaken or if the paper is not sucked against the fill pipe, the valve should be replaced. Do not attempt to clean the valve.

The correct valve can be identified as follows:

1. A letter "H" stamped on the end.
2. A valve with a flat end.
3. A valve with a black end washer.

With a new valve installed, if the vacuum can be felt with the engine idling, the system is satisfactory. If the vacuum cannot be felt with a new valve installed, it will be necessary to clean the hose and the passages in the lower part of the carburetor. The carburetor passages should be cleaned by hand turning a ¼" drill in the openings to dislodge solid particles. Blow clean with compressed air. If a ¼" drill appears to be too large, use a smaller drill. It is not necessary to disassemble the carburetor for this service.

FUEL SYSTEM (BBD SERIES CARBURETOR)

Each throat of the dual carburetor (BBD 3212S) used on Models M-318A supplies an air fuel mixture to four specific cylinders. Each throat contains its own idle air bleed, high speed air bleed, idle orifice tube, main vent tube, main metering jet, metering port, idle port, idle mixture adjustment and throttle valve. (Fig. 25.)

The float system maintains a fuel supply at a constant level for all operating conditions. The fuel level is kept at a minimum to prevent as little fuel vaporization as possible and to aid in warm engine starting. The bowl is vented to the inside of the carburetor air horn so that the proper air pressure is maintained in the bowl chamber at all times.

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

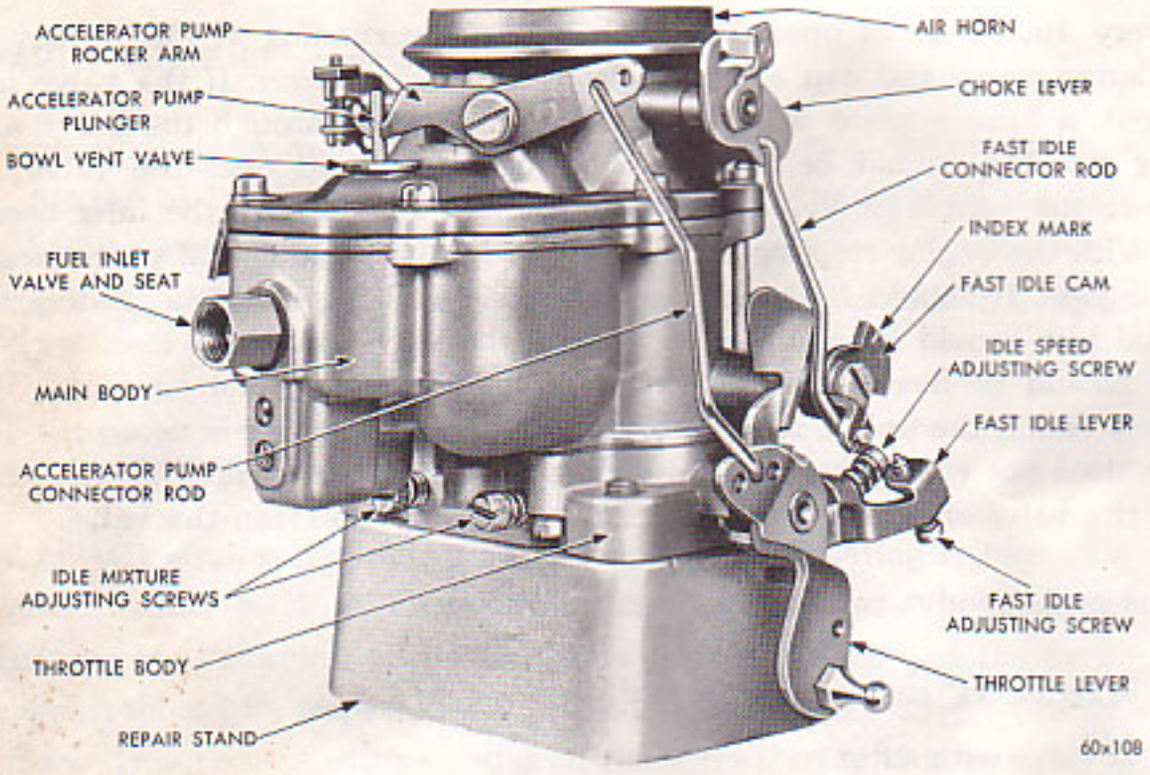


Figure 25—Carburetor Assembly BBD Series Used on Models M-318A

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 bleed adjustment screw port.

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 port. 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.

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 directly proportional to the amount the throttle control is opened. When the throttle control is opened, 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 throttle control 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 accelera-

tor 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.

FUEL SYSTEM (CARTER SERIES YH CARBURETOR)

The Carter carburetor series YH-3195S used on Model M-318C is a low silhouette horizontal-draft carburetor consisting of a cast from throttle body with three-bolt mounting, and the main body incorporates a manual control choke and bowl cover (Figs. 26, 27, 28 and 29).

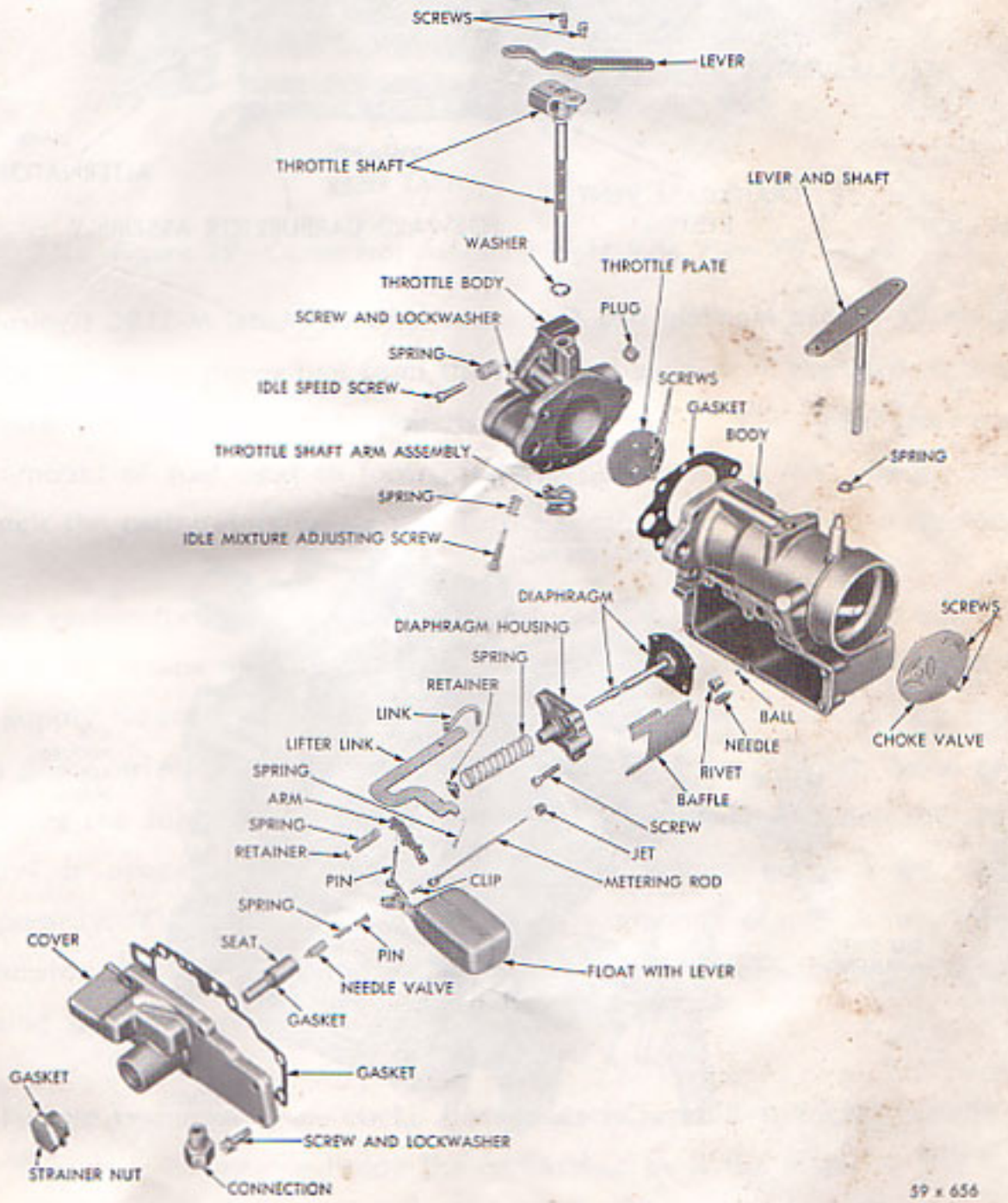


Figure 26—Carburetor YH Series Used on Model M-318C (Disassembled View)

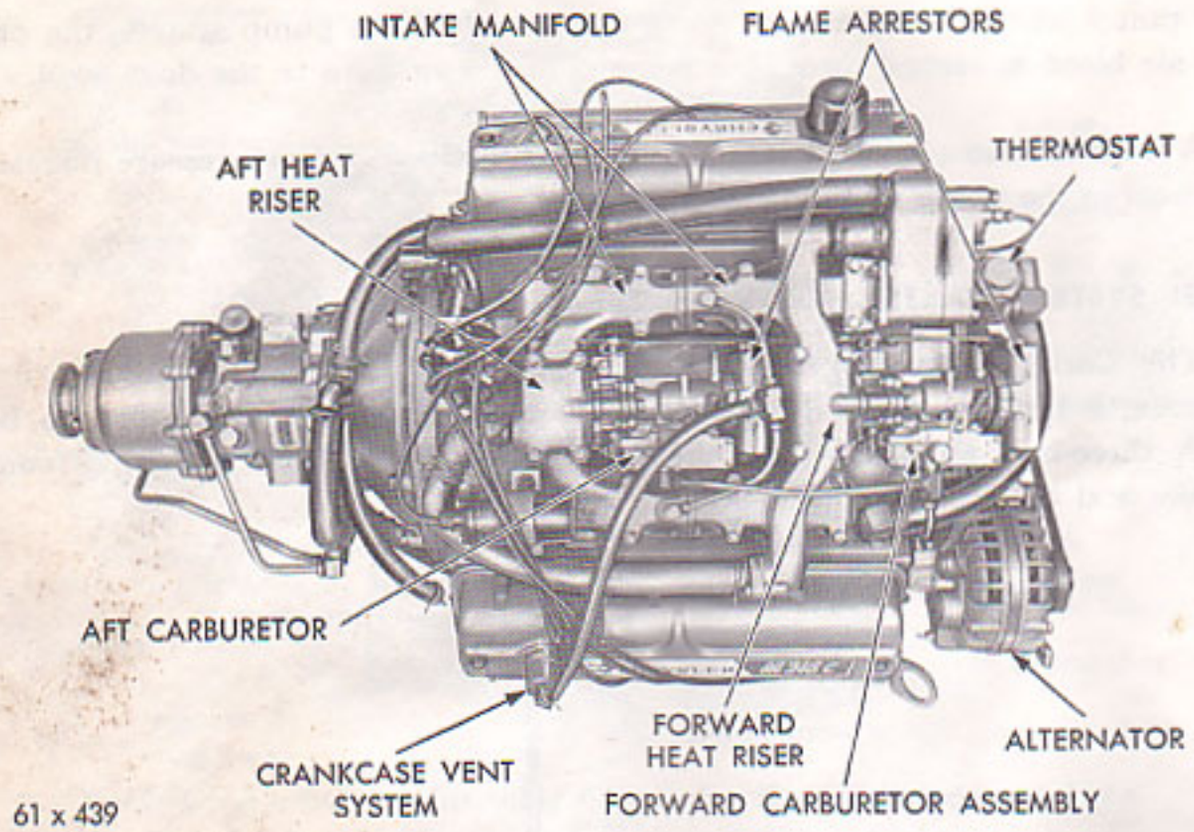


Figure 27—Intake Manifold and Carburetor Installed Model M-318C (Typical)

