SAFETY SYMBOLS

The purpose of safety symbols is to attract the operator's attention to possible dangers. The symbols, and the explanations with them deserve the operator's careful attention and understanding. Safety warnings do not by themselves eliminate any danger; the instructions or warnings they give are not substitutes for proper accident prevention measures. The following is an explanation of the symbols used in this manual.

△ **SAFETY WARNING:** Failure to obey a safety warning may result in injury to operator or to others.

▭ **NOTE:** Advises you of information or instructions vital to the operation or maintenance of your equipment.

FOREWORD

The operator's manual is published as a guide and reference to assist the new owner of a Chrysler Marine Engine in obtaining satisfactory operating performance.

Chrysler Corporation recommends that the owner discuss with his selling dealer the conditions and environment in which the boat will operate. The owner should request the selling dealer to make recommendations relative to optional equipment; such as sea strainers, etc., that will protect his marine propulsion system and promote engine life and efficiency. Schedules of recommended pre-delivery inspections are included in this manual. Chrysler Corporation advises that damage from water entering the engine through the exhaust due to conditions beyond Chrysler's control, or damage from water entering the carburetor due to deck leakage or inadequate protection from rain, spray, or hosing is not covered by Chrysler warranty.

In order to obtain optimum performance, it is necessary that the unit be treated with reasonable care and that inspection, operation and maintenance procedures be closely followed.

At time of sale, it is recommended that the selling dealer perform a thorough pre-delivery inspection of boat, engine and drive unit (reverse gear). Whenever possible, the owner should request sea trial to determine for himself that adequate pre-delivery inspection and preparation have been performed. In addition to inspection upon delivery, Chrysler Corporation recommends that the second inspection should be performed by an authorized Chrysler Marine Service Dealer after twenty (20) hours of operation or sixty (60) days from date of sale.

Chrysler Corporation advises owners of the importance of proper laying up, fitting out, cooling system protection, and propeller shaft alignment on the performance of the engine and reverse gear.

The nationwide organization of Chrysler Marine Distributors and Distributor Dealers are ready to aid you in maintaining your Chrysler Marine Engine in top operating condition. The Chrysler Marine Service Network includes facilities equipped with the necessary special tools and skilled mechanics and technicians specially trained to work on your Chrysler Marine Engine. Chrysler Corporation recommends that all service and maintenance be performed by authorized, qualified Chrysler Marine service dealers.

▭ *Subject:* **MODIFYING CHRYSLER MARINE ENGINE**

Any modification made to a Chrysler Marine Engine Assembly or Components, which changes the engine function in general, will void engine warranty.

Any add-on device which uses or affects engine function, will also void engine warranty.

Chrysler Marine does not formally approve modifications or add-on devices for its Chrysler Marine engine. If requested, Chrysler Marine will offer comments as to the benefits and/or disadvantages of such modification or add-on devices. The customer will have to accept full responsibility for modification made to the engine that affects the engine function, as well as full responsibility for any add-on devices.

This manual provides regular, easy to follow operating instructions, maintenance and service plans for your Chrysler Marine Engine.

Chrysler Corporation reserves the right to make changes in design and specifications, and/or to make additions to or improvements in its product without imposing any obligations upon itself to install them on products previously manufactured.

SPECIFICATIONS AND ADJUSTMENTS

MODEL NAME	CHRYSLER 215	CHRYSLER 230	CHRYSLER 240	CHRYSLER 275	CHRYSLER 340
Engine Designation	LM318A	M360A	LM318B	M360B	M460B
Type	90° V8-OHV	90° V8-OHV	90° V8-OHV	90° V8-OHV	90° V8-OHV
Cylinder Bore	3.91 in.	4.00 in.	3.91 in.	4.00 in.	4.36 in.
Stroke	3.31 in.	3.61 in.	3.31 in.	3.61 in.	3.85 in.
C.I.D./Liters	318/5.2	360/5.9	318/5.2	360/5.9	460 cu. in.
Compression Ratio	9.0:1	8.5:1	9.0:1	8.5:1	9.0:1
Compression Pressure Max. Variation 20 PSI	120 psi min. @ 150-200 rpm	120 psi min. @ 150-200 rpm	120 psi min. @ 150-200 rpm	120 psi min. @ 150-200 rpm	110 psi min. @ 150-200 rpm
Recommended Proping Wide Open Throttle	4000-4400	4000-4400	4000-4400	4200-4800	4200-4800
Horsepower Recommended RPM	215 @ 4400	230 @ 4400	240 @ 4400	275 @ 4600	340 @ 4500
Oil Pressure (Operating @ 2000 rpm)	30-80 lbs.	30-80 lbs.	30-80 lbs.	30-80 lbs.	30-80 lbs.
Crankcase Capacity 7° Installation Angle	6 qts.**	6 qts.**	6 qts**	6 qts.**	5 qts.**
Stamped Pan	4 qts.**	4 qts.**	4 qts.**	4 qts.**	5 qts.**
Oil Grade	See Lubrication Section				
Fuel Grade (Gasoline)	Leaded or Non-Leaded		Leaded or Non-Leaded		Leaded or Non-Leaded
Spark Plug Make	Champion	Champion	Champion	Champion	Champion
Type	RN9Y	RN9Y	RN9Y	RN9Y	RBL11Y
Spark Plug Gap	.035 in.	.035 in.	.035 in.	.035 in.	.035 in.
Ignition System	Electronic	Electronic	Electronic	Electronic	Electronic
Ignition Timing	5° BTC	5° BTC	5° BTC	5° BTC	5° BTC
Carburetor	2 Bbl.	2 Bbl.	4 Bbl.	4 Bbl.	4 Bbl.
Tappet Clearance	Hydraulic Tappets	Hydraulic Tappets	Hydraulic Tappets	Hydraulic Tappets	Hydraulic Tappets

Rotation: The rotation designation stamped on the engine serial number plate refers to the rotation of the propeller shaft when viewed from the stern looking towards the engine. The letter R indicates a right hand propeller shaft rotation; the letter L indicates a left hand propeller shaft rotation.

Firing Order — Referring to the rotation and reduction designation on the engine Serial Number Plate: —
For R10, R15, R20, R25, R30 and L19* Firing order is 1-2-7-5-6-3-4-8 (6M318-360)
For L10, L15, L20, L25, L30 and R19* Firing order is 1-8-4-3-6-5-7-2 (6M318-360)

For LM318-360 engines the No. 1 cylinder is the front cylinder on the left side when viewed from the flywheel looking towards the water pump. For the M460 the No. 1 cylinder is front right side.

M460 — R Hand & L19*-18736245. L Hand & R19*-15426378

*The reason for these exceptions L19 and R19 is that the design of the Warner 1.9:1 reduction gear results in the propeller shaft turning in the opposite direction from the engine.

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

Engine oil capacity will vary with installation angle, fill only to full mark on dipstick. **Do not overfill.**

Battery Polarity — All Engines — Negative Ground Only

FINAL DRIVE

WARNER GEAR "VELVET DRIVE"

Recommended Lubricant	Automatic Transmission Fluid (ATF), Type "A" Suffix "A" or "Dexron"
Capacity	Fill to mark on dipstick after unit has been run for a few minutes in both "Forward and Reverse"

IDLE RPM 600-650 --- IN GEAR p.16

TEMP. P.8, 21

MAINT. SCHED. p. 24

IDLE OIL PRESS. 8 LBS p. 20

MODEL IDENTIFICATION

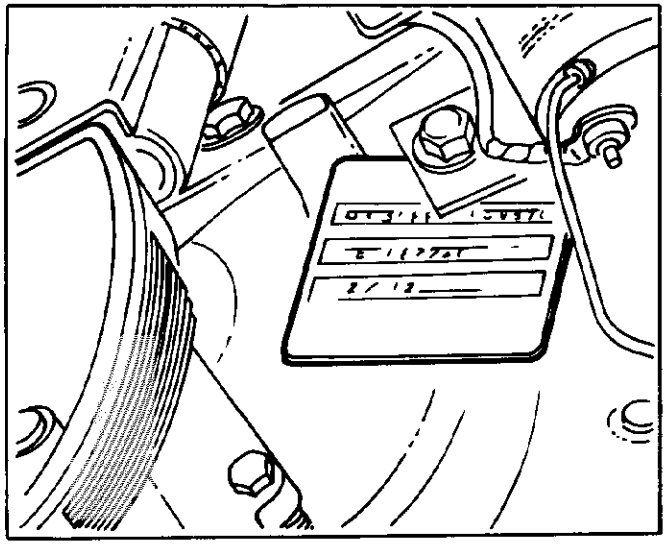


Figure 1—Engine Model and Serial Number Plate

A name plate (Figure 1) is attached to the engine showing complete model number and engine serial number. Details of the model code are shown in Figure 2, and as all letters and numerals have a particular significance, it is extremely important that complete model number and serial number be furnished when servicing the engine.

