

OWNER'S MANUAL

WESTERBEKE

Vire 7 Marine Engine



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LIST OF FIGURES

- Figure 1. Starboard View Vire 7
- Figure 2. Port View Vire 7
- Figure 3. Installation Drawing
- Figure 4. Exhaust Pipe and Cooling System
- Figure 5. Electrical Wiring Diagram
- Figure 6. Carburetor
- Figure 7. Magneto Wiring Diagram
- Figure 8. Flywheel Magneto
- Figure 9. Tightening Flywheel

TABLE OF CONTENTS

Engine Photographs.	4
Technical Data.	6
Installation Drawing.	7
Installing the Engine in the Boat	
The Engine Bed	
Installation of Engine and Propeller Shaft	
Exhaust Pipe and Cooling System.	8
Other Things to Remember.	10
Fuel and Running	
Fuels	
Starting (cold engine)	
Starting (warm engine)	
Starting	
Running - in of Engine.	11
Stopping	
Construction	
General	
Engine	
Cooling.	13
Carburetor	
Magneto	
Starter Generator.	14
Reverse/Reduction Gear	
Maintenance.	15
Beginning of the Boating Season	
Maintenance Intervals	
Reverse/Reduction Gear Lubrication	
Checking the Spark Plug	
Drying the Wet Magneto.	16
Cleaning the Carburetor Strainer	
Cleaning the Carburetor	
Cleaning the Air Filter	
Adjustments	
Adjusting the Carburetor	
Adjusting the Magneto Breaker Point Gap.	17
Adjusting the Ignition Timing	
Assembly Instructions.	18
Dismantling the Engine	
Assembling the Engine	
Dismantling the Reverse/Reduction Gear Box.	19
Assembling the Reverse/Reduction Gear Box	
Storage of Engine.	20
Fault Finding Chart.	21
Parts List.	23

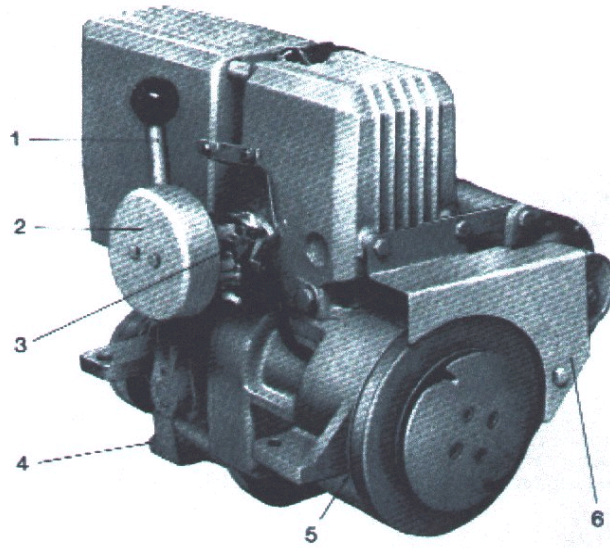


Figure 2 Port View Vire 7

1. Forward and Reverse Lever
2. Air Filter
3. Carburetor
4. Gear Box Oil Drainage Plug
5. Timing Marker
6. Pulley Belt Cover
7. Spark Plug