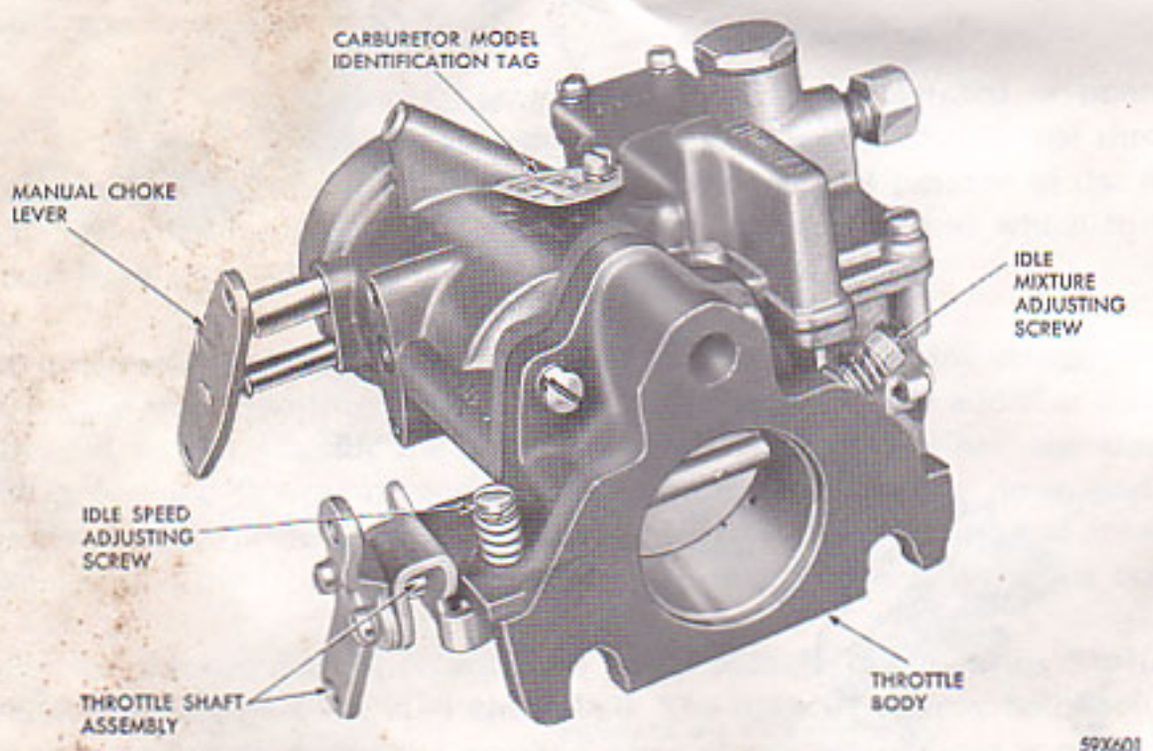


Figure 28—Carburetor Assembly Left Side View YH Series

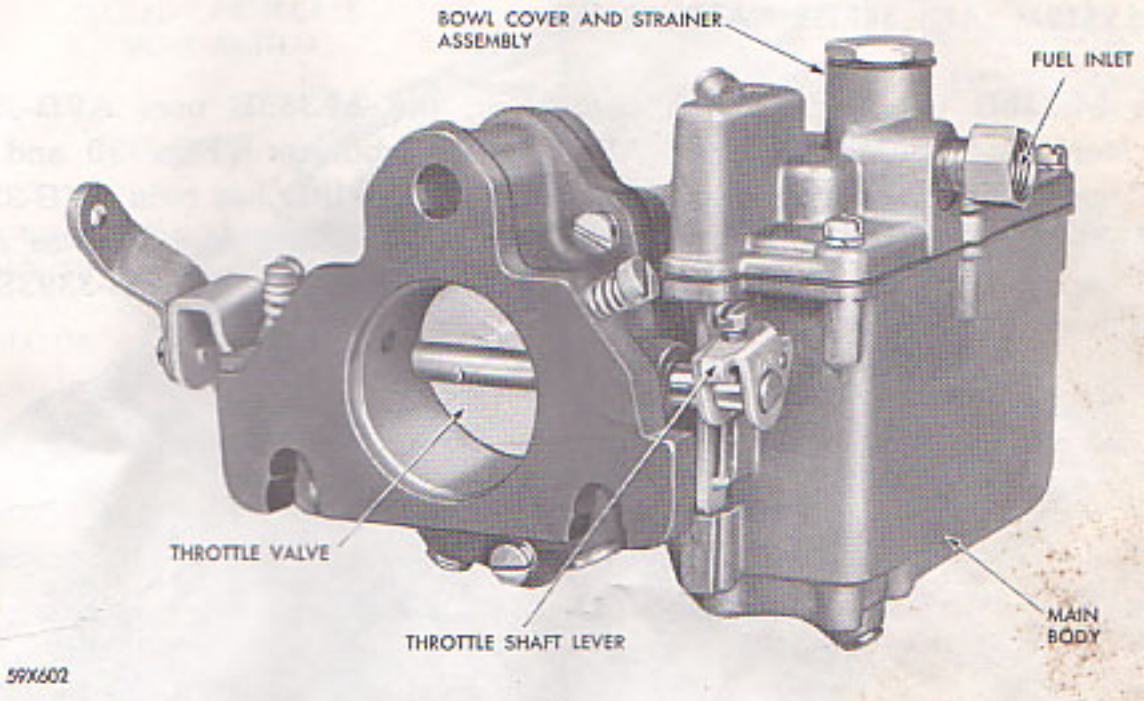


Figure 29—Carburetor Assembly Right Side View YH Series

The fuel pump draws fuel from the tank and sends it to the carburetors at a pressure of from six to seven pounds per square inch. The carburetors control the amount of fuel used to form a combustible mixture with the air rushing through the carburetors on its way to the combustion chambers of the engine.

The carburetors hold a constant supply of liquid fuel which is maintained at level by means of a float system. At engine idle speed, fuel is drawn from this supply through the idle system and is mixed with the air rushing through each flame arrestor and carburetor. Above idle speed, the high speed system furnishes the fuel for the mixture leaving the carburetor. When the throttle control is opened suddenly, the accelerating system enriches the mixture temporarily. The choke system reduces the amount of air drawn into the carburetor, thereby increasing the proportion of fuel necessary for starting and running a cold engine.

The idle system and the choke system are adjustable from the outside. The float system is adjustable inside the carburetor, as is the metering rod height. Once the carburetors are properly adjusted, they require no maintenance or adjustment between fitting out and lay-up.

FUEL SYSTEM (AFB SERIES CARBURETOR)

The M-318B uses AFB-3213S carburetor, the M-383B uses AFB-3543S carburetor and the M-413B uses AFB-3543S carburetor (Figs. 30 and 31) with Coast Guard approved flame arrestors. The M-413D has twin AFB-3393S and AFB-3564S carburetors (Fig. 32). The M-413E and M-426B use AFB-3543S carburetor, and the M-426D and M-426SKI uses twin AFB-3393S and AFB-3564S carburetors.

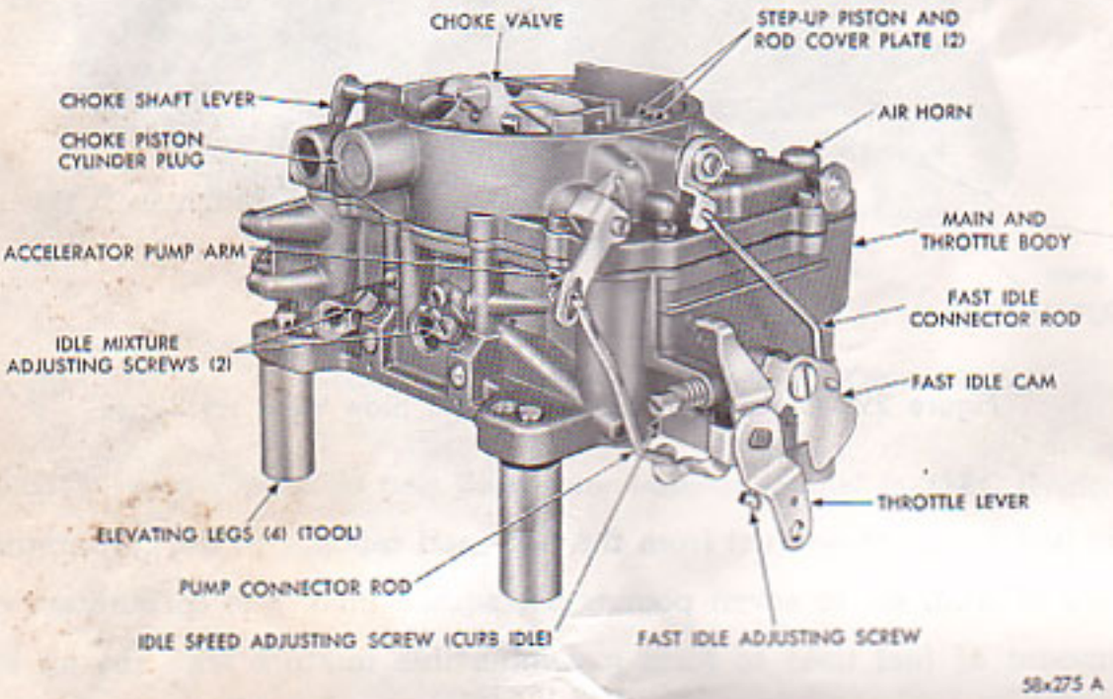


Figure 30—Carburetor Assembly Right Side View Models M-318B, M-383B, M-413, M-426

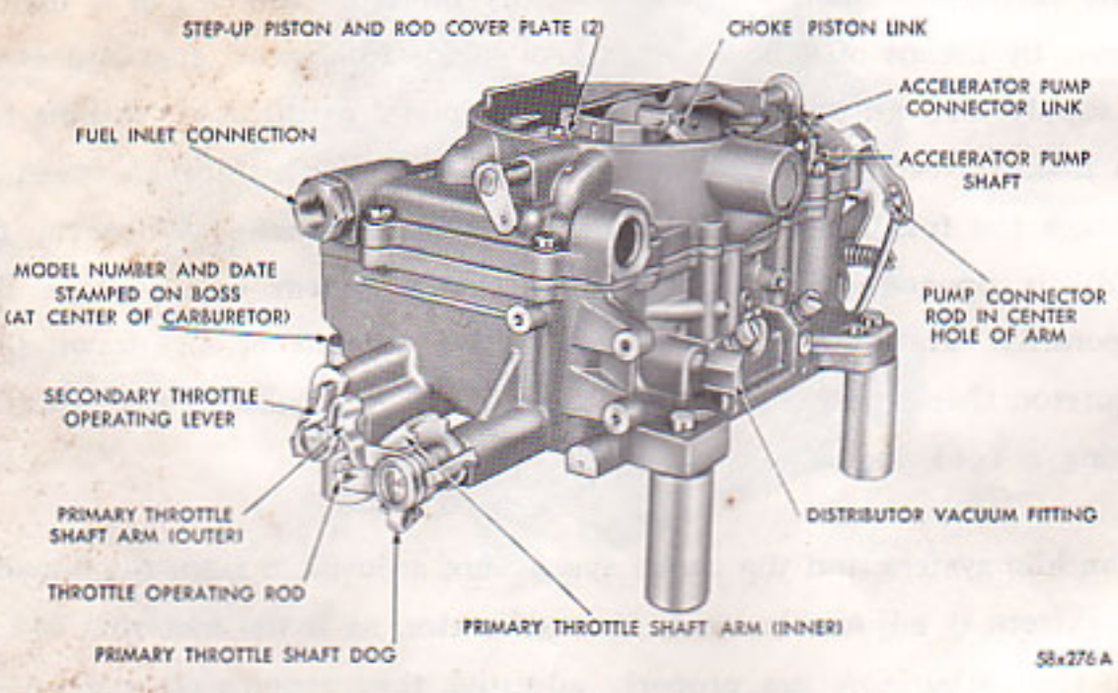


Figure 31—Carburetor Assembly Left Side View M-318B, M-383B, M-413, M-426

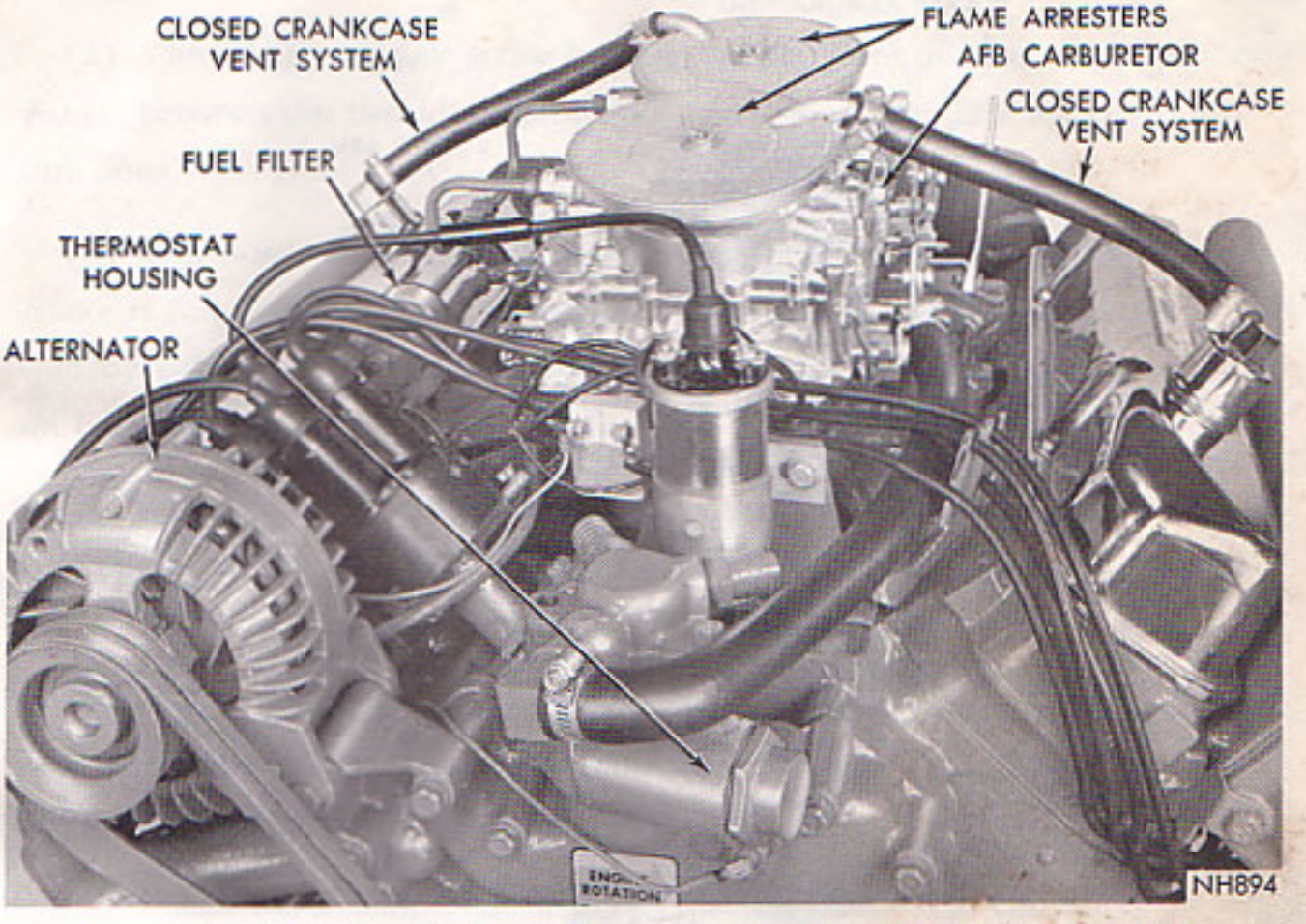


Figure 32—Intake Manifold and Carburetor Assembly Installed Models 426D

The diaphragm type fuel pump is operated from an eccentric attached to the camshaft gear. The fuel pump draws fuel from the tanks and delivers it under pressure to the carburetor (Fig. 33).

The AFB (aluminum four barrel) carburetor contains step-up rods, pistons and springs accessible for service without removing the air horn, or the carburetor from the engine.

The venturi assemblies (primary and secondary) are replaceable and contain many of the calibration points for both the high and low speed system. One fuel bowl feeds both the primary and secondary nozzles on the right side while the other fuel bowl takes care of the primary and secondary nozzles on the left side. This provides improved performance during abrupt turns, quick stops and acceleration.

All the major castings of the carburetor are aluminum, with the throttle body cast integral with the main body. This allows an overall height reduction in the carburetor. The section containing the accelerator pump is termed the primary side of the carburetor. The rear section is the secondary.