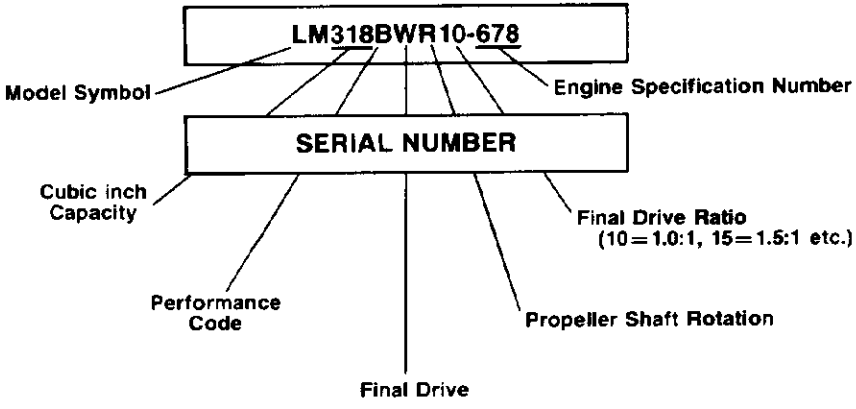


Figure 2—Engine Model Code

PRE-DELIVERY INSPECTION

☐ A. Recommended "In-Shop" Pre-Delivery Inspections.

1. Engine Oil

Check oil level. If oil level is above the "FULL" mark, excess oil must be removed. See "LUBRICATION" section for additional information.

2. Reverse Gear

Check engine oil level. See appropriate section of this manual for additional information.

3. Water Hoses, Oil Hoses, Fuel Lines

Check all oil, fuel and water lines for tightness. Check routing of all hoses for kinks, restrictions or interference with moving parts.

4. Exhaust

Check the installation of exhaust hoses, mufflers and pipes to ensure that they do not form a water trap. Check exhaust hose clamps for tightness.

5. Drive Belts

Check tension of all drive belts. See "Accessory Drive" section for correct procedures and specifications.

6. Throttle Control

Without engine running, and with flame arrestor removed from carburetor, operate the throttle lever control to both full throttle and closed throttle positions and visually check carburetor for corresponding wide-open throttle and base idle positions. If proper function cannot be obtained by adjustment of carburetor linkage, it may be necessary to adjust the throttle control following the manufacturer's recommended procedures.

7. Shift Control

Without engine running, operate shift control and check for full forward and reverse travel of transmission shift lever at the transmission.

8. Steering Mechanism

Turn steering wheel and visually check for full rudder.

9. Electrical

Check battery for proper fluid level; check that the battery is securely mounted and battery cable connections are tight. Examine all electrical connections for security and check routing of wiring harness and individual leads. Check instrument panel for initial fluctuation of gages, indicating activity. Turn ignition key momentarily to ensure that engine will turn over. Check operation of bilge blower, bilge pump, running lights and other boat accessories.

10. Cooling System

Check that all drain plugs are installed and tight.
On fresh water cooled models, check level of coolant in the expansion tank. The correct coolant level is approximately 1-1/4" below the bottom of the filler neck. And coolant as necessary. See "Cooling System" section for recommended coolant. Coolant Recovery Tank (if used) should be filled to full mark with cold engine.

△ **CAUTION: Do not overfill.**

B. Recommended "In-Water" Pre-Delivery Inspections.

1. Propeller Shaft Alignment

Engine must be aligned to the propeller shaft within .002" measured at the shaft coupling face. See "Final Drive" section for additional information.

☐ **NOTE: Boat should be in water for at least 24 hours before checking alignment.**

2. Cooling System

Open sea-cock and inspect water inlet system for leaks.

3. Start Engine

△ **SAFETY FIRST. Before starting engine, engine compartment must always be thoroughly ventilated. Operate bilge blower and/or uncover engine compartment for several minutes to remove all gas fumes.**

Check immediately for water circulation by visually checking discharge of water from the transom exhaust outlet, or by feeling exhaust hoses to determine the flow of water. Check oil pressure gage for proper oil pressure. Check voltmeter for steady reading of 13.5 to 14.5 volts. Allow engine to warm up at approximately 750-850 RPM until normal operating temperature is reached.

4. Engine Test

(1) Engine Break-In

After engine is warmed up, inspect for any leakage—water, oil, fuel or exhaust. Check engine idle speed. Recommended idle speed is 600 to 650 RPM in gear (inboard models). Check all controls for proper function. Initial break-in of the engine for approximately 1 hour at 1/2 rated RPM should be accomplished before any full throttle tests are made. During this period, check all gages for any abnormal readings. Check engine for any unusual mechanical noises and/or vibration.

(2) Engine Rated RPM

The engine rated RPM is extremely important as engine life and efficiency are directly related to the rated RPM. When the particular boat is completely loaded with fuel, water, and the number of people for which the boat is rated, the engine **must** be able to reach its rated RPM at wide-open throttle. This can only be achieved if the correct propeller has been selected, otherwise the engine cannot develop its full horsepower, and is running in an overload condition throughout its entire operating range, resulting in lack of performance, increased fuel consumption, and shortened engine life. To check rated RPM, operate engine at wide-open throttle just long enough to stabilize speed and check propeller. **Do not allow engine to overspeed.** For pre-delivery test on inboard powered boats: with 1/2 tank of gas and 2 people on board, engine speed at wide-open throttle should be within the W.O.T. range as listed in the "Specification and Adjustments," page 2. If they are not within the range, the propeller should be checked for correct application.

OWNER GUIDE: 10 POINT START-UP AND OPERATING INSTRUCTIONS

Each time boat is used:

1. **SAFETY FIRST. Before starting engine, engine compartment must always be thoroughly ventilated. Operate bilge blower and/or uncover engine compartment for several minutes to remove all gas fumes.**
2. Check: Engine Oil Level
   Transmission Oil Level
   Coolant Level (closed cooling models)
3. Check for Visible signs of oil, fuel or water leaks.
4. Check that all boat equipment is operating properly, and that all the required safety equipment is on board.
5. Set transmission lever in Neutral. For single level controls, the throttle and shift levers should be disengaged from each other as per the manufacturer's operating instructions. Set throttle control to approximately one-quarter throttle.
6. Start engine and return throttle control to idle position. Immediately check transom exhaust outlet and/or exhaust hose for cooling water flow. It may be necessary to momentarily increase engine speed to 1000 RPM to start water circulating. If there is no apparent water flow, stop engine at once and investigate. Allow engine to idle at 750-850 RPM until normal operating temperature is reached.
7. Check all gauges for normal readings.
8. Cast off and when open water is reached, move throttle to wide open and observe that maximum rated RPM is attainable. Throttle back at once upon reaching maximum engine RPM, and set throttle to the desired cruising RPM. Maximum continuous cruising speed should not exceed 8/10 of rated RPM. Most economical cruising is determined by test, and for a planing hull, is at or slightly above the minimum planing speed.
9. If maximum rated engine RPM is not attainable because of excess load, build up of marine growth on hull, or incorrect propeller, adjust the load, have the hull cleaned, or see your dealer for a propeller which will permit maximum rated RPM—**otherwise** you are shortening engine life, burning too much fuel and oil.
10. A constant check should be maintained on all engine gauges and immediate action taken whenever abnormal readings are noted.

The detailed instructions contained in the "Operating Instructions" section of this manual should be carefully read and observed.

Raw Water Cooling

Two belt-driven water pumps are used in the raw water cooling system—an automotive type circulating water pump with cast iron impeller to circulate water through the engine, oil cooler, exhaust manifolds and exhaust outlets, and a rubber impeller type water pump to supply water to the circulating pump. A thermostat in the system regulates engine temperature to approximately 140°F to 165°F and controls the re-circulation of water for rapid engine warm-up. See water circulation diagram Figure 3.

Fresh Water Cooling

A belt-driven automotive-type circulating water pump is used to circulate coolant in the engine, with a rubber impeller type water pump, also belt driven, being used to supply cooling raw water to the heat exchanger, oil cooler, exhaust manifolds and exhaust outlets. A thermostat in the fresh water circuit of the cooling system regulates engine temperature to approximately 165°F 200°F and controls re-circulation of coolant for rapid warm up. Coolant level in the fresh water system should be checked daily and maintained about 1-1/4" below the bottom of the filler neck of the surge tank. Coolant Recovery Tank (if used) should be filled to full mark with cold engine.

△CAUTION: Do not overfill.

△CAUTION: This system is equipped with a pressure cap on the surge tank. Cap should be removed slowly and carefully from a hot engine. The recommended coolant is a 50/50 solution of a good brand of permanent-type anti-freeze and clean soft water, which will provide engine protection to −20°F; when used year round, this mixture will provide anti-corrosion protection for the cooling system. As an added precaution, coolant should be changed annually.

See water circulation diagram Figure 4-5, 6 or 7.