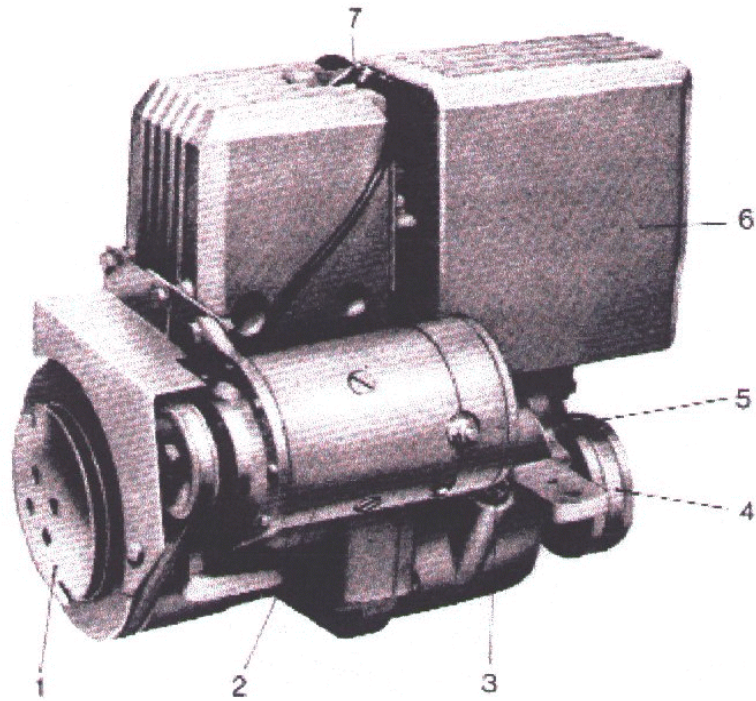


Figure 2. Port View Vire 7

1. Pulley
2. Starter Generator
3. Reverse/Reduction Gear Oil Filling and Inspection Gap
4. Gear Flange
5. Cooling Water Suction Inlet
6. Exhaust Collector
7. Spark Plug

TECHNICAL DATA

ENGINE

Number of Cylinders	1
Type	Two-Stroke
Bore	(3.75 in.)
Stroke	(2.756 in.)
Volume	16.3 cu. in.
Compression Ratio	6.5:1
Output/RPM	7 HP/3000 RPM
Cooling	Raw water through gear type pump
Fuel	Diaphragm type in connection with carburetor, operated by pressure fluctuations in crankcase
Carburetor	Tillotson HL
Fuel	3 to 3.5 % oil/gasoline mixture or oil/gasoline/kerosene mixture, of which 3 to 3.5 % oil. 15 to 20% gasoline and the rest kerosene (gasoline 92 oct.)
Engine Lubrication	Two-stroke engine oil
Reverse/Reduction Gear Lubrication	SAE 140 IN TEMPERATURES ABOVE +10o C SAE 90 in temperatures below +10o C
Fuel Consumption (continuous drive)	2.6 to 3.2 Qts/hr
Spark Plug (in normal conditions and temperate climate)	Bosch W 175 ZIM Champion L-86 AC M 44 F Autolite AE 6 NGK B-7H or similar
	(In exceptional conditions use either next hotter plug - light work, cold conditions - or next colder plug - heavy work, hot conditions)
Spark Plug Gap	0.5 mm (0.020 in.)
Fly Wheel Magneto	Bosch, light output 6V/16W
Magneto Breaker Cap	0.45 mm (0.016 in.)
Ignition Timing	30o
Motor Generator	12 V / 14A max.
Reverse/Reduction Gear	gear ratio 2:1

FITS AND CLEARANCES

Piston/Cylinder	6.06 - 0.09mm (.002 in. / .0035 in.)
End Gap of Piston Ring	0.15 - 0.35 mm (.006 in. / .014 in.)
Side Clearance of Upper Piston Ring in Groove	0.060 - 0.085 mm (.002 in. / .003 in.)

Side Clearance of Other Piston	
Rings in Groove	0.050 - 0.075
Pressure Fit of Gudgeon Pin to Piston	0.002 - 0.007 mm
Piston Clearance in Bush	0.006 - 0.028 mm (.0002 in. / .001 in.)
Side Play of Connecting Rod to Crankshaft	0.20 - 0.30 mm (.008 in. / .012 in.)
End Play of Screw Shaft	Approx. 0.1 mm (.004 in.)

INSTALLING THE ENGINE IN THE BOAT

To ensure proper functioning of the engine, extreme carefulness is called for in installation. To facilitate installation, the engine can be tilted longitudinally; however, this tilting must not exceed 10° (5° is recommended).