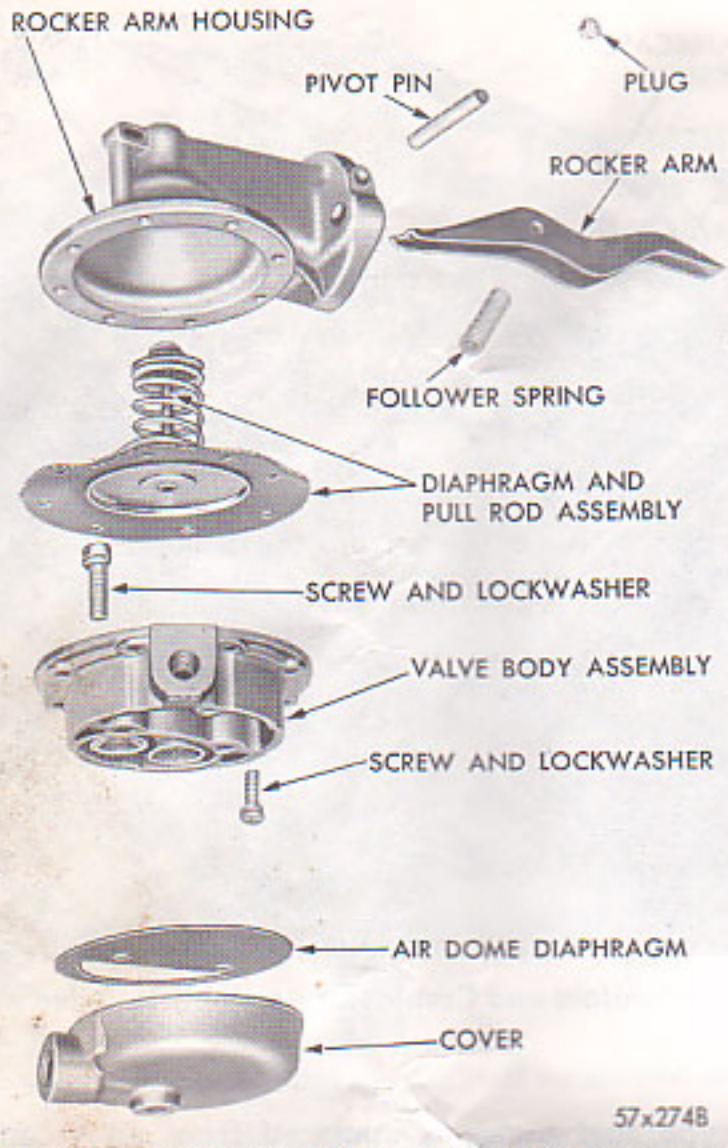


Figure 33—Fuel Pump (Disassembled View) (All Models)

The five conventional systems are two float systems, two low speed systems (primary side only), two high speed systems, one accelerator pump system and one automatic choke control system.

Idle Speed and Throttle Linkage Adjustment

Idle Speed Adjustment

(1) Remove the inter-connecting rod at the rear carburetor throttle lever. Disconnect the throttle control at the rear carburetor.

(2) *Lightly* seat the idle mixture screws, then turn the idle mixture screws from 1 to 2 turns open, equal on all four adjustments.

(3) The idle by-pass air screw is located at the front of each carburetor body flange, between the two idle mixture screws, then set the idle by-pass screws 1 turn open.

(4) Warm-up the engine to normal operating temperature. Be sure the choke is fully open and that the engine is at idle. Adjust the idle speed to 650 rpm by opening or closing the by-pass screws, keeping the adjustments equal on both carburetors.

(5) Adjust the idle mixture screws on the front carburetor for maximum rpm, then adjust the rear carburetor and readjust the front carburetor if necessary.

(6) Install the inter-connecting rod and connect the throttle control at the rear carburetor. Should the idle speed exceed 675 rpm, the idle by-pass screws should be readjusted to 650 rpm.

(7) Check the manual control to see that they allow the carburetor to open to the full throttle.

Throttle Linkage Adjustment (Fig. 34)

Make sure that the following adjustments are correct as the incorrect adjustment of the throttle linkage can produce a loss of rpm's.

(1) Hold the rear carburetor throttle in the wide open position. (Choke in the off position.)

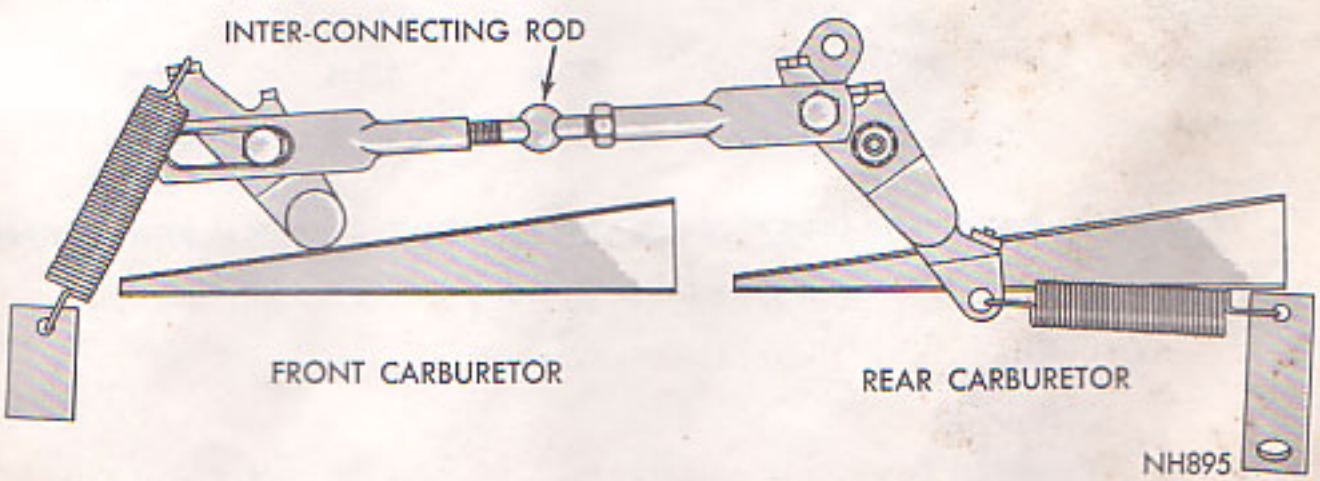


Figure 34—Throttle Linkage Adjustment

"M" SERIES ENGINE FUEL RATINGS,

Model Name	Fury 190	Fury 210	Fury 195	Newport 260
Fuel Grade	82 Oct. Minimum (Motor Method)	85 Oct. Minimum (Motor Method)	80 Oct. Minimum (Motor Method)	83 Oct. Minimum (Motor Method)

The V-8 Marine Engines will operate satisfactorily on good quality regular grade fuels. There are differences in the minimum factorily on fuels of better anti-knock quality. The fuel numbers shown are motor method ratings and are not the more com White gasolines of sufficient octane requirements are also satisfactory.

Spark Plug Make	Champion	Champion	Champion	Champion
Model	XJ10Y	XJ10Y	XJ10Y	XJ10Y
Spark Plug Gap	.035 in.	.035 in.	.035 in.	.035 in.
Contact Gap	.014-.019 in.	.014-.019 in.	.014-.019 in.	.014-.019-in.
Ignition Timing	12½° B.T.C.	12½° B.T.C.	12½° B.T.C.	5° B.T.C.

Rotation:

The rotation designation stamped on the engine serial number plate refers to the rotation of the propeller shaft when viewed indicates a Left Hand propeller shaft rotation.

Engine Designation	M-318-A	M-318-B	M-318-C	M-383-B

Tappet Clearance:

Intake	.012 in.	.012 in.	.012 in.	.015 in.
Exhaust	.022 in.	.022 in.	.022 in.	.026 in.

After 25 hours of operation the tappet adjustments should be made with the engine at normal operating temperature.

Battery Polarity

ENGINE ROTATION AND ADJUSTMENTS

Golden Commando 280	Golden Lion 300	Imperial 250	Golden Commando 290	Golden Lion 310	Golden Lion 325	Golden Lion Special
84 Oct. Minimum (Motor Method)	84 Oct. Minimum (Motor Method)	82 Oct. Minimum (Motor Method)	84 Oct. Minimum (Motor Method)	84 Oct. Minimum (Motor Method)	90 Oct. Minimum (Motor Method)	102 Oct. or Higher Minimum (Research Method)

quality fuels that the engines can tolerate and this information is intended as a guide. All M-Series engines will operate satis-
nonly expressed (and higher number) research method ratings with the exception of the Golden Lion Special. So called Marine

Champion	Champion	Champion	Champion	Champion	Champion	Champion
XJ10Y	XJ10Y	XN6	XJ10Y	XJ10Y	XJ10Y	XJ10Y
.035 in.	.035 in.	.035 in.	.035 in.	.035 in.	.035 in.	.035 in.
.014-.019 in.	.014-.019 in.	.014-.019 in.	.014-.019 in.	.014-.019 in.	.014-.019 in.	.014-.019 in.
5° B.T.C.	5° B.T.C.	10° B.T.C.	7½ ° B.T.C.	7½° B.T.C.	5° B.T.C.	10° B.T.C.

from the stern looking towards the engine. The letter "R" indicates a Right Hand propeller shaft rotation; the letter "L"

M-413-B	M-413-D	M-413-E	M-426-B	M-426-D	M-426-D	M-426-SKI
.015 in.	.015 in.	.015 in.	.015 in.	.015 in.	.015 in.	.015 in.
.026 in.	.026 in.	.026 in.	.026 in.	.026 in.	.026 in.	.026 in.

Adjustments at 50 hour intervals thereafter will result in the owner having an engine at the peak of operating efficiency.

—Negative Ground Only—

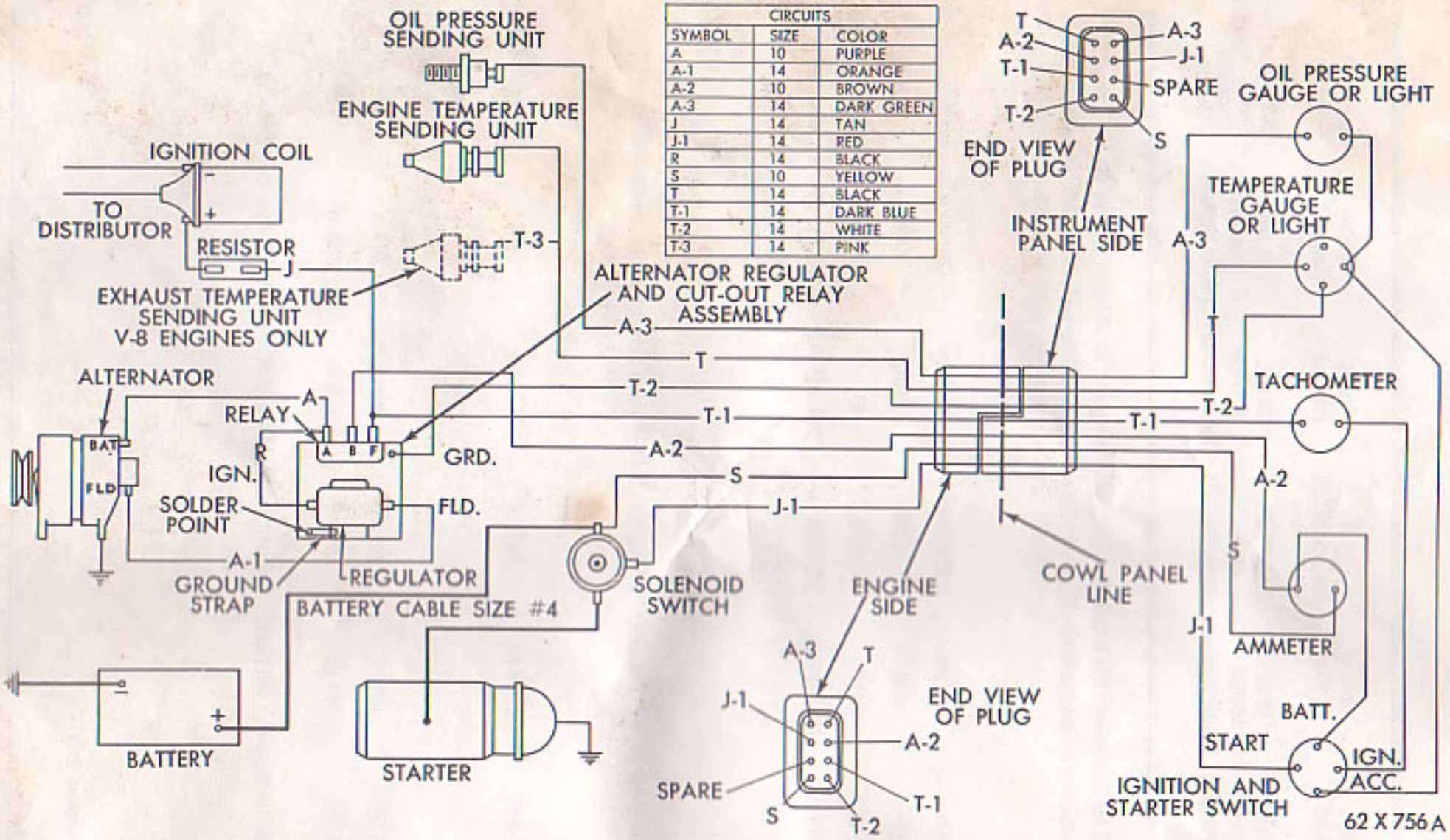


Figure 35—Wiring Diagram 12 Volt System (Negative Ground)

(2) Adjust the inter-connecting rod at the slotted end so the front carburetor throttle valves will also be in the wide open position.

(3) Tighten the locknut and check the operation in the linkage.

(4) Make sure the inter-connecting rod can rotate slightly on the pivots and not bind in any throttle position.

(5) Recheck the manual control to see that they allow the carburetor to open to full throttle.

(6) The adjustments are correct when the front carburetor throttle valves start to open at approximately 1800 rpm's with the boat underway.

ELECTRICAL SYSTEMS (All Models)

The electrical system includes an alternator, voltage regulator, cutout relay, starting motor, starting motor solenoid, ignition distributor, ignition coil, spark plugs together with the necessary cables and connecting wires (Fig. 35).