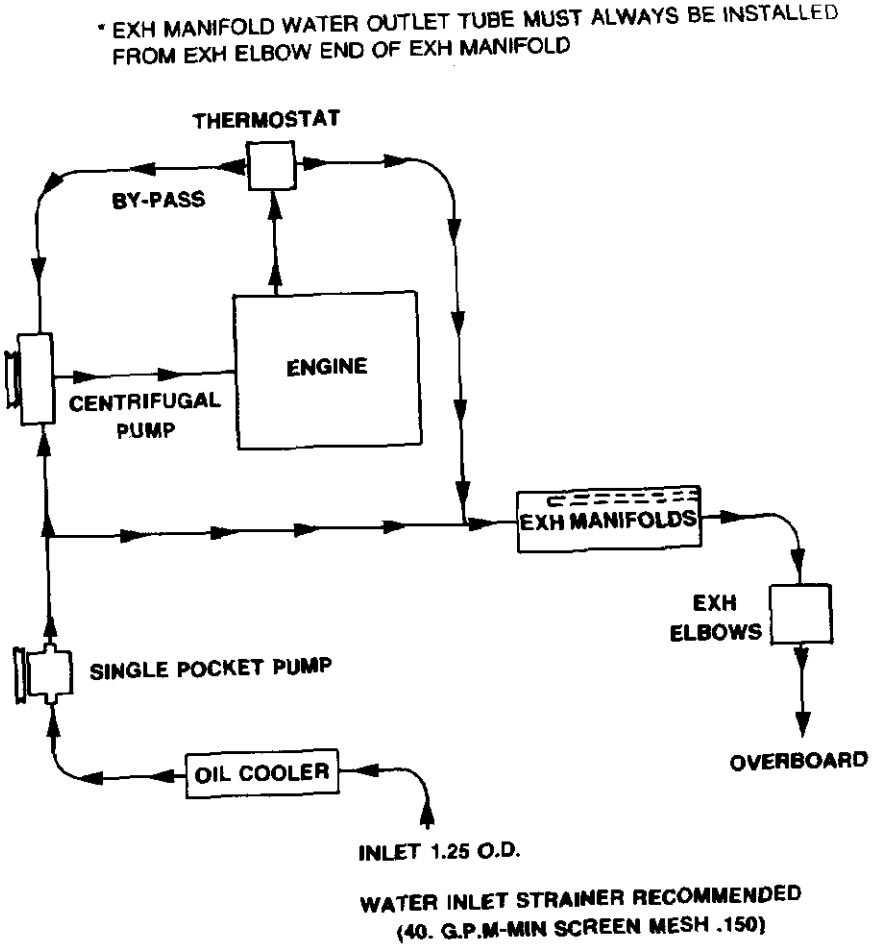


Figure 3 – Cooling System Diagram.
Model LM318 and Model M360 with raw water cooling system.

LM318, M360
FRESH WATER COOLING SYSTEM
(FULL)

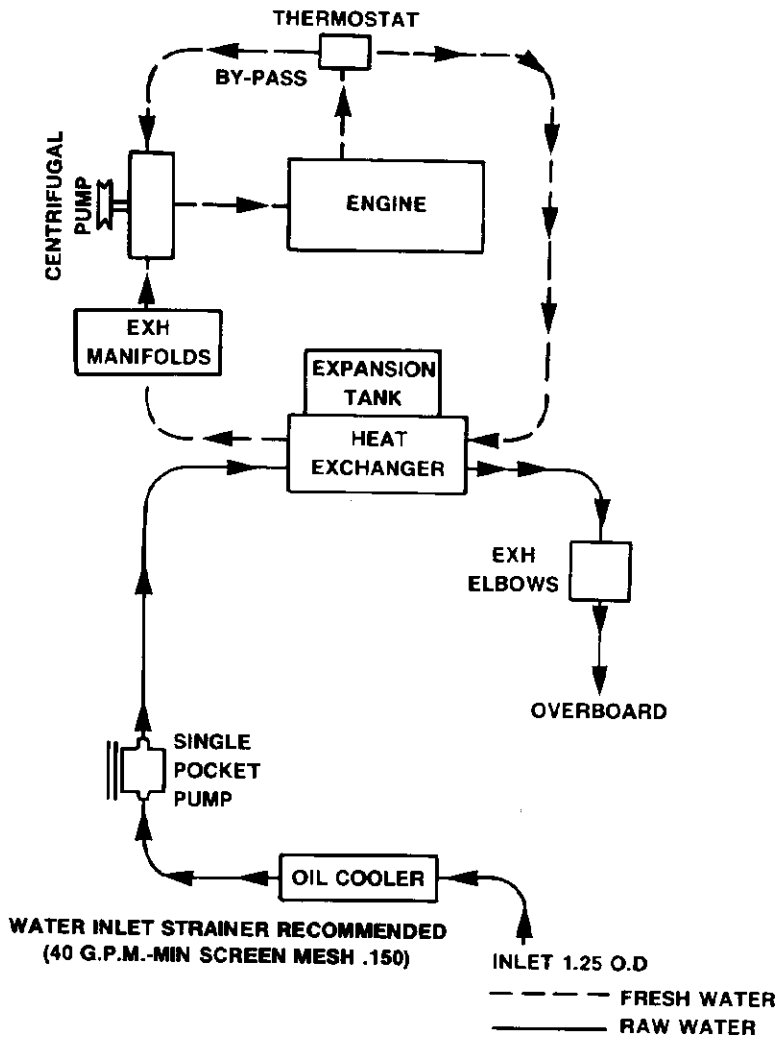


Figure 4 – Cooling System Diagram.
Model LM318 and Model M360 with fresh water cooling system.

LM318
FRESH WATER COOLING SYSTEM
(PARTIAL)

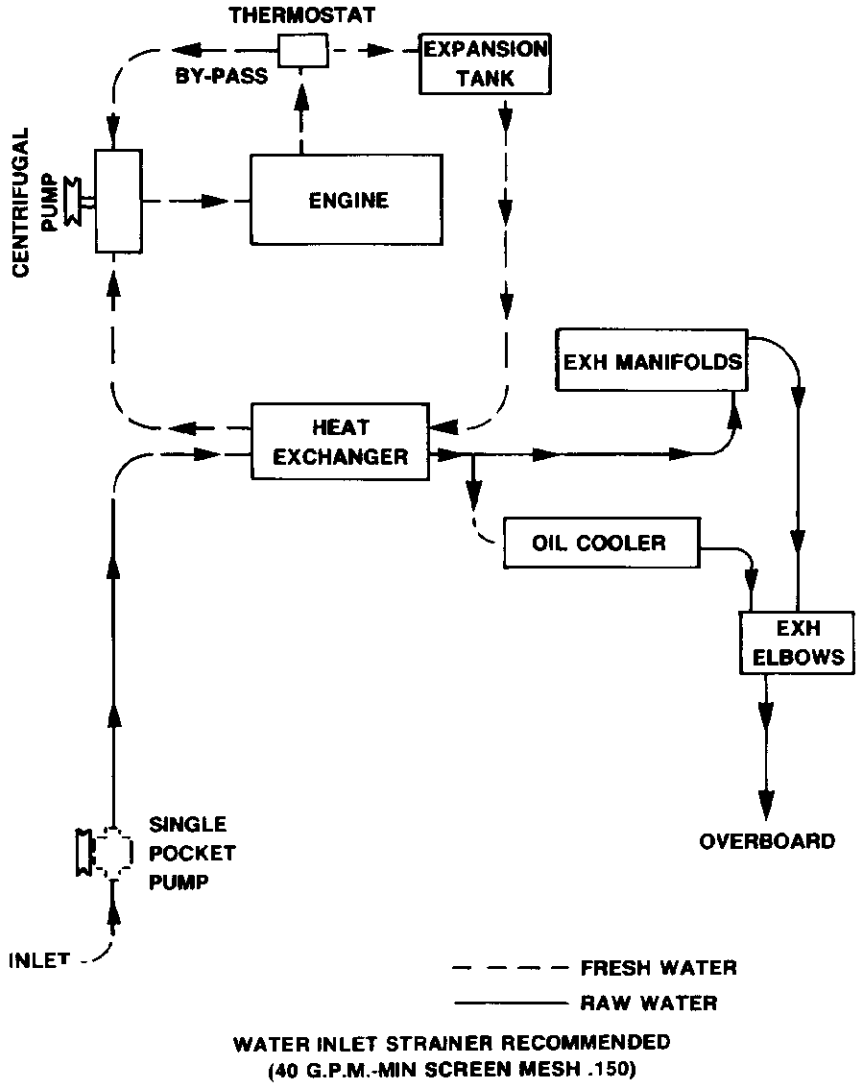


Figure 5 – Cooling System Diagram.
Model LM318 with fresh water cooling system.