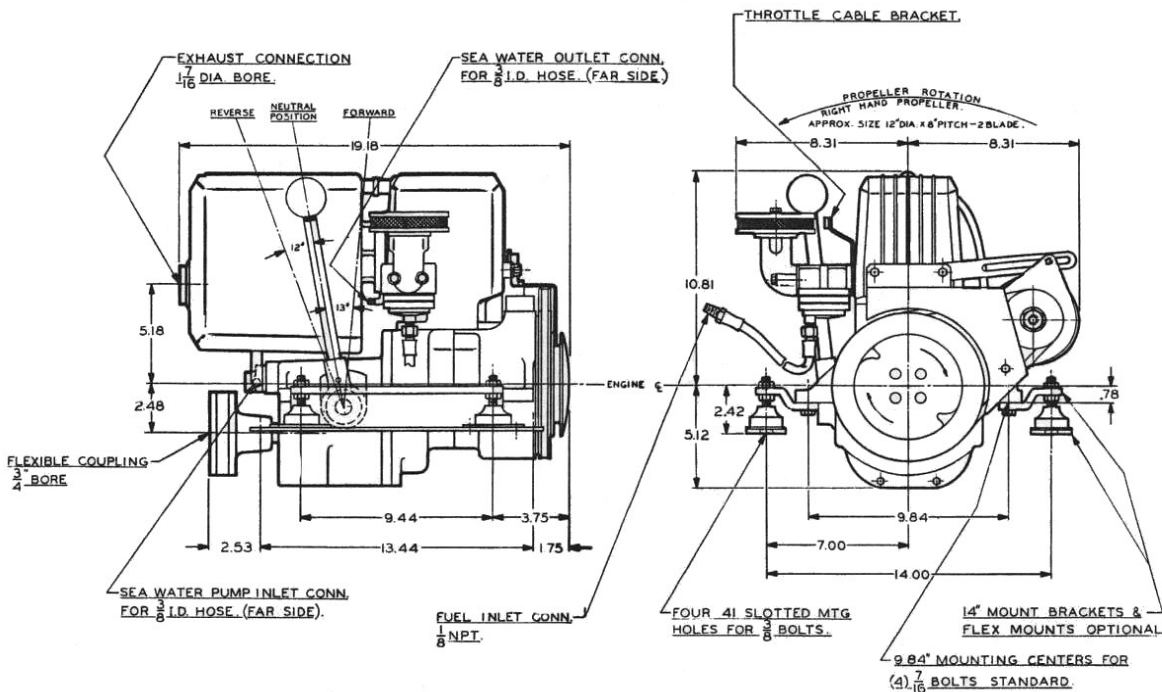


Figure 3

Figure 3, above, will give the most important measurements to be taken into account when installing an engine.

The engine Bed

The engine bed should be as rugged as possible and of solid construction. Longitudinally, the bed should be as long as possible so that the strain caused by the running engine is distributed on as many frames (ribs) as possible. In addition, the bed must be firmly fixed to the transverse members.

In fiberglass hulls, we recommend that similar wooden stringers be formed and fitted, then glassed to the hull securely. This allows hanger bolts to be installed firmly in wood, thus reducing noise and transmitted vibrations.

The temptation to install the engine on a pair of fiberglass "angle irons" should be resisted. Such construction will allow engine vibrations to pass through to the hull.

Installation of Engine and Propeller Shaft

It is extremely important that the propeller shaft and the power take-off shaft (gear box screw shaft) are completely aligned and centered.

The propeller shaft does not require a special pressure bearing because the screw shaft bearing absorbs axial loads also. First install the above shafts to align alignment and centering is done by moving the engine.

Before the final engine installation check, fasten engine to bed but leave gear flange screws unfastened. The engine is correctly installed when the coupling flanges are completely parallel and centered. Alignment of flanges is checked by a feeler gauge. If the distance between the flanges is not the same in all directions, adjustment is made by changing the position of the engine. After fastening the coupling turn the propeller shaft with the gear lever in neutral position. If the propeller shaft moves freely and evenly, the installation is correct. If a sternpost tube with a rubber sleeve mounted front bearing is used, it is important that the propeller shaft front is carefully centered into the sternpost tube before final inspection. The centering is best achieved by disconnecting the sleeve, sliding the bearing assembly forward and locating the shaft in the tube with small wedges.