ALTERNATOR

The alternator (Fig. 36) is fundamentally an alternating current generator

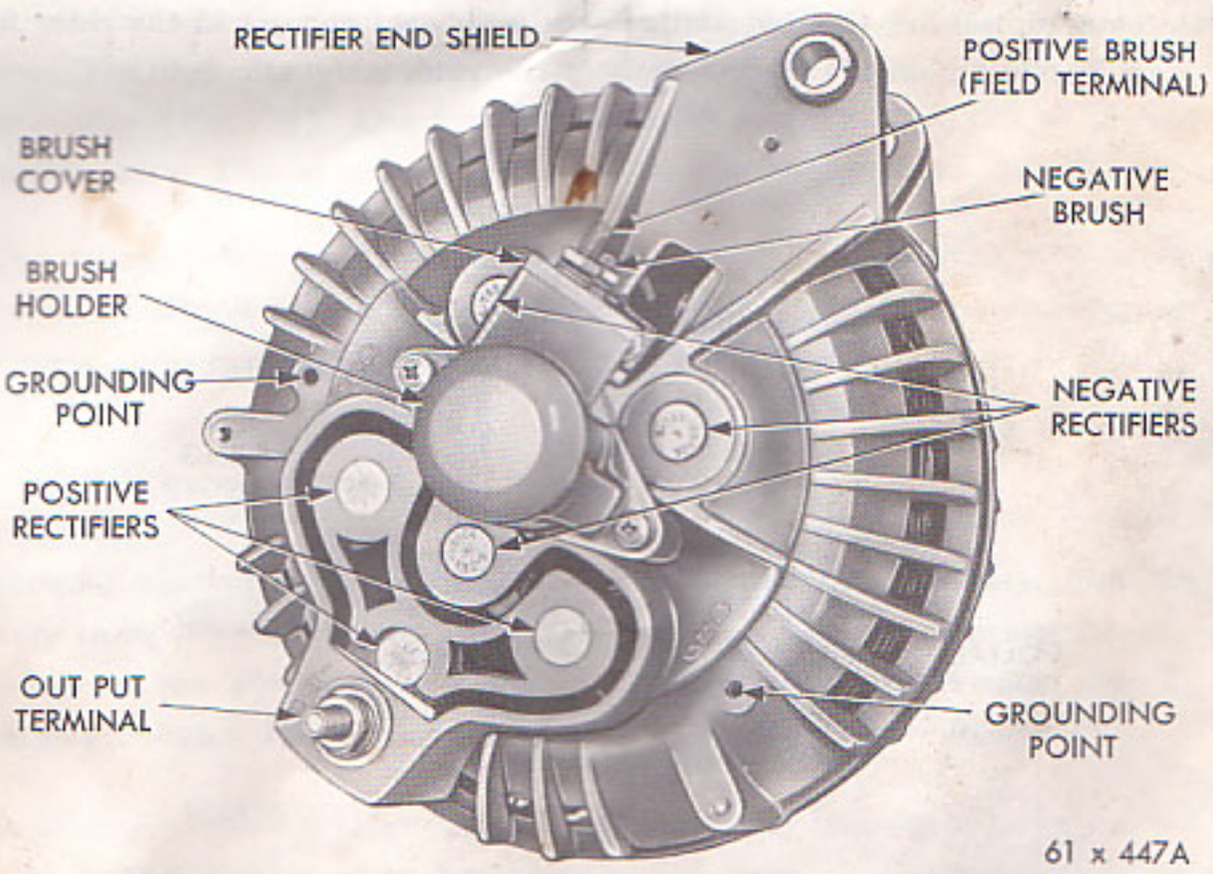


Figure 36—Alternator Assembly (All Models)

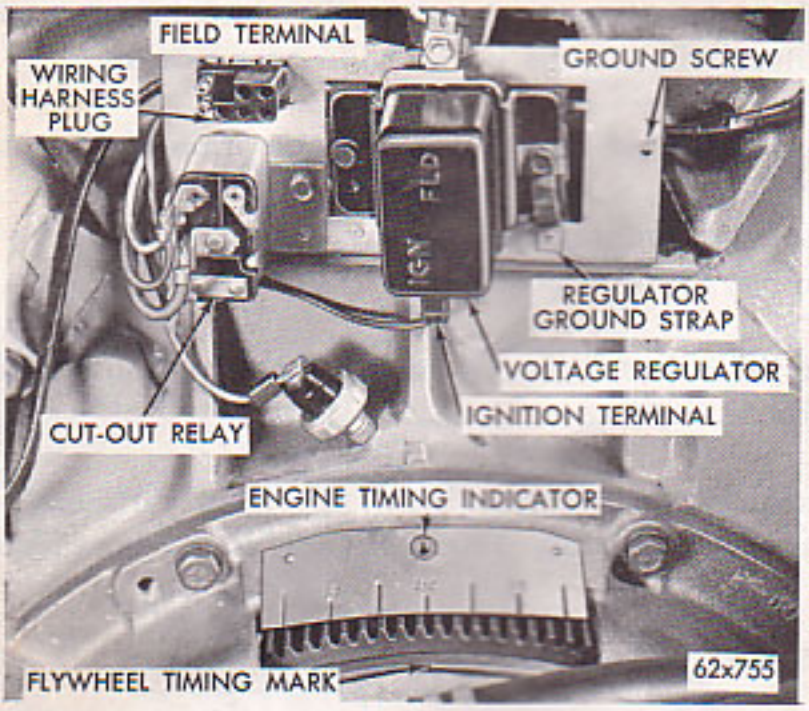


Figure 37—Voltage Regulator Terminal Connection (All Models)

with six built-in silicon rectifiers, that convert the alternation current into direct current, which is available at the output "BAT" terminal.

A regulator (Fig. 37) to limit the direct current voltage output. The 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.

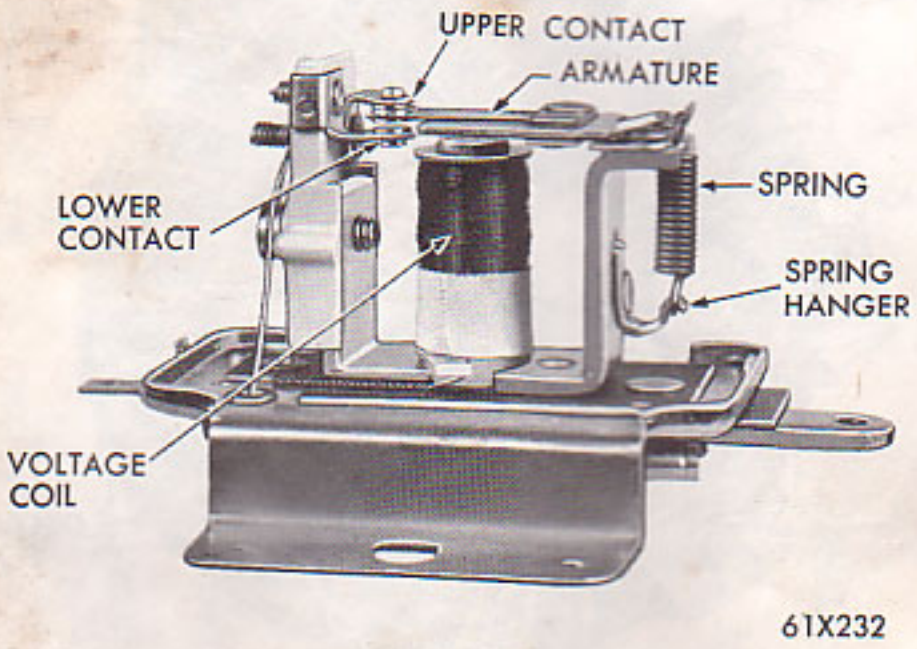


Figure 38—Voltage Regulator (Cover Removed)

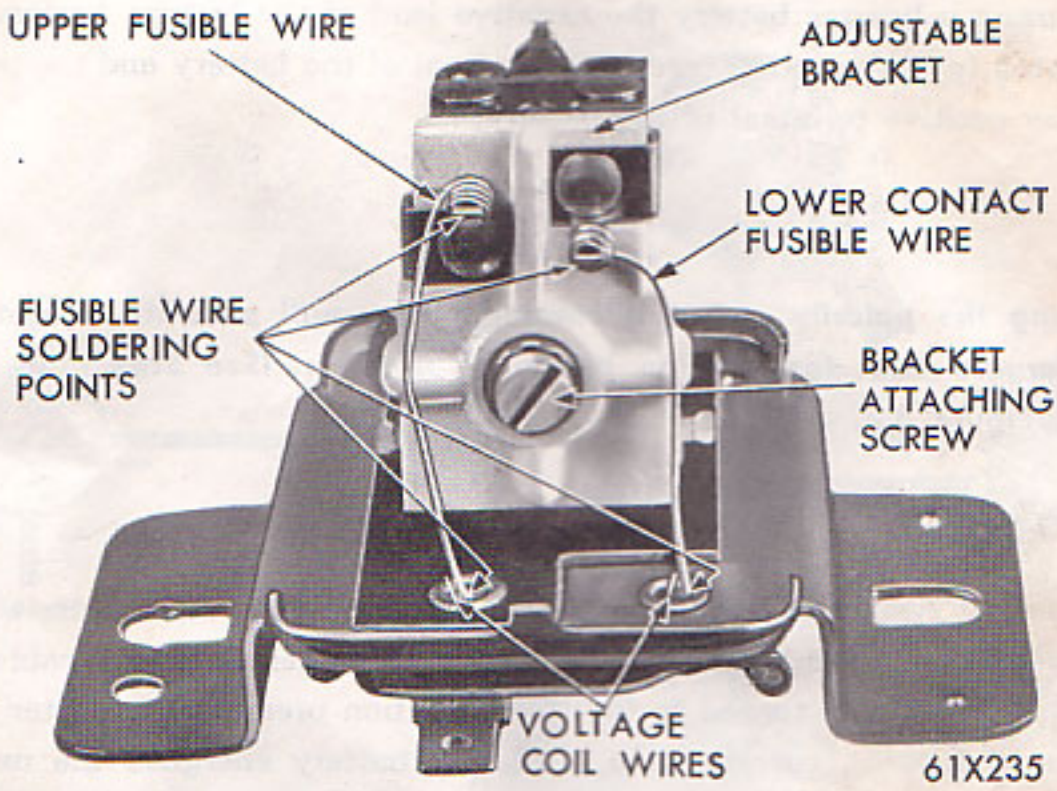


Figure 39—Voltage Regulator Fusible Wire

The voltage regulator has two sets of contacts using a common single armature (Fig. 38). The upper and lower stationary contact 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. 39). The lower contact bracket is connected to ground by a fusible wire. The armature is connected to the insulated "FLD" terminal.

The cutout relay opens the circuit from the battery to the alternator when the ignition circuit is opened, thereby precluding the possibility of damage in the event the alternator becomes shorted due to foreign matter.

WARNING

Extreme caution must be exercised when installing a battery, attaching a battery charger or using a booster battery to start in order to prevent extensive damage to the electrical circuits which can result from reverse polarity or excessive voltage. The entire system is a negative ground circuit only.

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 possibly burn out the wiring harness and damage the alternator rectifiers. (See Schematic Wiring Diagram, Figure 35).

STARTING SYSTEM

The starting system consists of a 12-volt starting motor and starter solenoid switch (actuating switch), and a battery to starter solenoid switch cable. With the ignition switch key turned to the "ON" position pressing the starter button on the control panel, current from a 12 volt battery energizes the magnetic switch in the solenoid closing the circuit from the battery to the starting motor through the battery cables and 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 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. 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.

The ballast resistor is a fixed resistance in the ignition primary circuit. During low speed operation, when the primary circuit current flow is high, the ballast resistor temperature rises, increasing the resistance. This reduces the current flow thereby prolonging ignition point life. When the primary current flow is low, the ballast resistance cools off allowing more current flow, which is required for high speed operation.

An automatic centrifugal advance built into the distributor provides proper ignition timing in relation to engine speed.

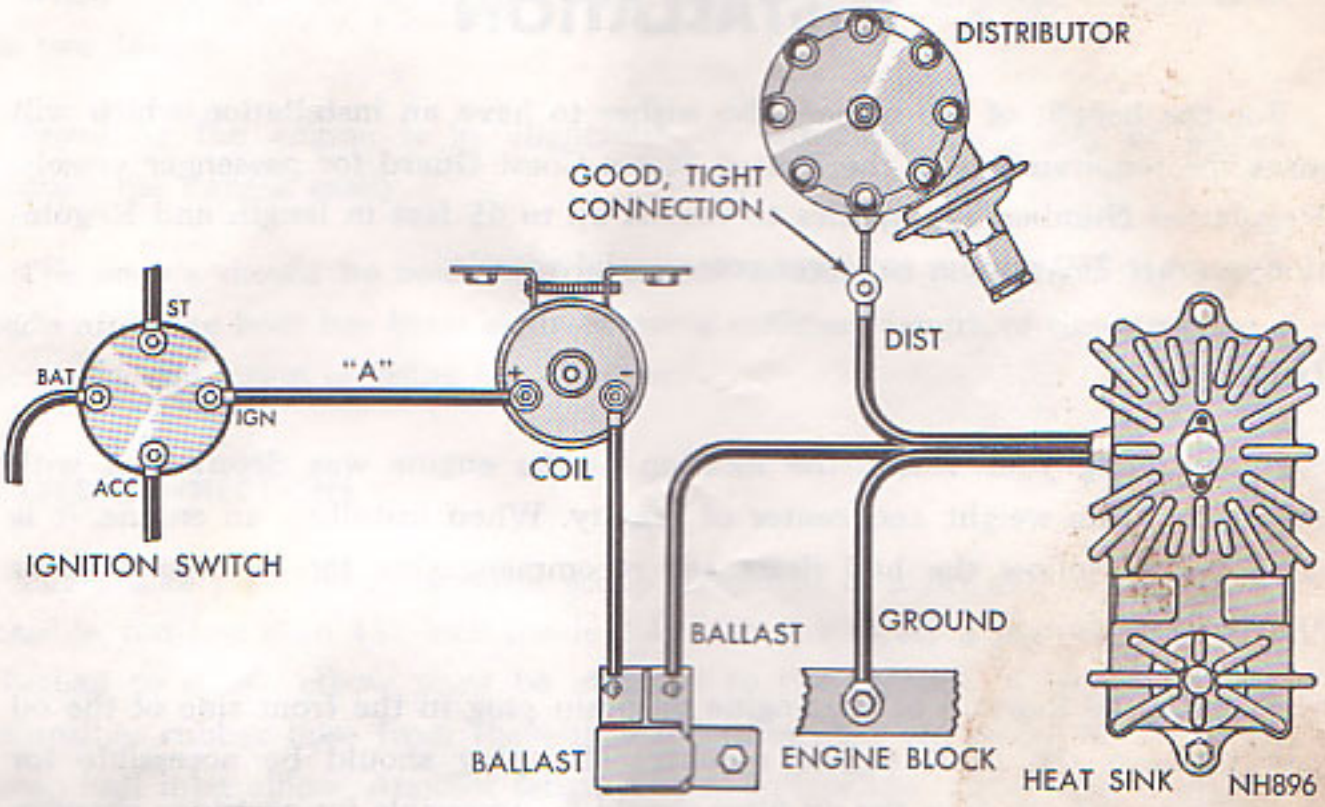


Figure 40—Transigniter Installation (All Models)

TRANSIGNITER (Prestolite) (If so equipped)

The Prestolite Transigniter provides a means of furnishing greater current to the ignition coil, with an accompanying greater secondary voltage for firing the spark plugs, while at the same time requiring less current through the ignition contacts, thereby materially lengthening their life. This is accomplished by means of two inter-related primary ignition circuits (Fig. 40) whereas the conventional system uses only one such circuit (Fig. 35).