M360
FRESH WATER COOLING SYSTEM
(PARTIAL)

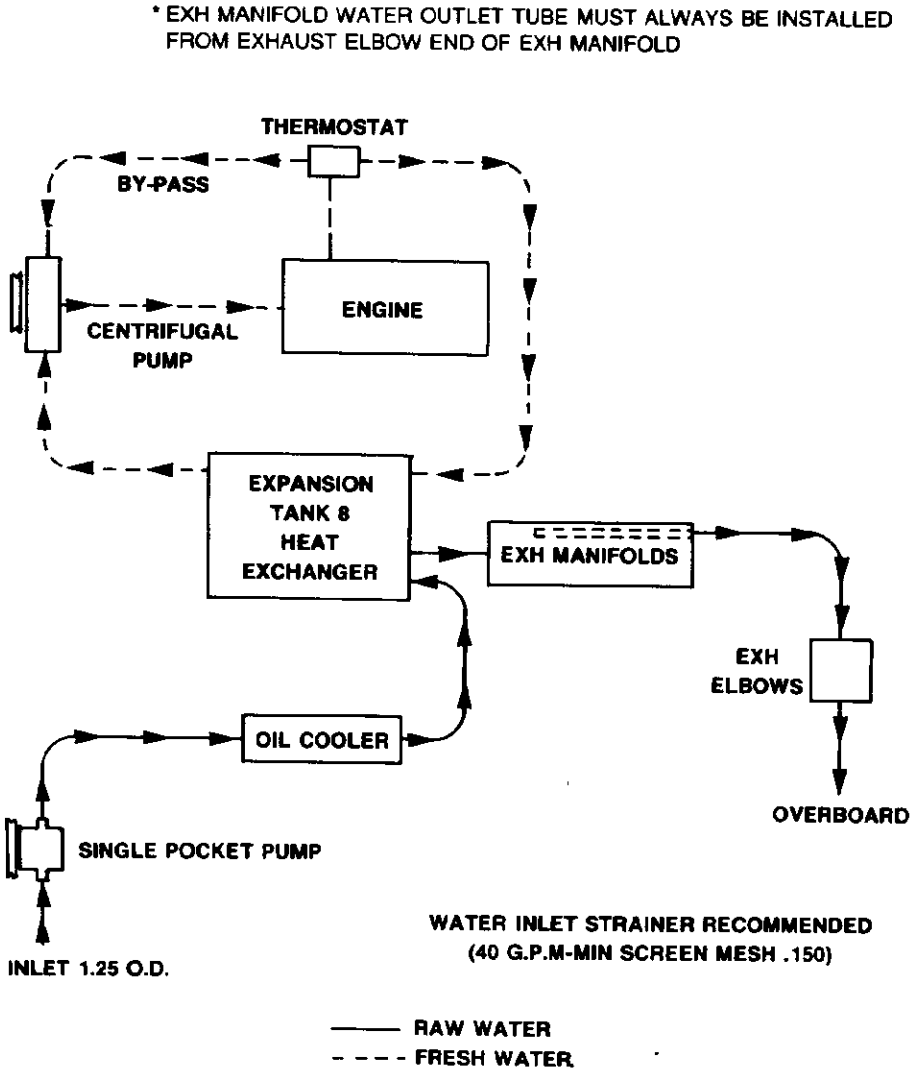
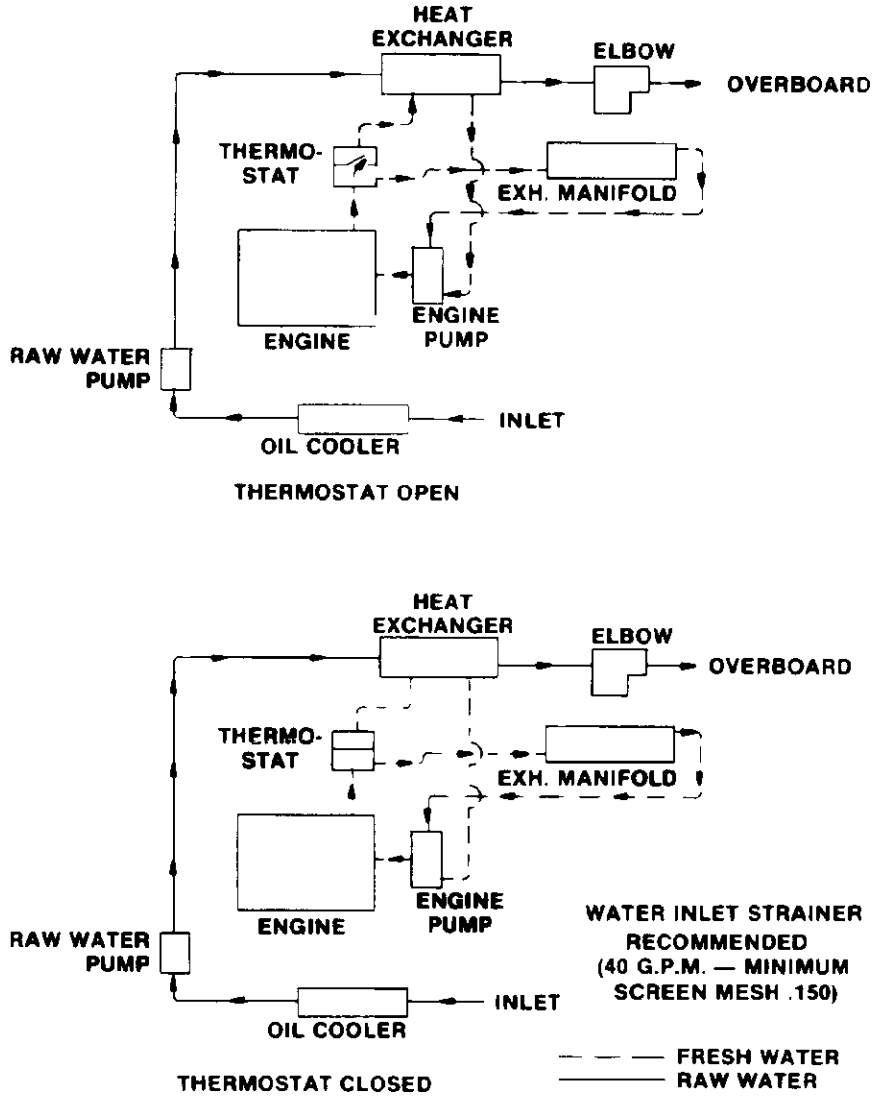


Figure 6 - Cooling System
Model M360 with fresh water cooling system.

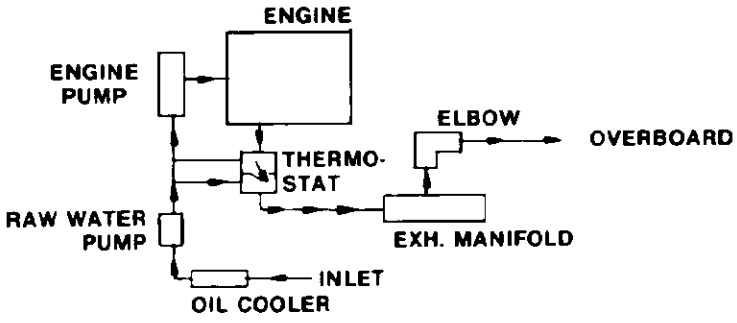
LM318, M360, M460
FRESH WATER COOLING SYSTEM
(FULL)



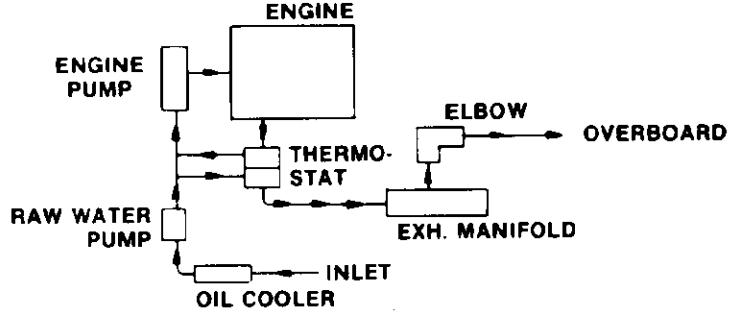
COOLING SYSTEM DIAGRAM
F.W.C./CENTER RISE MANIFOLDS

Figure 7 — Cooling System Diagram
Models LM318, M360 and M460 with fresh water cooling system.

LM318, M360, M460
RAW WATER COOLING SYSTEM



THERMOSTAT OPEN



THERMOSTAT CLOSED

WATER INLET STRAINER RECOMMENDED
(40 G.P.M. — MINIMUM SCREEN MESH .150)

COOLING SYSTEM DIAGRAM
RAW WATER/CENTER RISE MANIFOLD

Figure 8 — Cooling System Diagram
Models LM318, M360 and M460 with raw water cooling system.