It is recommended that the engine bed is made so high that thin shims can be placed between the engine and the engine bed to get the engine installed at the correct height.

If the initial alignment is accomplished during boat construction or while the boat is still on its cradle, the coupling should be disconnected and all alignment rechecked shortly after launching.

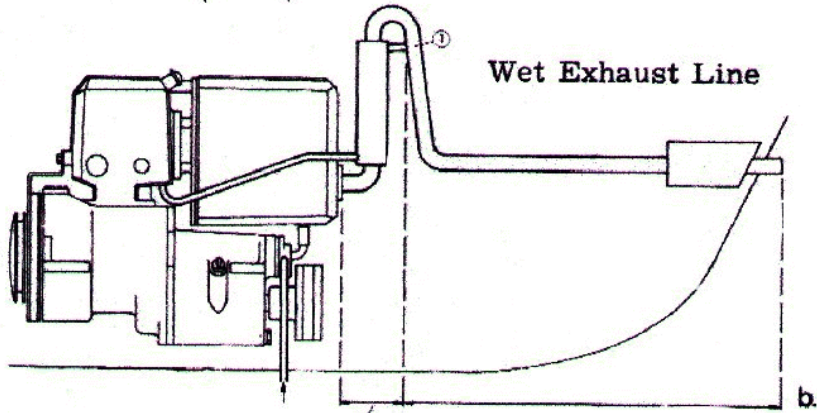
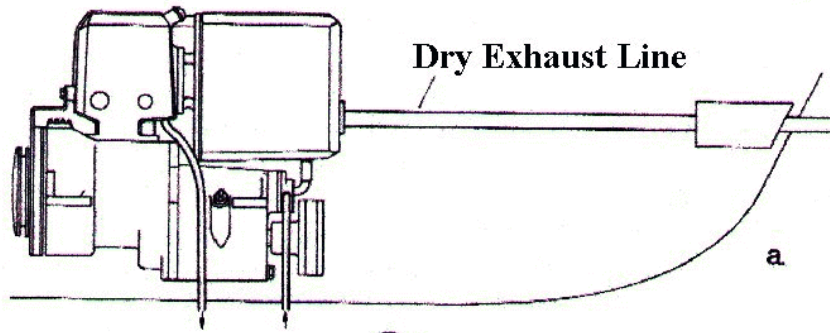
The engine alignment should be rechecked after the boat has been in service for one to three weeks, and if necessary, the alignment remade. It will usually be found that the engine is no longer in alignment; this is not because the work was improperly done at first, but because the boat has taken some time to take its final shape and the engine bed has probably absorbed some moisture, requiring the removal or addition of shims to keep the engine in its proper position.