INSTALLATION

For the benefit of the owner who wishes to have an installation which will meet the requirements of the United States Coast Guard for passenger vessels, Regulation Number 323 applies to vessels up to 65 feet in length and Regulation number 259 applies to larger commercial vessels.

LOCATION

In designing your vessel, the location of the engine was determined with reference to its weight and center of gravity. When installing an engine, it is advisable to follow the hull designer's recommendation for location of your engine.

Observe the location of the engine oil drain plug in the front side of the oil pan between the front engine mounts. The plug should be accessible for draining engine oil. Also, the oil filter should be accessible for cartridge changes.

The center of gravity is on the machined under-surface of the engine block above the oil pan gasket and the rear of the distributor cap.

ALIGNMENT

After the engine has been properly placed, it is well to scribe the engine beds around the engine supports, before aligning the engine with the propeller shaft.

The coupling flanges on the propeller shaft and the engine must come together parallel within .002 inch. Since the shaft is held in one position, the engine must be shifted from side to side and shimmed up and down to attain proper alignment with the shaft.

A .002 inch feeler gauge is used between the flanges in position corresponding to 12-6 and 3-9 o'clock. Hold the feeler gauge against the engine flange in 12 o'clock position, pull the propeller shaft assembly into contact with the gauge sufficiently to produce a slight drag when withdrawing the gauge. Hold the shaft in this position and insert the gauge from the six o'clock position. A difference in the feel in these two positions indicates that the front or rear engine supports need shims. A difference in feel in the 9 and 3 o'clock positions of the feeler gauge denotes that the engine should be shifted from side to side, either at front or rear.

When a uniform feel is attained with the feeler gauge, align the bolt holes in the two flanges.

Providing the engine is in alignment, the attaching bolts can be pulled through the flanges easily.

The engine should be bolted to the engine bed and a final alignment check made after the boat has been in the water a sufficient length of time to relieve the stress and strain of being out of water.

WATER CONNECTIONS

The intake pipe from the water scoop should be as short and as straight as possible, not less than 1¼ inch inside diameter. For safety a seacock should be attached to it. An elbow must be attached to the seacock. A length of non-collapsible rubber hose from the elbow furnishes cold sea water to the water pump hull inlet elbow. Another length of non-collapsible rubber hose from the thermostat housing by-pass connects to the by-pass inlet on the forward section of the water pump hull inlet elbow.

EXHAUST SYSTEM

The engines are equipped for a wet exhaust system. In fabricating the exhaust system, the following precautions should be observed: To avoid entry of water into the engine, the exhaust pipe at the transom flange must be a minimum of six (6) inches below the exhaust manifold outlet (or 6 inches below the high point of the riser when exhaust risers are used). In addition, the exhaust pipe must have a continuous fall of at least ½ inch per foot, with no pockets or sharp bends. Back pressure at the manifold outlet must never exceed 3½ psi. The exhaust pipe should be at least 2½ inches inside diameter and in case of a single exhaust 3½ inches. A flexible coupling should be used as close to the manifolds as practical to absorb vibration with the entire system supported in a manner that will not add weight to the manifold elbows. Curves in the system should be as gradual as possible and never as much as 90°.

FUEL TANK CONNECTIONS

The fuel tank may be located either above or below the level of the fuel pump intake connection. In any case, the fuel line outlet connection should be in the top of the tank. It is preferable to have shut-off cocks and flexible fuel hoses

at both ends of a fuel line. The fuel pump is tapped for a ⅛ inch pipe tap connection.

ENGINE CONTROLS

Sturdy throttle, choke and reverse gear controls should be used with adequate linkage or cables to assure positive control of the engine.

Throttle controls should be adjusted to hold the idle speed set screw against its stop when the control lever is at the "off" position. The control should have sufficient range to move the throttle lever into contact with its wide-open stop.

Choke controls should be adjusted to hold the choke valve closed when the control is at the "on" position and have sufficient range to move the choke to the full "off" position at the time the control reaches its limit of travel. With the control in the "choke off" position, choke valve should be nearly horizontal. It may be necessary to adjust the length of the rod which connects the choke lever.

The reverse gear control should have sufficient travel to provide full travel of the valve control lever from the "ahead" position to the "reverse" position. Since all three valve lever positions are held in position by spring-loaded detents, there is a definite feel as the lever moves into any of the three positions.

CHRYSLER MAINTENANCE MANUAL

The Chrysler Marine Engine V-8 Maintenance Service Manual contains diagrams and a section dealing with installation in addition to all service procedures, laying up and fitting out. The service manual is available under Part Number 81-770-7522 and a Supplement Manual is available under Part Number 81-770-7549.

OPERATING INSTRUCTIONS

Always ventilate the vessel and examine the bilge for leaks every day. Make a visual inspection of the fuel system and the cooling system during this inspection. Check the engine oil level indicator (dip stick) (Fig. 41) and the reverse gear dipstick on the filler cap. Oil levels should be maintained between the marks on the dipsticks.

PREPARATION OF A NEW OR REBUILT 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 Engine Oil. After 25 hours of operation the crankcase may be drained and refilled with oil as recommended in the Lubrication Section.

Cooling System

Be sure that the sea cocks are opened before starting the engine.

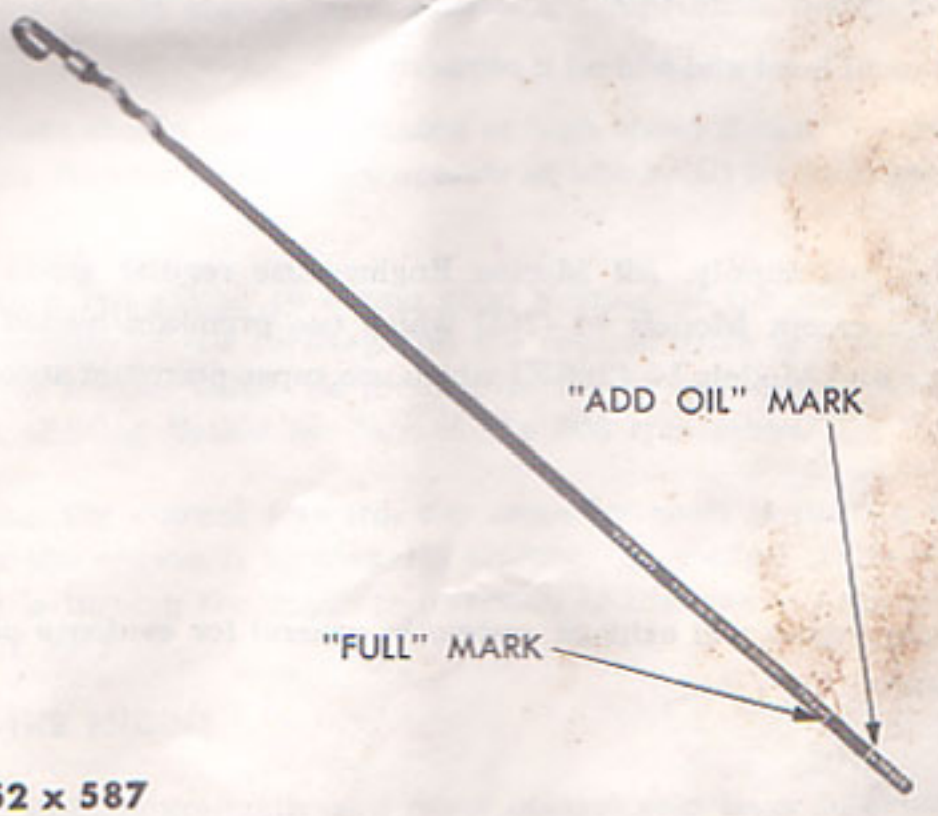


Figure 41—Engine Oil Level Indicator (Dipstick)

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 in the battery.

Electrical Connections

See that all electrical connections are tight and clean. Check each spark plug and tighten to a 30 foot-pounds torque. Check the battery for sufficient electrolyte solution.

Attaching Parts

See that all nuts, bolts and screws that attach parts are secure.

PRESTARTING INSTRUCTIONS

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

Engine Oil Level

Inspect the oil level and add oil if required.

Fuel

Check the fuel supply. All Marine Engines use regular grade automotive type gasoline, except Models M-426D which use premium leaded automotive type gasoline and Models M-426SKI which use super premium automotive type gasoline.

Leaks

Inspect the engine and exhaust system in general for evidence of fuel, oil or water leakage.

Drain Plugs

Make sure all water drain plugs are closed.

STARTING THE ENGINE

1. Place gear control lever in neutral position.

2. Place choke control in full "on" position.

3. Set throttle control approximately one-third open.

4. Turn ignition switch on.

5. Press starter switch until engine starts, but not longer than fifteen seconds at a time.

6. As soon as the engine starts, release the choke, to the position which allows the engine to run smoothly.

7. Adjust throttle to produce a tachometer reading of 750-850 rpm.

8. Observe oil pressure gauge. Reading should be more than one-half the gauge capacity.

9. Check cooling system. Water should discharge from the exhaust pipe almost immediately, changing the sound of the exhaust.

10. Release the choke as the engine warms up. The throttle control may require re-setting also.

11. Operate the engine until the temperature indicator registers approximately 140° F. before casting off.

The engine should always be at operating temperature before getting under way.

New engines should not be operated at high speed during the first fifteen to twenty hours. Neither should they operate at idle speed for long periods of time when new.

Do not race the engine to obtain good shifting, as the transmission is such that the operation of the forward and the reverse drive is very easy with the moving of the control valve. To prolong the life of the engine transmission and of the boat, shifting should be done in the 800 rpm range.

By shifting the control forward, the propeller shaft is turning in the same direction as the engine is turning. By shifting the control in reverse, the propeller shaft is turning the opposite direction of the engine rotation, except on the 1.9 to 1 gear.

STOPPING THE ENGINE

Close the throttle gradually and move control gear lever in neutral position. Allow engine to run at idling speed for approximately fifteen to twenty seconds. Then, with throttle closed, turn off the ignition.

OIL PRESSURE

With engine turning at 2000 revolutions per minute and water at normal operating temperature, oil pressure is maintained at 45 to 65 pounds, providing there is no unusual escape of oil from some point in the system. As bearings wear and increased clearance allows more than the normal amount of oil to escape, the pressure shown on the gauge will be lower particularly at idling speed. When a sudden drop in regulated oil pressure should occur, check the oil level in engine crankcase and add oil if necessary. If this pressure drops to 35 pounds at operating speeds, the filter element may be plugged and should be changed.

WATER TEMPERATURES

The thermostats will automatically maintain the water temperature of the cooling system between 130 and 140 degrees. If the water temperature exceeds 160 degrees, stop the engine and investigate the water circulation system.

GENERAL PRECAUTIONS

Always be sure that the engine compartment is ventilated adequately. Air is just as important as gasoline in the operation of an internal combustion engine.

Never cast off until the engine has reached normal operating temperature and is running smoothly.

After a hard run, let the engine idle for a few minutes before turning off the ignition. This will prevent the engine from kicking back and drawing in vapors from the exhaust.

In cool or wet weather, keep the fuel tank as full as possible at all times. This prevents the entry of moisture-laden air and helps to keep condensation out of the fuel system.

Make frequent checks on the instruments and gauges while operating the engine. Trouble is indicated beforehand by unusual readings. In most instances, proper interpretation of the gauges, together with prompt action in making some slight adjustment or tightening up, will forestall difficulty. It is not advisable to wait until something happens to the engine before taking the necessary steps to correct the situation.

EXHAUST SYSTEM

The exhaust manifolds require no maintenance or adjustment other than inspection occasionally to determine if any leaks have developed, particularly beyond the manifold elbows, as a result of vibration, looseness or interference with other parts of the hull.

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. *(See your Chrysler Dealer)*

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 vasoline to the battery terminals after tightening.

Battery Not Fully Charged—Test the electrolyte in the battery. Check battery specific gravity. Check for dead cell. Replace or recharge the battery, as required.

Attempt to turn engine flywheel with a suitable flywheel turning tool to make sure the engine is free, the engine itself may be seized. (See your Chrysler Dealer)

Starter Switch Defective—Replace the 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. (See your Chrysler Dealer)

STARTER TURNS BUT DRIVE PINION DOES NOT ENGAGE

Starter Clutch Slipping—Replace the starter drive.

Broken Teeth on the Flywheel Drive Gear—Replace the flywheel ring gear (see your Chrysler Dealer). Also examine the teeth on the starter drive pinion.

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

SOLENOID PLUNGER VIBRATES BACK AND FORTH WHEN STARTER SWITCH IS ENGAGED

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

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

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

STARTER OPERATES BUT STARTER DRIVE 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—Inspect to see that the nuts that hold the starter on the housing studs are tightened securely. Loose attaching parts will cause misalignment of the starter pinion with the flywheel.

Broken or Chipped Teeth on Flywheel Ring Gear—See your Chrysler Dealer. Also examine the teeth on the starter drive pinion.