ACCESSORY DRIVE

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

The belt tension can be checked 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. The deflection should be 1/4 inch.

For the most accurate adjustment, belt tension should be checked after engine has been run for at least several minutes and belt is warmed up to a normal flexible condition.

To adjust the belt, loosen the mounting bolts on the alternator (or water pump), and use a bar to apply tension, being careful not to damage the alternator (or water pump). Tighten the mounting bolts and check the deflection. It may be necessary to repeat this procedure several times to establish the correct tension.

ENGINE CRANKCASE VENTILATOR VALVE

All models are equipped with a positive crankcase ventilating system (Figure 9). The system must be kept clean to maintain good engine performance and durability as deposits will accumulate in the valve, hoses

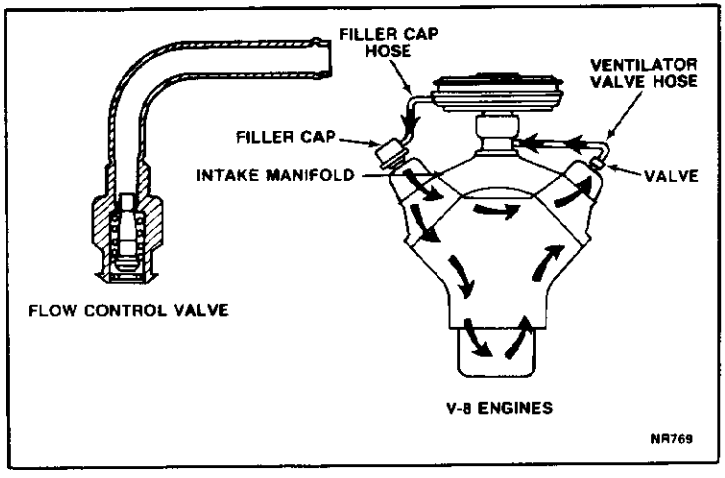


Figure 9 — Positive Crankcase Ventilation System

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.

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 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.

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. Remove the carburetor from the engine and clean crankcase passage as follows. The carburetor passages should be cleaned by hand turning a 1/4" in the openings to dislodge solid particles. Blow clean with compressed air. If a 1/4" drill appears to be too large, use a smaller drill. It is not necessary to disassemble the carburetor for this service.

FUEL SYSTEM

☐ It is very important that the gasoline used meets the requirements for your engine. Use of gasoline which does not meet these requirements can result in burned valves and pistons, poor engine performance and shorter engine life.

Regular grade leaded or no lead gasoline is acceptable. Use leaded type where available.

△ Carburetor and Fuel Lines

It is important that all fuel connections be kept tight and that dirt be kept out of the carburetor. Clean the flame arrestor periodically as operating conditions warrant.

The carburetor is equipped with non-adjustable high speed jets which require no attention. The engine idle speed should be approximately 600 to 650 RPM in gear (inboard engines).

ELECTRICAL SYSTEM

The electrical system includes an alternator, alternator regulator, starting motor, starting motor solenoid, ignition distributor, ignition coil, ballast resistor, spark plugs, together with the necessary cables and connecting wires (Figure 10).

The electronic ignition system includes the electronic ignition distributor, electronic control unit, a dual ballast resistor and the different wiring necessary for the system.

In the electronic ignition system, maintenance is reduced to a minimum — see "Maintenance" section.

The electrical components mounted on the engine include the solid state voltage regulator; an oil pressure actuated switch which controls current feed to the voltage regulator; engine oil pressure sending unit; starter solenoid; and a 25 & 50 amp manual reset circuit breaker. The dual ballast resistor is also mounted on the engine.

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

☐ In all cases where a "Fast Charger" type battery charger is 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 booster positive lead to the positive terminal of the battery.

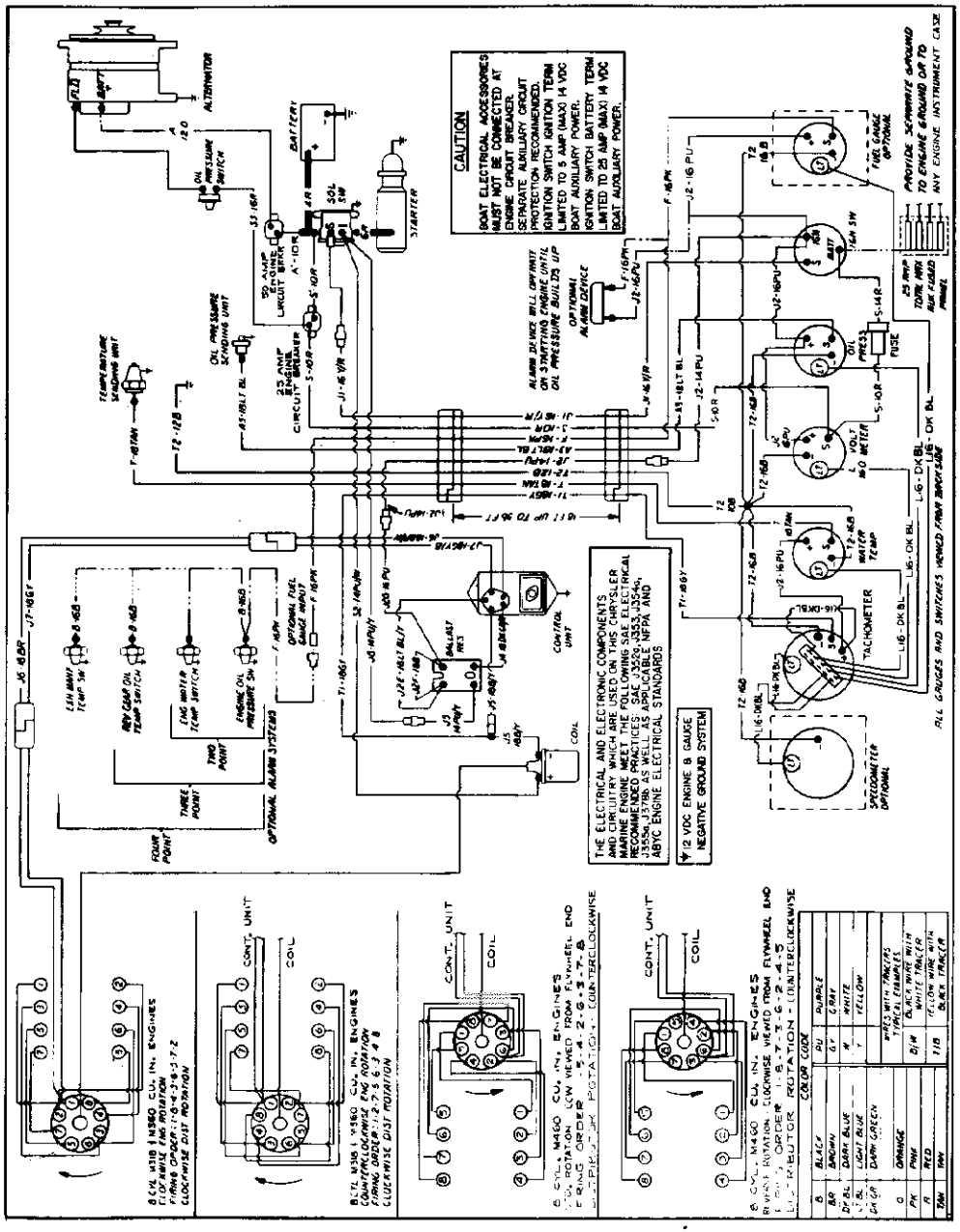


Figure 10 — Wiring Diagram
Chrysler Marine Engine with Electronic Ignition
Warner Velvet Drive — V-Drive

△ Always ventilate the engine compartment and examine the bilge for leaks every day. Allow the bilge blower to run for approximately five minutes. This will ensure that no gas fumes are present in the bilge when engine is started. Make a visual inspection of the fuel system and the cooling system during this time. Check the engine oil level indicator. The oil level should be maintained between the marks on the dipstick. Do not over fill.

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.

Make "Daily Inspection" as outlined in the Maintenance Section.

Engine Oil

See that the crankcase contains the correct amount of clean new engine oil. After 50 hours of operation the crankcase should be drained and refilled with oil as recommended in the Lubrication Section. Do not over fill.

Engine Accessories

See that all points requiring lubrication are properly lubed. Check the 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 30 foot-pounds torque.