Exhaust Pipe and Cooling System

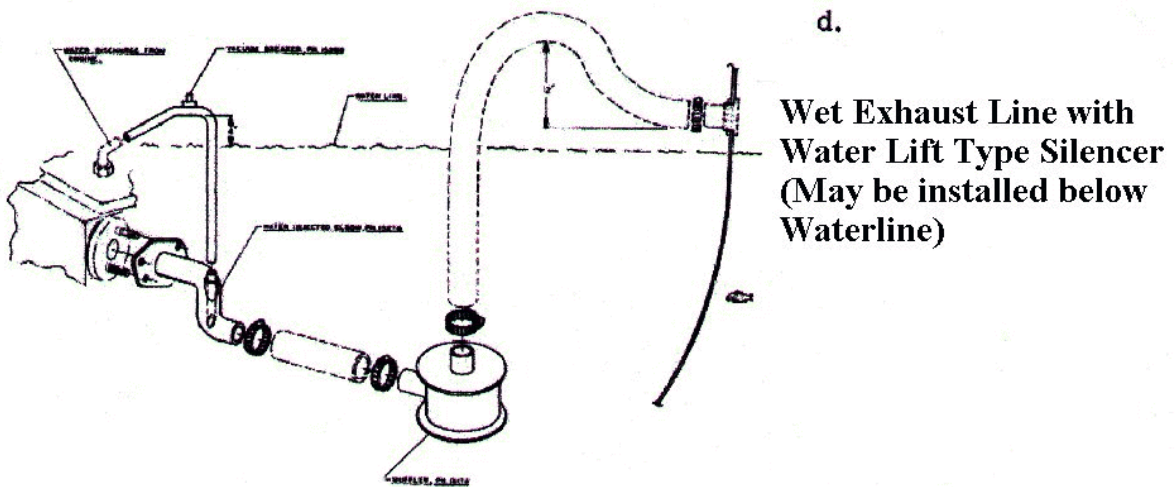
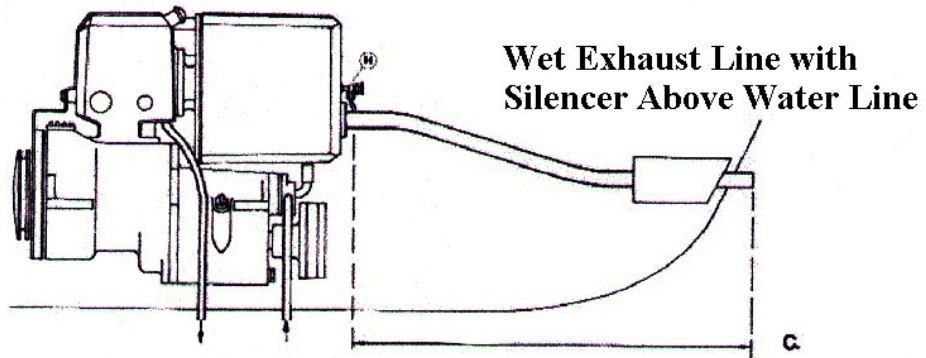
In spite of the cooling through the water casing, exhaust gases from the exhaust collector are still hot: up to 300°C depending on load. If a hot exhaust pipe is not inconvenient it is possible to “draw” a dry exhaust pipe and lead the cooling water directly from the cylinder and out through the boat side (Fig. 4.A). Usually a hot exhaust pipe is avoided because of fire hazard and heat radiation. Figure 4. B shows an exhaust system which is recommended when the cooling water is led out through the exhaust pipe. The part of the exhaust pipe closest to the exhaust collector should be raised to a level where seawater cannot enter the engine through the exhaust pipe. From the highest point the exhaust pipe is further led as shown in figure 4. B.

If the use of a water casing at the raised portion of the exhaust pipe is not desired (as shown in Fig. 4. B), the cooling water can be led directly to the exhaust pipe at point 1. In this case the raised part of the exhaust pipe is hot and should be insulated. Since the temperature of the cooled part of the exhaust pipe does not exceed 100° C, a flexible pipe of suitable plastic or rubber compound can be used (check with supplier).

In some cases it may be difficult to raise the exhaust pipe as suggested; in that case proceed as described in Figure 4. A. In case the cooling of the exhaust pipe is necessary, it can be arranged by leading a small portion of the cooling water through a control cock into the exhaust pipe (Fig. 4. C). In this case, most of the cooling water is led directly from the cylinder out through the boat side. A disadvantage of this application is that you have to remember to open the cock before use and to close it after use in case the engine is located below or at water level. The exhaust pipe is to be installed so that water entering the exhaust pipe or forming through condensation does not enter the engine.



Jacketed Exhaust Line



Other Things to Remember

Absolute cleanliness is required when installing the fuel line. As fuel line material 1/4 in. Plastic hose may be used (check local requirements and with insurance company, if acceptable). The ignition cables must not touch the hot engine parts as this may damage insulation. If the engine is installed in a confined space (e.g., a sailboat) adequate ventilation has to be provided (fire hazard).

Battery is to be installed in a well ventilated space which is protected against moisture and preferably insulated. The battery is to be fastened securely. Electric equipment and wiring are to be installed so that vibration and moisture cannot cause malfunction.

The electric wiring diagram is shown in Figure 5.