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 physically cracked cap, arcing at the distributor cap contacts, burned rotor. If any cable terminals are corroded be sure to clean or replace them. Clean the

distributor cap tower 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. Wires that are loose or that are not inserted all the way in the towers or on the plugs will corrode and increase the resistance as well as cause carbon tracking of the coil or distributor cap towers.

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 has reached the contact surfaces and contacts should be replaced. Excessive pitting can be due to too small a contact gap, high primary voltage or wrong condenser capacity. Correct condenser capacity is .25 to .285 microfarad. Remove rotor and wipe all the old grease from surface of breaker cam. Apply a light film of new distributor cam grease Mopar Part Number 1473595 on breaker cam only. Do not over-lubricate. Keep oil and grease away from *the contact points.* The contact gap should be .014 to .019 inch, check breaker spring tension—17 to 21.5 ounces. See "Adjustments."

Fouled Spark Plugs—Caused by an over-rich carburetor adjustment—Adjust carburetor. 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.

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.

Improper Timing—Refer to "Distributor Timing."

Dirt or Water in the Fuel Line or Carburetor.

Carburetor Flooded.

Incorrect Float Level Setting

Faulty Fuel Pump.

ENGINE STOPS

1. No fuel reaches engine.
2. Broken connections or corroded contacts in ignition circuit.
3. Propeller fouled.
4. Engine seized from overheating due to lack of oil or coolant.

CONTINUOUS MISFIRING

1. Fouled spark plug.
2. Cracked distributor cap, broken or loose ignition wiring.
3. Low compression. See your Chrysler Dealer.

INTERMITTENT MISFIRING

1. Loose connections in ignition system.
2. Intermittent fuel flow, water in system, worn fuel pump.
3. Low compression.

ENGINE BACKFIRES

1. Spark plug cables improperly installed.
2. Intermittent fuel supply, dirt or water in system.
3. Stuck intake valve.

ENGINE KNOCKS OR PINGS

(Most noticeable on quick acceleration or at full throttle.)

1. Low octane fuel.
2. Excess deposits in combustion chambers.
3. Overheated engine.
4. Incorrect spark plugs.
5. Ignition timing advanced too far.

POUNDING - VIBRATING

1. Loose engine mounts.
2. Engine overheated.
3. Worn engine bearings.
4. Bent propeller or shaft.

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 ⅕ 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.

Engine Flooded

If the spark plugs are wet, this indicates the choke has been used too long. Push the choke button in, open the throttle fully and press the starter button.

MAINTENANCE AND LUBRICATION

The satisfaction an owner receives in the day-to-day operation of his Chrysler Marine engine stems, not only from the inherent dependability and reliability built into the engine but also from the good maintenance he has provided through out its long life.

Maintenance of the Marine engine is simple. Basically it consists of only two items: cleanliness and lubrication. Internal cleanliness is fostered and preserved by changing oil and oil filters at regular intervals. External cleanliness is just as simple.

Other maintenance services, such as engine tune-up will be required. The intervals, however, will be determined by the conditions under which the engine is operated. These items are litsed here, simply as a reminder, also, these items usually require the use of delicate instruments, gauges and special tools. Since the owner would have little use for such equipment, we recommend that the Chrysler Marine dealer be consulted regularly for inspection and diagnosis.

Use a good grade engine oil from a reputable refiner which is labeled for "Service MS." Additional labels reading "SAE 30" designate the viscosity of the oil which should be used when the anticipated atmospheric temperature will be above 32° F. Use SAE 20W in temperatures below 32° F.

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.

The oil should be kept as clean as possible and should be renewed when contaminated excessively to perform the above functions properly. The oil added to the engine at the factory, originally, should be retained for the first 25 hours of operation, then removed and replaced with an oil designated for "Service MS" of the proper viscosity. If it becomes necessary to add oil during this initial period, an oil "For Service MS" of the proper grade for the anticipated temperature should be used. Periodic oil changes, thereafter, using the proper grade for the anticipated temperature range and designated "For Service MS" should be made every 50 hours or two months, whichever occurs first.

The engine room log, inside the back cover of this book, has been filled in to

illustrate a method of recording the different operational hours and the out-of-use time. Any recommendation must be tempered with the best judgments of the owner.

The full flow oil filter will trap any non-fluid particles which are in suspension in the engine.

The filter has a safety valve which permits some oil to circulate in the case when the filter becomes clogged with foreign matter. When this occurs, a concentrated solution of waste enters the lubricating system.

Engine oil should be changed immediately after a run of sufficient duration to bring all parts of the engine to full operating temperature. The oil filter should be changed every second oil change.

Used motor oil can be removed from the engine, either by gravity or by suction. The gravity flow method makes use of the drain plug in the lowest portion of the oil pan, on the front side. By using this opening, all of the oil can be removed. In the limited space in most pleasure craft, there is little room for a catch basin under this point. In such cases, a permanent fitting and short extension at this point, could be used in conjunction with a suction pump to remove all of the used oil.

A suction pump can be used thru the large (1 inch) opening in the right side of the oil pan. With a minimum of care, the suction hose can be guided to the low spot in the pan. When the construction of the hull prohibits the use of this opening in the pan, a plastic hose of ¼ inch diameter can be inserted in the dip-stick tube. With care, the hose can be guided and twisted in the direction of the lowest portion of the pan. Use the dip stick tube only when it is impossible to reach other openings.

Unscrew the oil filter from the base and discard (Fig. 42). 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 (Fig. 41).

FLAME ARRESTER (Every 100 Hours)

Remove the screws which attach the flame arrester to the carburetor air horn and remove the flame arrester. Wash in a dry cleaning solvent and dry thoroughly before installing.

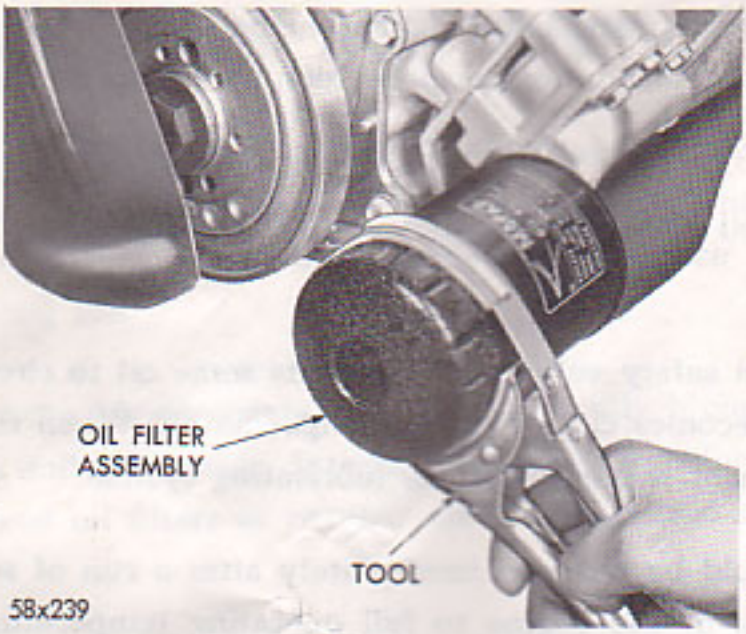


Figure 42—Engine Oil Filter (Throw Away) (Typical)

DISTRIBUTOR

The distributor has two lubricating points (Fig. 43). On the side of the distributor, there is an oil cup. There is a wick in the center of the cam. Add five drops of SAE 30 engine oil to the oil cup each 25 hours of operation. Add two or three drops of SAE 10 engine oil to the wick each 250 hours of operation.

CAUTION

DO NOT allow oil or grease on or near the breaker points.

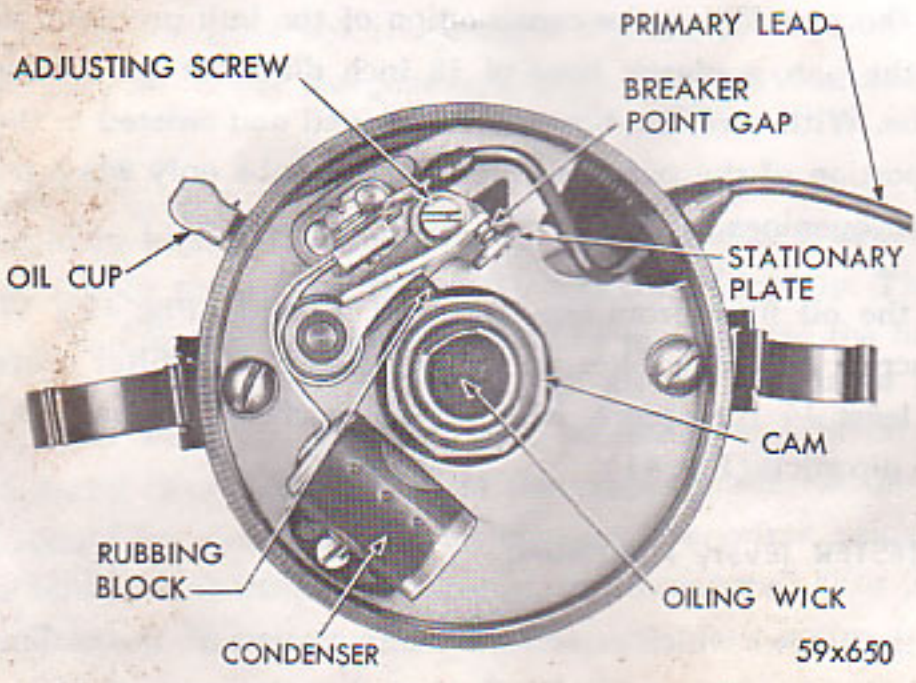


Figure 43—Distributor Lubrication Points

MAINTENANCE SCHEDULE

DAILY

While the hull is opened for ventilation and before starting the engine:

1. Examine the bilge for evidence of leaks. Remove any accumulation. Examine propeller shaft packing gland for leak.

2. Examine fuel tank and lines for leaks or loose connections. Note any fuel requirements.

3. Examine all water connections for leaks. Check the sea cocks for proper operation.

4. Check the level of the oil in the engine and in the reverse gear. Bring up to level if necessary, using the same viscosity lubricants as those presently in use.

5. Start the engine and examine the fuel lines from the fuel pump to the carburetors for leaks resulting from pressure. Also, examine the cooling system for pressure leaks.

AFTER 25 HOURS OF OPERATION OR TWICE A MONTH

In addition to performing the daily maintenance, also perform the following:

1. Add 5 drops of SAE 30 engine oil to the distributor oil cup. Remove the rotor every 250 hours and place two or three drops of light engine oil on felt wick in top of cam.

Check the level of the hydraulic pump reservoir. If necessary, replenish to the bottom of the filler neck with Automotive Transmission Fluid, Type "A," Suffix "A."

CAUTION

Be sure no oil or grease is on the contact points.

2. Lubricate each joint of all linkages to the throttle, choke, reverse gear and steering as necessary for easy operation from the helmsman's position.

3. Check valve tappet settings. After first 25 hours and thereafter at 50 hour intervals.

AFTER 50 HOURS OF OPERATION OR ONCE EACH MONTH

In addition to performing the Daily and the 25 Hour items, also perform the following:

1. Change the engine oil.

2. Change the engine oil filter. (Every 100 hours of operation.)

3. Check the condition of the battery. Check gravity and temperature of the electrolyte. If the temperature-corrected gravity reading is below 1220, the battery should be recharged. If the gravity reading is over 1260, the voltage regulator should be adjusted by a Chrysler Marine Engine Dealer. Also, clean the battery terminal connections if necessary. Check hold-down brackets for tightness.

4. Remove, disassemble and clean flame arrestors. Flame arrestors must be dry when reassembled and installed.

In addition to the above schedules, certain operations which cannot be scheduled, should be analyzed by the Chrysler Marine Engine Dealer after a maximum of 250 hours of operation or at the Lay up and Fitting Out Time.

TABULATION OF POINTS TO BE LUBRICATED OR CHECKED

	Daily	25 Hrs.	50 Hrs.	100 Hrs.
Alternator			C	
Cooling System	I			
Distributor Bushings		EO		
Distributor Wick			EO	
Engine Oil	I			
Engine Oil (Drain)			EO	
Engine Oil Filter (Full Flow)				R
Fuel Filter				R
Flame Arrestors				C
Fuel and Oil Lines	I			
Fuel Tank	I-F			
Engine Crankcase Vent Valve				I-C
Hydraulic Pump		I		
Reverse Gear Control Linkage		EO		
Shaft Bearings	I			
Reverse Gears and Reduction Gears	I-A			D-A
Water, Battery	I			
Water, Bilge	I			

KEY

A—Automatic Transmission Fluid Type "A" Suffix "A"
C—Clean
D—Drain
EO—Engine Oil
F—Fuel
I—Inspect
R—Replace

ADJUSTMENTS

ELECTRICAL—DISTRIBUTOR CONTACT POINTS

Installing, Aligning and Adjustment

Loosen the terminal screw nut and disconnect the primary lead and condenser lead.

Remove the stationary contact lock screw and remove the contact point set. Clean the distributor cam lobes of dirt and grease, and intsall a new contact point set.

Connect the condenser and primary leads.

Align the contacts, as necessary, to provide center contact by bending the stationary contact bracket only. NEVER BEND the movable contact arm to obtain alignment.

After aligning the contacts, adjust point clearance using a dial indicator as follows:

a. Place the dial indicator plunger against the contact end of the movable contact. Crank the engine until the rubbing block of the movable contact rests on the highest point of a distributor cam lobe.

b. Loosen the stationary contact support lock screw just enough to permit the stationary bracket to be moved.

c. Turn the adjusting screw to open or close the point gap; clearance between the points should be from .014 to .019 inch.

d. Tighten the lock screw after each adjustment and measure the contact point spring tension with an accurate scale.

e. Hook a spring scale on the contact arm as close to the contact point as possible and pull scale gently in a straight line. Take a reading as the points start to separate. 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 the screw and recheck the spring tension.

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

Be sure that the spark plug, coil and cap cable terminals are fully seated. The nipples must fit tightly on the cap towers and around the cables. If any cable terminals or cap tower inserts are corroded be sure to clean or replace them. Check for a physically cracked cap or an electrically conductive path burned into the cap material by improper sparking. Be sure that the distributor cap is clean inside and out and that the coil cap is clean particularly around and inside the tower.