Attaching Parts

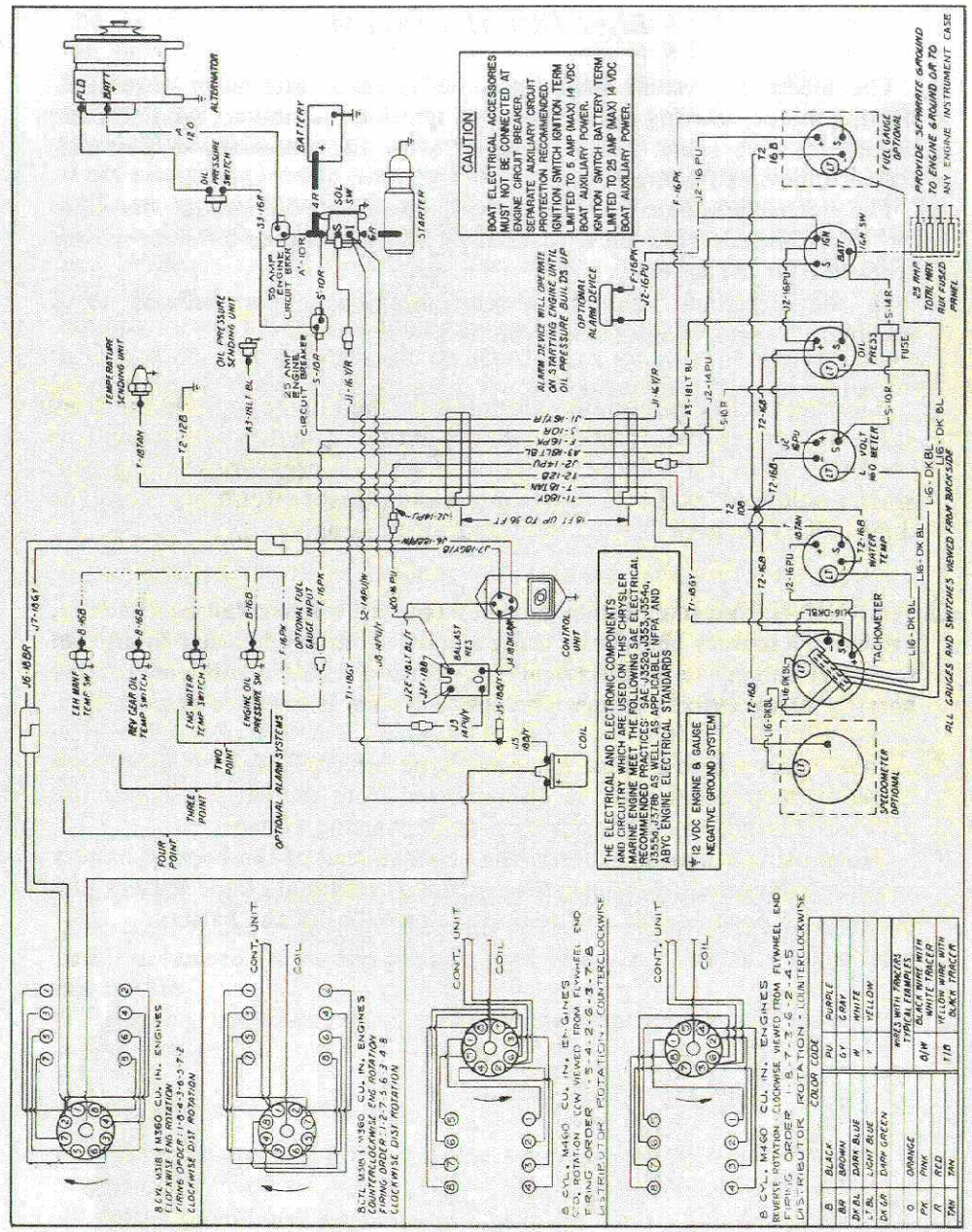
See that all nuts, bolts and screws that attach parts are secure.

Prestarting Instructions

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

Oil Level

Inspect the oil level and add oil, if required, in the engine and the reverse gear. Do not over fill.



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Prestarting Instructions

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Oil Level

Inspect the oil level and add oil, if required, in the engine and the reverse gear. Do not over fill.

Fuel

Check the fuel supply.

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 or installed.

Starting the Engine

1. Place gear control lever in neutral position.
2. Set throttle control approximately one-quarter open.
3. Turn ignition switch on.
4. Engage starter switch until engine starts, but not longer than fifteen seconds at a time.
5. Adjust throttle to produce a tachometer reading of 750-850 RPM.
6. Observe oil pressure gauge. If oil pressure gauge does not register after about 10 seconds, stop the engine and investigate.
7. 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.

Stopping the Engine

Close the throttle gradually and move control gear lever to neutral position. Allow engine to run at idling speed for approximately thirty 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 should be as shown for the particular model in the "Specifications" section of this manual. If a sudden drop in regulated oil pressure should occur, check the oil level in engine crankcase and add oil if necessary. If this does not alleviate the condition, the oil filter may be plugged and should be changed.

Minimum oil pressure at idle is 8 pounds.

Water Temperature

The thermostat will automatically maintain the water temperature of the cooling system 140 degrees on a raw water system and 180 degrees on a fresh water system. If the water temperature exceeds normal, by 40°F, stop the engine and investigate the water circulation system. Temperature may exceed the recommended maximum when first started up after a hard run.

△ 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 is running smoothly.

After a hard run, let the engine idle for at least 1 minute before turning off the ignition. This will prevent the engine from kicking back and drawing in exhaust gas or water.

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 usually indicated beforehand by unusual readings. In most instances, proper interpretation of the gauges, together with prompt action in making some slight adjustment 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 at the fittings may have developed as a result of vibration. Periodic water passage cleaning in salt or high silt area may be rquired. Exhaust hoses should have no tight bends or swags in the system. Proper drainage angle should be followed on engine installation.

LUBRICATION

Selection of Lubricant

The type of service for which an engine oil is intended is usually designated by the API service code SF or SF/CC. These symbols are service classifications established by the API (American Petroleum Institute). This system does not replace the SAE (Society of Automotive Engineers) grade number of the oil which indicates the viscosity of the oil.

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

1. An oil which conforms to the requirements of API Classification "For Service SF or SF/CC".
2. An oil of proper SAE number in accordance with the recommendations for the anticipated temperature:

SAE 30 or SAE 20-40 oils should be used when the anticipated atmospheric temperature will be above 32° F, SAE 20W in temperatures below 32°F. SAE 10W-30 oils may be used to ambient temperatures as low as +10°F. High hour engines or engine in tropics may use SAE 40 on SAE 20-50 oils.

☐ *Chrysler Corporation does not recommend the use of any lubricant which does not have both an "SAE" designation and an SF or SF/CC service classification on the container.*

The oil added to the engine at the factory should be retained for the first 50 hours of operation. If it becomes necessary to add oil during this initial period, an oil "For Service SF or SF/CC" 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 SF or SF/CC" should be made every 50 hours or two months, whichever occurs first.

☐ **Non-detergent or straight mineral oil should never be used.**

Between oil changes, **check the oil level daily.** The level indicator is of the bayonet type, with two marks, "Full" and "Add Oil". After the engine has been standing, the oil level should be at the "Full" mark. After the engine has started, this level will drop somewhat, due to the filling of oil passages and oil filter. A quart of oil should be added when the level is at or slightly below the "Add Oil" mark with the oil hot and sufficient time allowed for the oil to drain back into the pan. Do not run the engine with the oil level below the "Add Oil" mark, or above the "Full" mark.

Oil can be removed from the engine, either by draining or by suction, and should be changed when the engine is at normal operating temperature.

The full flow oil filter will trap non-fluid particles which are in suspension in the oil. Since it is not possible to determine how fast this material is accumulating, the oil filter should be replaced every 100 hours or 4 months of operation. Only oil filters with a safety valve, which permits oil to bypass the filter if it becomes clogged with foreign matter, should be used.

△ Daily

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

1. Examine the bilge for evidence of leaks. Remove any accumulation.
2. Examine fuel tank and lines for leaks or loose connection. Note any fuel requirements.
3. Examine all water connections for leaks.
4. Check the level of the oil in the engine. Bring up to level if necessary.
5. Start the engine and examine the fuel lines from the fuel pump to the carburetor 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. Remove the rotor every 100 hours and place two or three drops of light engine oil on felt wick in top of cam.
2. Lubricate each joint of all linkages to the throttle, reverse gear and steering as necessary for easy operation from the helmsman's position.

☐ After 50 Hours of Operation or Once Each Month

In addition to performing the Daily and 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 1.220, the battery should be recharged. If the gravity reading is over 1.270, the charging system should be checked by a Chrysler

Marine Distributor-Dealer. Also, clean the battery terminal connections if necessary. Check hold-down brackets for tightness.