FUEL AND RUNNING

Fuels

Any regular grade of gasoline may be used (preferably 92 oct.). The gasoline should always be mixed with two-stroke engine oil mixture: 3 to 3.5% (1/4 pint) of oil to one gallon of gasoline or 1/4 pinto of oil, 1-2/5 pints of gasoline and the rest of the gallon kerosene. Starting, however, requires gasoline-oil mixture. More soot will form when using a mixture of kerosene-gasoline-oil, as opposed to a mixture of gasoline.

Starting

Refer to "Maintenance - Beginning of the boating season" page and the starting checks are as follows:

1. Check fuel level in tank
2. Check that the gear lever is in neutral.
3. Turn on the fuel cock. When a mobile tank is used, prime the carburetor by operating hand pump until definite resistance is felt.
4. Move the choke lever into a vertical position.
5. Open the throttle approximately one third.
6. Start the engine by turning the ignition key. (Manual Start - Wind the starting rope evenly but vigorously until free.)
7. After the engine has fired, remove the choke gradually and adjust engine RPM.
8. If exhaust gas cooling has been installed as shown in Figure 4. C, open the cooling valve cock sufficiently to change all water entering the exhaust pipe into steam. The cock has been sufficiently opened when exhaust gases are accompanied by steam only and no water drops.

Starting (warm engine)

The starting operation is conducted as above with the exception that no choke is to be used.

If for some reason the choke has been used, and the engine does not fire, proceed as follows:

Make sure that the choke is not on, open the throttle fully and turn the engine a few times. After the engine has started, adjust RPM. The best way to ensure firing of a very warm engine is to have the throttle fully opened.

Engine Speed and Maneuvering of Reverse/Reduction Gear

1. Open the throttle so that the engine runs slightly faster than in neutral.
2. Engage the gear in required direction.
3. Set required speed by adjusting the throttle.

Attention!

Engaging the gear for forward or reverse should be done at lowest possible RPM. To prevent clutch cone damage.

Running-In of engine

Careful use during the first ten hours will increase engine life time. During this time avoid heavy loads and top RPM.

Full engine power will be reached only after the engine parts have become smoother. This smoothing process takes place during the first fifty hours or so.

Stopping

1. Move the throttle to idling position.
2. Place the gear lever in neutral position
3. Turn off ignition.
4. Close fuel cock.
5. If exhaust pipe cooling had been installed as shown in Figure 5. C, close the water cock (H).

CONSTRUCTION

General

The Vire 7 engine has been designed for marine use only. It is equipped with a reverse/reduction gear. By means of a hand gear lever forward-neutral-reverse is engaged. The reduction gear ratio is 2:1 and in forward gear the propeller is turning in opposite direction of the engine. Ignition is provided through a flywheel magneto from which electricity for lighting purposes may also be derived (6V/16W).

The engine is provided with a 12V / 14A max. motor generator. The carburetor is of diaphragm type, which guarantees fuel supply regardless of engine position.