SPARK PLUGS

Cleaning and Inspection

Remove the spark plugs. Examine the firing ends of plugs for evidence of oil fouling, gas fouling, burned or overheating conditions. Clean and reset gaps to .035 inch. When installing spark plugs, tighten to 30 foot-pounds torque.

Oil fouling is usually identified by wet, sludgy deposits caused by excessive oil consumption.

Gas fouling is usually identified by dry, black, fluffy deposits caused by incomplete combustion.

Burned or overheated spark plugs are usually identified by a white, burned or blistered insulator nose and badly burned electrodes. Improper fuel, inefficient cooling or improper ignition timing normally are the causes.

Normal conditions are usually identified by white powdery deposits or rusty-brown to grayish-tan powdery deposits.

IGNITION COIL

The ignition coil is designed to operate with an external ballast resistor. When testing the coil for output, include the resistor in the tests. Test the coil according to the coil tester Manufacturer's instructions.

Check the coil for external leaks and arcing. Always make two tests, when checking the coil. One when coil is cold, the other after coil has been warmed up.

IGNITION TIMING—TIMING LIGHT METHOD (Figs. 44, 45, 46 and 47)

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

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

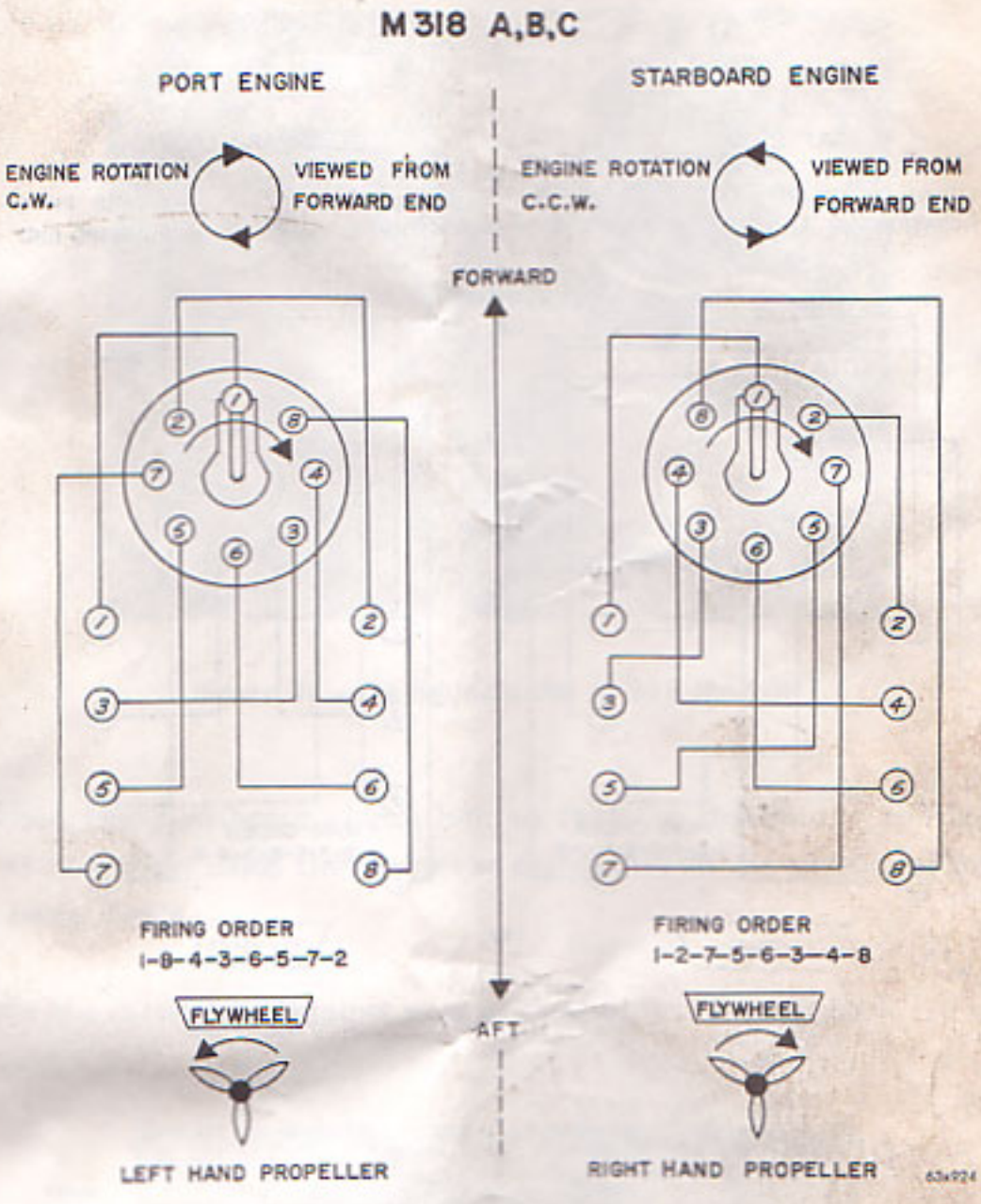


Figure 44—Firing Order Models M-318A, M-318B, M-318C

1. Connect the secondary lead of the power timing light to No. 1 spark plug, red primary lead to positive terminal of the battery and the black primary lead to negative battery terminal.

2. Start engine and set idle to 500 r.p.m., 650 r.p.m. on Models equipped with two 4-barrel carburetors.

3. Using a timing light, observe the position of timing mark on crankshaft pulley on the M-318A, M-318B, and on the flywheel end of the M-318C M-413B, M-413D, M-413E and M-426B and D.

4. Loosen the distributor clamp screw and rotate distributor housing so that specified timing mark and pointer are in alignment.

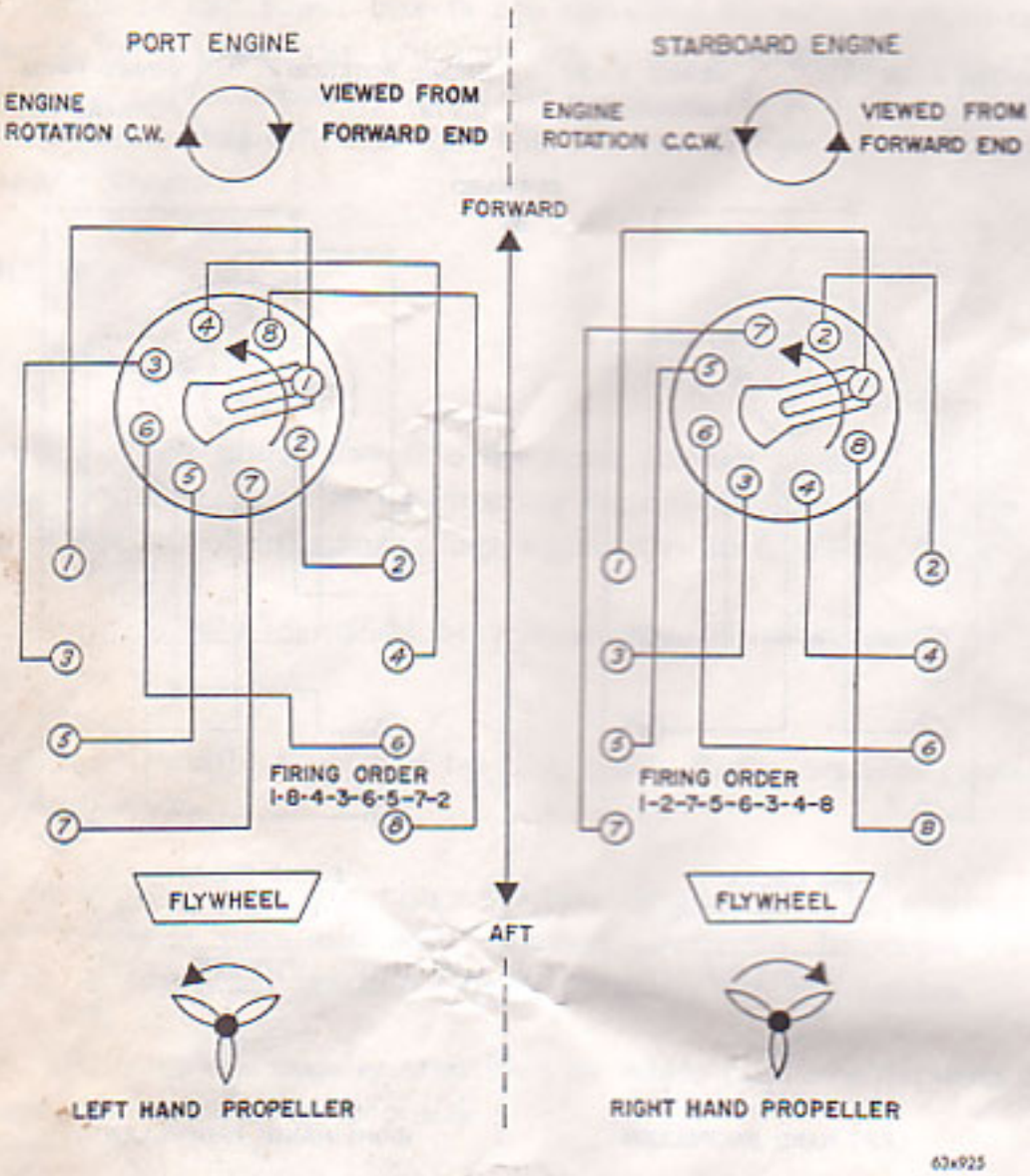


Figure 45—Firing Order Models M-383B, M-413B, M-413D, M-413E, M-426B, M-426D

5. Tighten distributor clamp screw after timing has been set and recheck timing adjustment with power timing light.

IGNITION TIMING—TEST LAMP METHOD

1. Connect a test lamp between the distributor primary terminal and the battery positive post.

2. Turn the engine until the number 6 exhaust valve is just closing; continue turning the engine slowly until the specified degree mark is at the timing indicator. (Figs. 44 and 45).

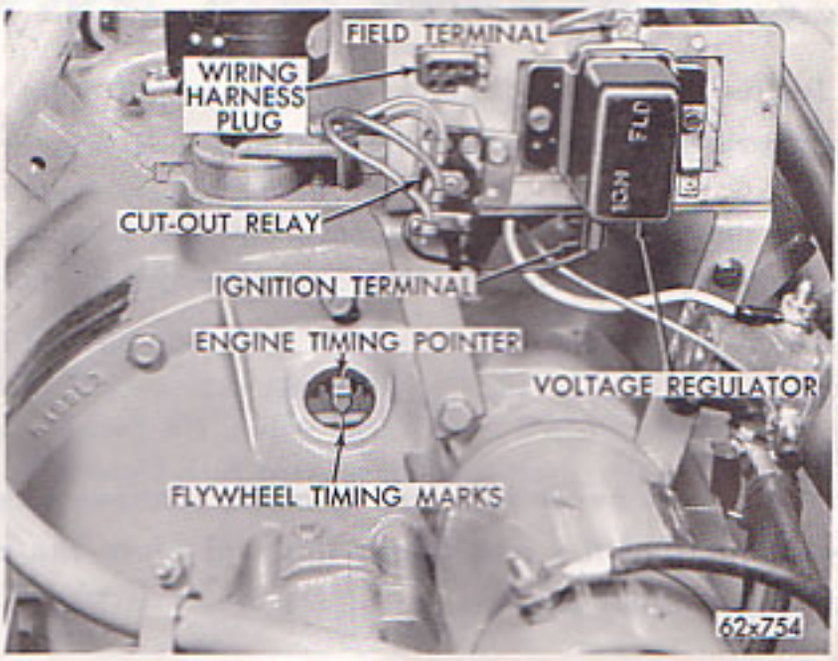


Figure 46—Timing Indicator M-318 Models

3. Loosen the distributor clamp bolt so that the distributor housing can be rotated with a slight drag, then turn the distributor in the normal rotation until the test lamp lights.

4. Turn the distributor against normal distributor rotation until the test lamp goes out.

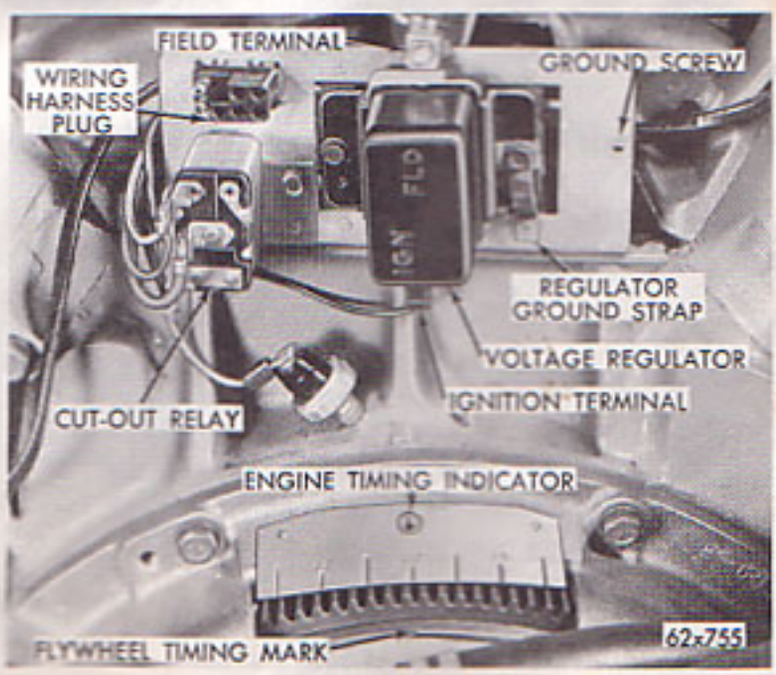


Figure 47—Timing Indicator M-383, M-413, M-426 Models

NOTE

If the test lamp lights immediately when connected, turn the distributor against normal distributor rotation until the light goes out.

5. Tighten the distributor clamp bolt securely and remove the test lamp. If the operation is performed properly, the engine is timed to specifications.

NOTE

If the engine is turned beyond the timing mark, continue turning the engine for two full revolutions of the crankshaft; this will place the distributor rotor in approximately the initial position.

CAUTION

DO NOT reverse the rotation of the crankshaft if you have passed the timing mark as this would affect the valve timing and distributor timing.

CARBURETOR IDLE ADJUSTMENTS

1. Set idle speed screw for desired idle speed (500 rpm recommended, 650 rpm on Models equipped with two 4-barrel carburetors) with engine fully warmed-up, and choke "off," with idle mixture screw one turn open (do not damage seat by over tightening).