4. Remove, and clean flame arrestor. Flame arrestor must be dry when reassembled and installed. (Every 100 hours.)

MAINTENANCE SCHEDULE

ENGINE:	Daily	25 hrs.	50 hrs.	100 hrs.	250 hrs.
Oil – Check and add as required. Do not overfill	X				
Oil Change – see note			X		
Oil Filter – Aways replace every second oil change				X	
Oil Cooler – Inspect: clean as required			X		
Controls and Linkage – Check, oil as required	X				
Crankcase Vent Valve – Replace					X
Fuel – Leaded or non-leaded	X				
Fuel Filter – replace				X	
Fuel Lines – inspect for leaks	x				
Compression – When problem is indicated check when engine is warm at engine starter RPM					
Belts – Inspect – No more than¼"-½" deflection	X				
Spark Plugs – Inspect and replace SEE P. 30 "250 HRS"				X	
Distributor Rotor Felt Wick				X	
Flame Arrestor – Clean with solvent				X	
Battery – Check water			X		
Instruments – Check gauges for operation	X				
TRANSMISSION					
Reverse Gear and V-Drive	**Daily**	**25 hrs.**	**50 hrs.**	**100 hrs.**	**250 hrs.**
Fluid – Check and add as required	X				
Fluid – Change and clean oil screen					X
Oil Cooler – inspect; clean as required			X		

Cooling System

☐ All hose connections and fittings should be regularly inspected for tightness and the condition of hoses checked. Transmission oil cooler should be inspected every 50 hours and the internal cooling tubes cleaned.

Chrysler Marine Division recommends the use of a sea strainer properly installed to provide an unrestricted flow of filtered water to the engine but cautions that inspection and cleaning of the oil coolers is still required at the recommended 50-hour interval.

Where boat is continuously operated in areas with seaweed, sea grass etc. or other conditions which would increase the intake of foreign matter into the engine's water supply, the oil coolers and sea strainers should be cleaned more frequently.

Responsibility for maintaining an unrestricted flow of clean water to the engine is owner responsibility. Damages occurring as a result of water restriction or pollution are owner responsibility.

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

RECOMMENDED SPARE PARTS KIT

Accessory drive belt(s)	Fuel filter
Spark plugs	Cooling system hoses
Ignition cables	Basic tools
Distributor rotor & cap	Extra engine & transmission fluids

• IMPELLOR W/GASKET
• BALLAST RESISTOR

TROUBLE SHOOTING

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

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

Starter Will Not Turn Engine

Loose or Corroded Battery Terminals — Clean terminals and clamps, replace if necessary. Tighten clamps securely. Apply a light film of vaseline to the battery terminals to retard oxidation.

Battery Not Full Charged — Test the electrolyte in the battery. Check

battery specific gravity. Check for dead cell. Replace or recharge battery, as required.

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

Starter Switch Defective — Replace switch.

Open Circuit in Wiring — Inspect and test all wiring.

Inoperative Starter — Inspect the starting motor for loose brush holders, worn or corroded brushes or corrosion on the commutator. Failure of the starting motor to operate indicates poor brush contact or an open circuit in the motor winding. Repair or replace the starting motor as required.

Starter Turns but Drive Pinion Does Not Engage

Starter Drive Slipping — Replace drive.

Broken Teeth on Flywheel Drive Gear — Replace flywheel ring gear (see your Chrysler Distributor or Dealer).

Broken Teeth on Starter Drive Pinion — Replace drive.

Armature Shaft Rusted, Dirty or Dry, Due to Lack of Lubrication — Clean, test and lubricate.

Starter Operates But Will Not Disengage When Starter Switch is Released

Defective Drive — Replace drive.

Starter Pinion Jams or Binds

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

Broken or Chipped Teeth on Flywheel Ring Gear—(See your Chrysler Distributor or Dealer).

Starter Will Turn Engine But Engine Will Not Start

Dirt and Moisture on Ignition Wires and Distributor Cap—Be sure that the distributor cap and coil are clean, especially in and around the towers. Dirt and grease can soak up moisture and can easily cause a short. Check for a cracked cap, arcing at the distributor cap contacts, burned rotor. If any cable terminals are corroded be sure to clean or replace them. 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. Inside of cap should also be clean and dry.

Electronic Ignition System

Incorrect air gap between distributor reluctor and the pick-up coil pole piece. Air gap between pick-up pole piece and tooth of distributor reluctor should be .006" to .008" measured with a **non-magnetic** feeler gage. Pick-up coil attaching screw must be tightened after adjustment.

Ignition Coil Failure—Replace coil and inspect ignition system for possible cause of failure; check ignition distributor cap for indications of arcing at the distributor cap towers; check distributor cap inserts and rotor for electrical erosion; check resistance of ballast resistor. Replace components as necessary to prevent recurrence of coil failure.

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

Adjust Carburetor. *Limit cold idle time.*

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, moisture in Distributor.
3. Low compression. (See your Chrysler Distributor or Dealer.)

Intermittent Misfiring

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

Engine Backfires

1. Spark plug cables improperly installed.
2. Intermittent fuel supply, dirt or water in system. Clogged fuel filter.
3. Excessive oil fill.
4. Leak in intake manifold gasket or carburetor flange gasket.
5. C.C.V. valve stuck.
6. Fouled spark plugs and improper heat range.
7. Compression low.
8. Incorrect or faulty thermostat causing engine to run cold.
9. Stuck intake valve.
10. Ignition timing incorrect.

Engine Knocks or Pings

(Most noticeable on quick acceleration or at full throttle)

1. Low octane fuel.
2. Excessive 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.
5. Loose flywheel.
6. Prop shaft alignment

Fuel System Difficulties

Fuel Does Not Reach Carburetor

1. Defective fuel pump.
2. Out of fuel; tank empty.
3. Vent pipe in fuel tank clogged.
4. Shut-off valve closed.
5. Fuel lines restricted.
6. Vapor lock (warm weather).
7. Plugged fuel filter.
8. Blockage at anti-siphon valve at fuel tank
9. Air leak in fuel line or filter.

Fuel Pump Not Operating

1. Inspect for Diaphragm or Return Spring Failure—(See your Chrysler Distributor or Dealer.)

2. 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 approximately 1/5 pint.

3. Pump pressure at W.O.T should be 4-1/2 to 6 PSI.

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:

1. The carburetor may be out of adjustment.
2. The float level may be too low or float valve stuck on the seat.
3. Carburetor fuel jets or passages clogged with dirt or gum.

Engine Flooded

If the spark plugs are wet, this indicates the engine is flooded. Open the throttle fully and crank the engine, keep hand on throttle control so that "over-running" does not occur upon starting.

Electronic Ignition Distributor

No Periodic Adjustment Required

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. **Do not wipe with oily rag.**

Ignition Timing — Timing Light Method

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

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 at 450 to 500 RPM.
3. Loosen the distributor clamp screw and rotate the distributor housing so that the specified timing mark and pointer are in alignment as per specifications.
4. Tighten distributor clamp screw after timing has been set and recheck timing adjustment with timing light.
5. Advance throttle and check for smooth distributor advance movement.

Carburetor Idle Adjustments

1. With engine fully warmed up, set idle speed screw for desired idle speed (600 to 700 RPM in gear recommended). Open the idle mixture screws one turn (do not damage seat by over tightening) as a starting point for adjustment.
2. Set idle mixture screws for maximum intake manifold vacuum, and smoothest running.
3. Re-set idle speed to desired RPM.

Spark Plugs

To insure peak engine performance, spark plugs should be removed, cleaned, tested and regapped every 250 hours of operation. Worn and dirty plugs may give satisfactory operation at idling speed but may fail under operating conditions.

FINAL DRIVE

Reverse and Reduction Gear

The reverse gear 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.

Oil Level

Using the dipstick, check the oil daily 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 annually.

After draining the oil from the reverse gear, the removable oil screen should be thoroughly cleaned. The oil screen is held in place by the oil cooler hose connector bushing located at the right front corner of the transmission case.

Oil Type

Refill the reverse gear with automatic transmission fluid. Type labeled Dexron Automatic Transmission Fluid or Chrysler Automatic Transmission fluid, AQ-ATF-2848A should be used. If the Dexron type fluids are not available, type "A" Suffix "A" may be used. 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 oil cooler and the cooler hoses. Shut off the engine 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.

Reverse Gear Oil Cooling

Since the oil is separate from the engine oil, the reverse gear oil is directed to a separate oil cooler.

Operation

☐ Always start the engine in neutral thereby avoiding moving the boat in either direction. Never shove off until the engine is operating smoothly. Gear shifting should be at engine speeds below 1000 RPM and preferably in the 700 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. Do not idle excessively.

In order to ensure trouble-free operation and extended life of the reverse gear, it is extremely important that the engine be maintained in correct alignment with the propeller shaft. Alignment should be checked after the boat has been in the water for at least 24 hours. Clean the mating surfaces of the reverse (or reduction) gear output flange and the propeller shaft flange. Hold a .002 inch feeler gauge against the reverse gear flange, in a perpendicular position corresponding to the hand on a clock at 12 o'clock. 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 try the gauge at the three, six and nine o'clock position. When the drag is equal at all four positions, the alignment is proper. A difference in feel at six and twelve o'clock positions indicates that the fore and aft height of the engine needs adjustment. A difference

in feel at the three and nine o'clock positions indicates that the engine should be shifted to the right or left.