2. Set idle mixture screw for maximum intake manifold vacuum.

3. Re-set idle speed to desired rpm.

REVERSE AND REDUCTION GEAR

The reverse gear (Fig. 48) is a hydraulically operated multiple disc clutch and planetary reverse gear train. The reverse gear is self-contained and is independent of the engine oil pressure system.

PRESSURED OIL FOR OPERATING

Pressured oil for the operation of the reverse gear is provided by an oil pump mounted inside of the reverse gear. The oil pump is driven continuously by the engine. The pressurized oil is delivered from the oil pump to the control valve and then to the forward and reverse piston, depending upon the control valve setting.

PRESSURE REGULATION

A relief valve maintains the oil at a constant pressure at approximately 120 to 140 psi at engine speeds over 1000 rpm. Pressures slightly above or below these values may be encountered. The pressure will be as low as 70 psi at 500 to 650 rpm idle speed according to the Model Marine engine. Due to variances in the relief valves the specified oil pressures are attained at normal operating ranging from 180° to 190° F.

FORWARD

Move the transmission shift lever to the extreme forward position. With the

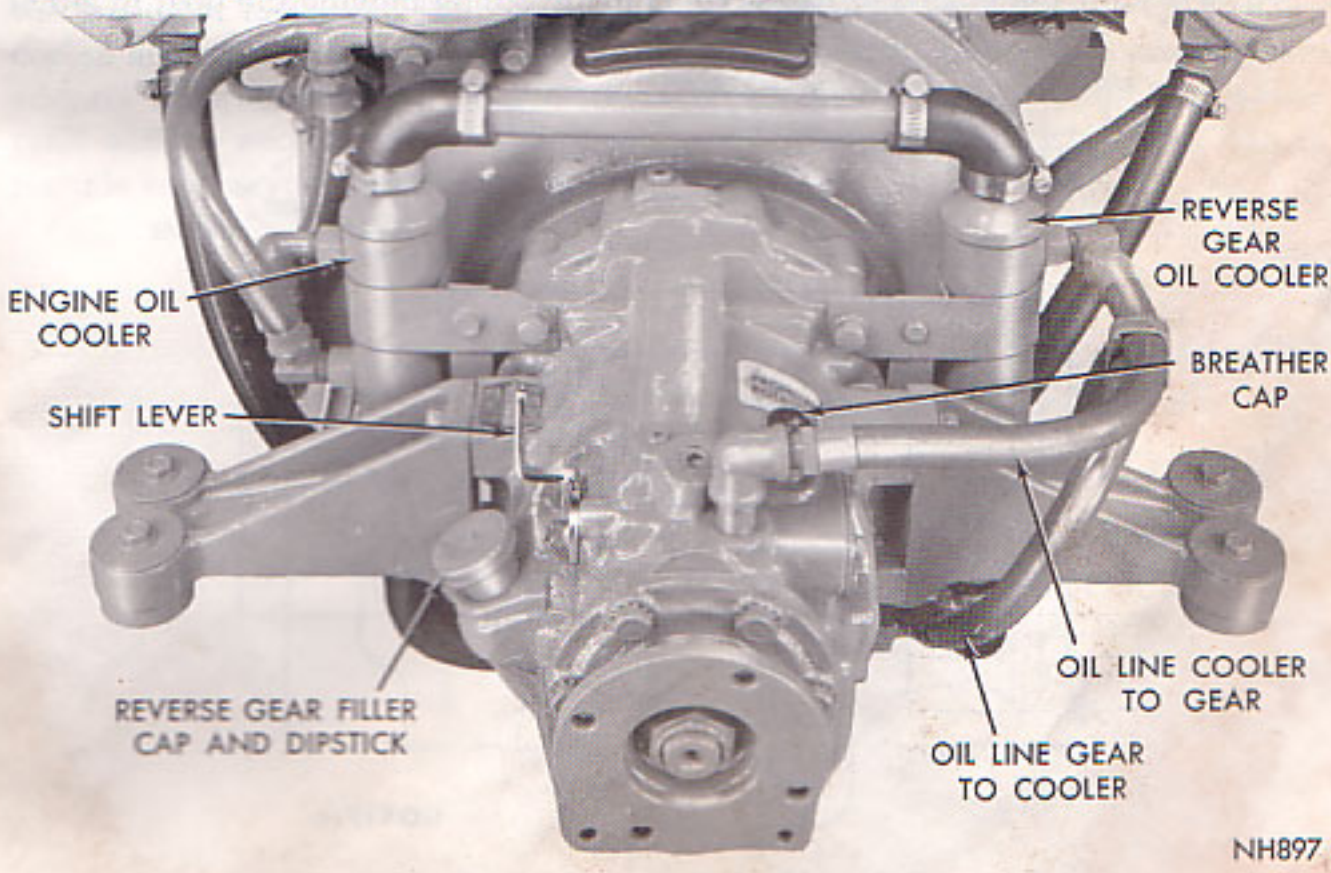


Figure 48—Reverse Gear Assembly (All Models)

shift lever so located, oil at regulated pressure flows from the control valve into porting into the transmission case, output shaft, drive gear, forward clutch cylinder, and finally into the forward clutch cavity. This clamps the multiple disc clutch, which turns the propeller shaft in the right hand direction, or in the same direction as the engine is turning.

NEUTRAL

Move the transmission shift lever to the center position where the spring loaded ball enters the chamfered hole in the side of the shift lever and properly locates it in the neutral position. With the shift lever so located, flow of pressurized oil to the clutches is blocked at the control valve, thus preventing any movement of the reverse gear train.

REVERSE

Move the transmission shift lever to the extreme rearward position where the spring loaded ball enters the chamfered hole in the side of the shift lever and properly locates it in the reverse position (Fig. 49). The resulting movement of the reverse clutch piston and the reverse clutch pressure plate locks the reverse clutch plate to the transmission case, which clamps the planetary reverse gear train, which turns the propeller shaft to the left hand direction, or in the reverse direction as the engine is turning.

STARTING THE ENGINE

Always start the engine in neutral thereby avoiding moving the boat in either

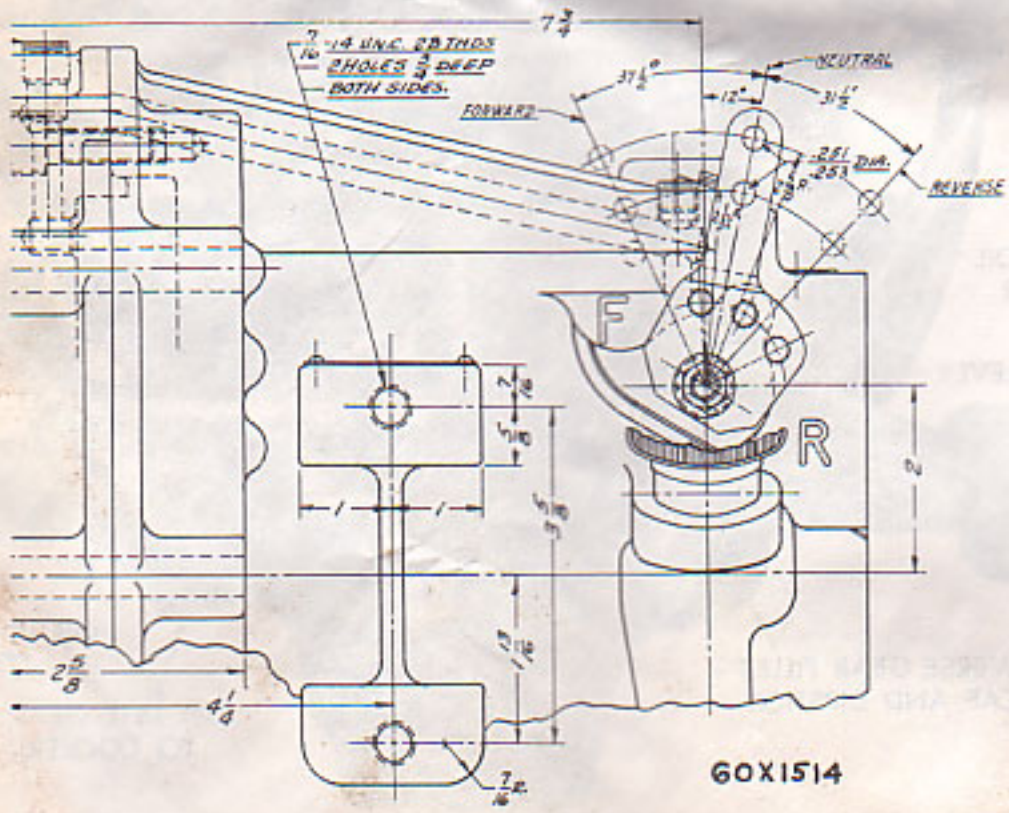


Figure 49—Shift Lever Operations

direction. Never shove off until the engine is warmed up to operating temperature. It is suggested that shifting be done at engine speeds below 1000 rpm and preferably in the 800 rpm range to prolong the life of the engine, reverse gear and the boat. Do not shift your engine at higher engine speeds unless an emergency arises.

REVERSE GEAR OIL COOLING

Since the oil is separate from the engine oil, the reverse gear oil is directed to a separate oil cooler, thereby acting in the capacity as a heat exchanger.

OIL LEVEL

Using the dipstick, check the oil periodically in the reverse gear, as the oil must be maintained at the proper level for the reverse gear to function properly.

OIL CHANGE

The oil changes vary with the operating conditions; however, under normal conditions, the oil should be changed every 250 hours, or seasonal. After draining the oil from the reverse gear the removable oil screen should be thoroughly cleaned.

OIL TYPE

Refill the reverse gear with automatic transmission fluid Type "A" Suffix "A" oil. The reverse gear should be filled to the "Full Mark" on the dipstick. Start the engine at low speed for a short time in order to fill all circuits, including the cooler and the cooler piping. Check the oil level with the engine running and add oil to bring the reverse gear level up to the full mark again. The above refill will be necessary on all reverse gears regardless of the ratio, and also to include any varying angle of the engine installed in the boat.

LAYING UP AND FITTING OUT

LAYING UP

During the running season, many owners make use of the engine room log at the back of this book. The engine room log can be used to determine what maintenance schedule change may be necessary to adopt the schedule to suit a local condition, one particular vessel or a certain operating situation.

Prior to lay-up, some owners have a thorough inspection made at their Chrysler Marine Service Center. Such an inspection will determine the amount of maintenance which should be completed before going into commission again. A good compression test and a few over-all electrical tests will usually disclose the normal requirements. You can then tailor and schedule all items to arrive at a reasonable commissioning date.

MoPar Engine Oil Supplement when used in the engine oil for a short time before lay-up, neutralizes acid conditions, breaks up gum and sludge formations as it cleans the engine interior. The foreign matter then is removed when the oil is changed on the day the vessel is removed from the water.

Engine Protection

1. It is advisable to lay-up the engine assembly in the cleanest possible condition.

2. Change the oil and oil filter element. Fill the crankcase with the correct viscosity of oil which should be used when the anticipated atmospheric temperature will be above or below 32° F. After the initial fill add one quart of Engine Oil Supplement, MoPar Part No. 1879406 to the crankcase, to obtain the best corrosion protection.

3. Shut off the fuel valves at the gas tanks. Disconnect the line between the valve and the fuel pump. Insert the end of the fuel line which is still connected to the fuel pump into a six ounce can of MoPar Fuel Detergent and Valve Lubricant, Part No. 1643272.

4. Start the engine and run at fast idle approximately 1200 rpm. Make sure that the fuel pump picks up all of the Detergent through the fuel lines during this operation. Run until the engine stalls from the lack of fuel.

5. Remove the spark plugs and disconnect the ignition coil wire. Using an oil squirt can spray approximately one ounce of Engine Oil Supplement, MoPar Part No. 1879406, into each cylinder.

CAUTION

Do not put more than specified amount of Supplement into each cylinder, otherwise a hydraulic lock may occur resulting in bent connecting rods and piston damage.

Rotate the engine several revolutions with the starter to distribute the oil on the cylinder walls. Replace the spark plugs and reconnect the ignition coil wire.

6. Remove the cylinder head covers. Using a clean spray gun with dry air, coat the rocker arms and shaft, valve springs, push rods and valve stems with Engine Oil Supplement, MoPar Part No. 1879406.

Cooling System Protection

1. Flush the cooling system with fresh water. (Flushing the cooling system prior to draining is desirable particularly on engines in boats operating in sea water.

2. Drain the water pump by removing the water pump cover. On Sherwood pumps, loosen the pump at the middle.

3. Remove the impellers from the water pump and store in a protected area. On the M-318 Models the water pump must be removed from the engine before the cover and impellers can be removed.

4. Drain the cylinder block by removing the drain plugs from both sides of the cylinder block.

5. Drain both of the exhaust manifolds where the drain plugs are used. If there are no drain plugs the hoses at the bottom rear of both manifolds must be disconnected.

6. Drain the exhaust risers by removing the drain plugs.

7. Drain the oil cooler by removing the drain plug.

8. Drain the intake manifold on Models M-318C, M-413E, and on all Models using water heated manifolds.

9. Remove the hose at the oil cooler outlet.

10. Remove the hose at the water pump outlet to the cylinder block.

11. Make sure that the low position exhaust lines and the muffler which cannot be drained are protected against the elements.

ENGINE ROOM LOG

Date	Engine Started	Engine Stopped	Trip Total		Total Hours Accumulated On Engine		On Oil		Fuel Tank	Maintenance and Other Data
			Hrs.	Min.	Hrs.	Min.	Hrs.	Min.		
Forwarded from Previous Page					100	—	—	10		Oil Change
6-1-64	5:00 A.M. 11:00 A.M.	10:00 A.M. 4:30 P.M.	5 5	00 00	110	00	10	10	20	Drift Fishing Pleasure Trip—Daily OK
6-3-64	6:30 A.M. 12:30 P.M.	11:00 A.M. 5:30 P.M.	4 5	30 00	119	30	19	40	15	Deep Sea Fishing Wind Calm—Trolling
6-5-64	8:00 A.M. 12:30 P.M.	11:30 A.M. 6:30 P.M.	3 6	30 00	129	40	29	50	20	25 Hr. Operation Water Skiing
Carry Forward					129	40	29	50		

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