Engine should never be operated with a bent or misaligned shaft, or a damaged propeller.

Correct adjustment of the shift control mechanism is also important to the life and operation of the reverse gear. Selection of gear positions at the helm control should result in full travel of the gear shift lever on the reverse gear (Figure 11). Shift lever should move completely into the Forward, Neutral and Reverse detent positions. Incomplete lever travel can cause slipping clutches and premature failure of the reverse gear.

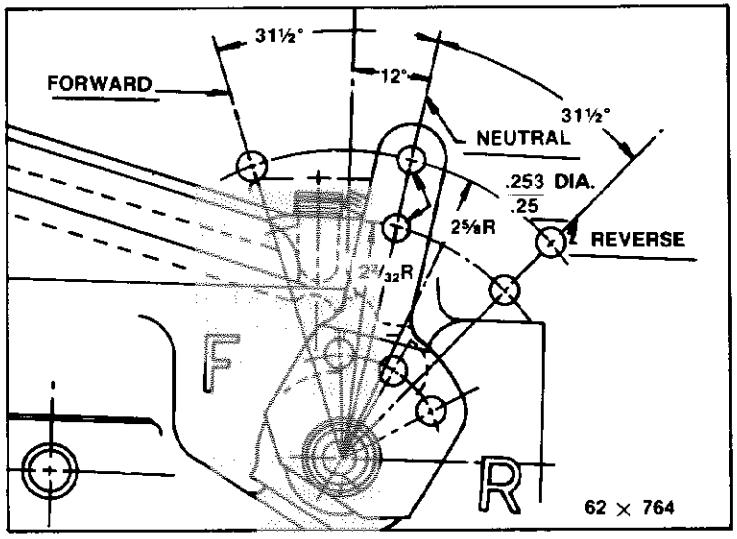

Figure 11 — Shift Lever Operation

LAYING UP AND FITTING OUT

Laying Up

☐ During the running season, many owners make use of the engine room log, similar to that shown at the back of this book, to determine what maintenance schedule change may be necessary to adapt the schedule to suit local conditions, the particular vessel, or certain operating conditions.

Prior to lay-up, some owners have a thorough inspection made at their Chrysler Marine Distributor or Dealer. 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.

Chrysler Engine Oil Supplement, Part No. 3419131, 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. It is recommended that oil be drained while engine is at normal operating temperature, as the warm oil will drain more readily and completely, carrying with it foreign matter which might otherwise cling to sides of crankcase and internal parts of the engine. Fill crankcase with recommended type of oil of appropriate grade for the anticipated outside temperature. Refer to Lubrication Section for recommendations. Included in the initial fill add one pint Engine Oil Supplement Concentrate, Chrysler Part No. 3419130 to the crankcase, to obtain the best corrosion protection.
3. Shut off the fuel valves at the gas tank. 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 Chrysler Fuel Detergent and Valve Lubricant, Part No. 4318003.
4. Start the engine and run at fast idle, approximately 1200 RPM, until the fuel pump picks up all of the fuel detergent. This removes varnish, and will prevent varnish from forming in carburetor and fuel system. While engine is running, remove flame arrestor and squirt Oil Supplement 3419130 (reduced 8 to 1 with engine oil) down through the carburetor. Run until engine stalls from lack of fuel.
5. Remove the spark plugs and disconnect the ignition coil wire. Using an oil squirt can, spray approximately one ounce of oil supplement 3419130 (cut 8 to 1 with engine oil) into each cylinder.

☐ **NOTE: Do not put more than specified amount of detergent 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.

COOLING SYSTEM PROTECTION

Raw Water Cooling System

☐ Where practical the boat should be removed from the water, bow first, to ensure complete drainage of the exhaust system. If the boat is lifted vertically, the same result can be accomplished by keeping the bow higher than the stern.

1. Flush the cooling system with fresh water. Flushing the cooling system prior to draining is desirable, particularly for engines in boats operating in sea water in order to flush out sediment before it dries.
2. Drain the impeller type water pump, by loosening the end cover.

☐ **NOTE: If the rubber impellers are allowed to stay in the pump during the lay-up period they will become set and will not function properly in further use. It is recommended that the impellers be removed from the pump.**

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

☐ **NOTE: Where the angle of engine installation will not allow complete drainage of the cylinder block through the side drain plug holes the following procedure should be followed to ensure cylinder block protection: Remove cylinder block drain plugs and drain out as much water as possible. Replace drain plugs, remove thermostat housing and thermostat and add anti-freeze through the opening to completely fill the cylinder block.**

△ **CAUTION: Use only alcohol based anti-freeze; permanent type glycol base anti-freeze does not readily mix with water unless agitated and should not be used.**

Replace thermostat and thermostat housing.

5. Drain exhaust elbows (and exhaust risers where used) by removing the drain plugs.
6. Drain the exhaust manifolds where drain plugs are used. If there are no drain plugs the hoses at the bottom rear of the manifolds must be disconnected.
7. Disconnect water hose from lower end of transmission cooler.
8. Loosen the belt tension on all belts.

☐ Fresh Water Cooling System

Each fall, to assure maximum efficiency of the fresh water cooling system, the following procedures should be observed:

Drain, flush and refill cooling system. If the system contains a considerable amount of sediment, clean and flush with a reliable cooling system cleaner. Follow with a thorough rinsing to remove all deposits.

Drain system by removing plugs from each side of engine. Also remove hose from bottom of heat exchanger.

Refill system with a solution of 50% water and 50% high quality, permanent type anti-freeze for anti-freeze, antirust and water pump lubrication protection.

Coolant level should be about 1-1/4" below filler neck.

Run engine until heat of engine up to normal temperature and top off.

The raw water circuit of the fresh water cooling system must also be drained and serviced as shown in the preceding instructions for "Raw Water Cooling System."

With coolant recovery type systems recovery, tank should be filled to full mark when engine cold.

CAUTION: Do not overfill.

☐ Fuel System Protection

1. Remove, clean and reinstall the carburetor flame arrestor. To protect the carburetor and intake system the flame arrestor intake may be sealed with masking tape or both carburetor and flame arrestor can be enclosed using an air tight plastic bag.
2. Fuel Tank vents should be sealed to prevent entry of moisture and foreign material.
3. Plug or tape the exhaust outlets to prevent entry of moisture, dust, etc.

☐ Electrical System Protection

1. Remove the battery or batteries for storage ashore where they should be checked and charged periodically. Battery cases and battery boxes should be washed with a soda solution to remove all traces of corrosion and acid.
2. All electrical wiring and terminals should be wiped clean and all electrical connections sprayed with moisture proofing agent such as CRC or equivalent.

All engine control linkages should be inspected for wear, proper adjustment and protection from rust and corrosion.

Warner Velvet Drive

Change transmission oil and clean oil screen. See page 30.

Fitting Out After Lay-Up

In the foregoing Lay-Up procedure the engine crankcase was filled with fresh oil, new oil filter installed and all openings sealed against the entrance of moisture, dust or other foreign material. Remove covers and seals from all openings; replace all drain plugs, connect all water hoses and reinstall raw water pump impellers. Adjust all drive belts to proper tension.

Install battery (or batteries) making sure that battery posts and cable connectors are clean and bright. After tightening securely, a light film of petroleum jelly should be applied to minimize corrosion.

Remove the spark plugs and with the ignition coil wire disconnected, (Caution: Ground coil high tension wire to prevent sparking) crank the engine to expel the oil from the cylinders, and install new spark plugs if necessary.

Start the engine, observe all engine gauges for normal readings. Notice exhaust outlet for water discharge in a normal length of time. While engine is warming up, check fuel and cooling system for leaks.

Reverse Gears

Engine to propeller shaft alignment should be checked after the boat has been in the water for several days. While this is mandatory for wooden hull boats it is equally important for both fiberglass and metal hull boats.

See Page 31 for propeller shaft alignment procedure.

ENGINE ROOM LOG

Date	Engine Started	Engine Stopped	Total Hours Accumulated Trip Hrs.	Trip Min.	Total On Engine Hrs.	Total On Engine Min.	Oil On Hrs.	Oil Min.	Fuel Tank	Maintenance and Other Data
3-15-86	Forwarded from Previous Page				290	40	49	30		Oil Change
3-25-86	7:00 A.M. 12:00	10:00 A.M. 5:30 P.M.	3 5	 30	299	10	8	30	15	Daily Inspection Pleasure Trip
4-10-86	6:00 A.M. 10:00 A.M.	9:30 A.M. 2:30 P.M.	3 4	30 30	307	10	16	30	11	50 Hr. O.K. Drift Fishing
4-11-86	8:00 A.M. 12:30 P.M.	11:30 A.M. 3:00 P.M.	3 2	30 30	313	10	22	30	9	Daily O.K. Sea Calm—Trolling
4-15-86	Carry Forward				313	10	22	30	9	

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