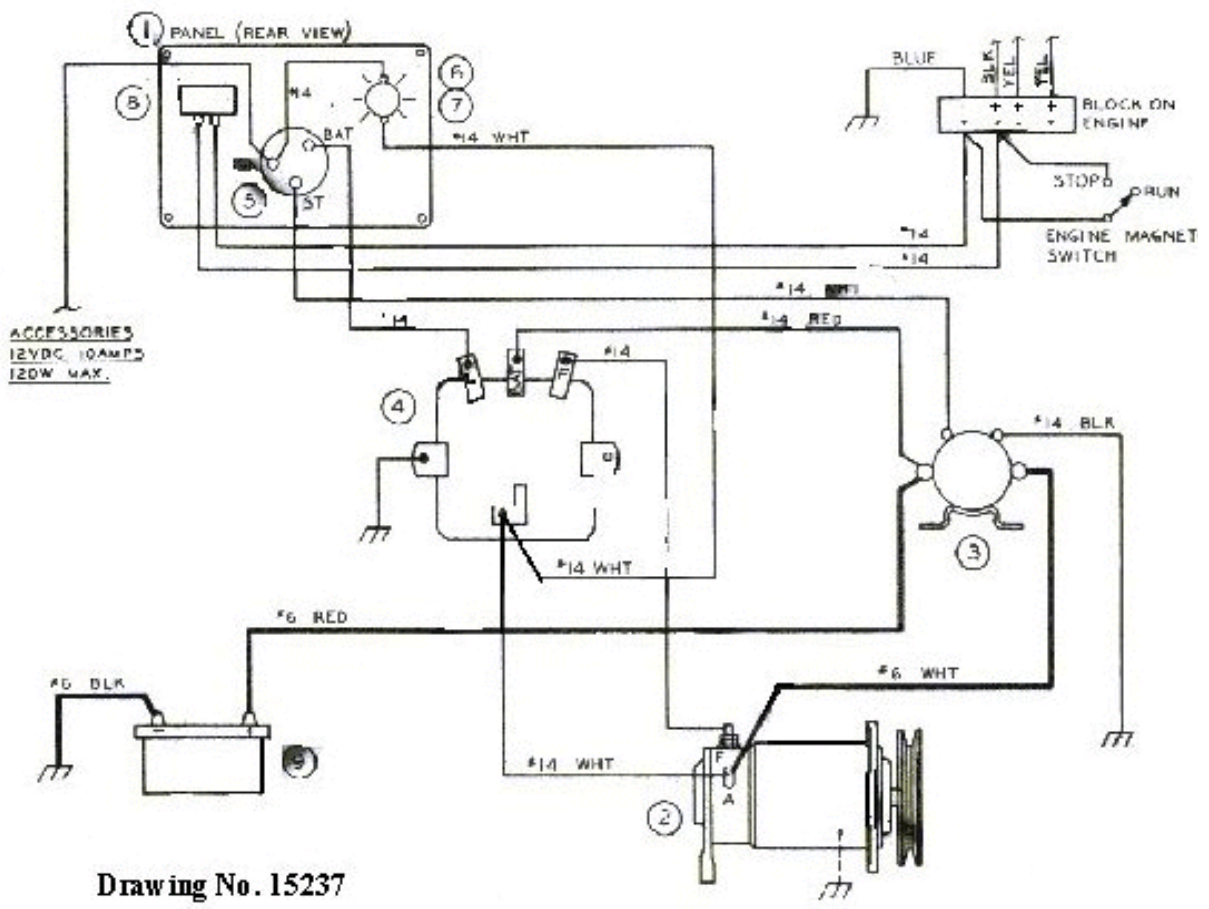
The circulation of cooling water is done by gear wheel pump.

The cooling system does not include a thermostat.

Engine

The engine is a water-cooled one-cylinder two-stroke engine. The cylinder head and the cylinder have been cast in one piece.

To ensure even HP output, an exhaust collector with a cooling casing has been permanently fastened to the engine. Such a collector is necessary in a two-stroke engine as the exhaust pipe system length, diameter, shape and/or muffler arrangements may vary considerably. To avoid weight, the exhaust collector has been made of corrosion resistant light metal. This makes the cooling casing necessary. This casing decreases heat radiation to engine compartment and cools exhaust gases.



Drawing No. 15237

Figure 5 - Electrical Wiring

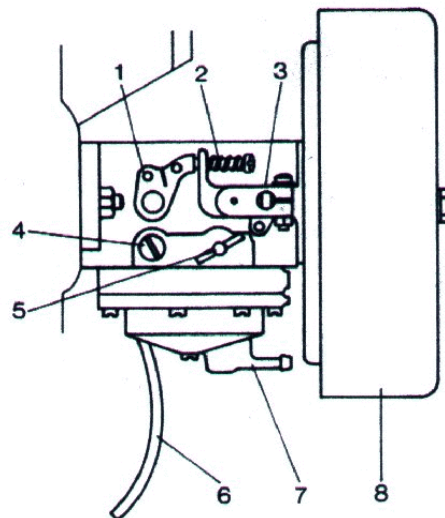
Cooling

A rubber gear type cooling water pump has been installed in the reverse/reduction gear. This pump draws water from under the boat and pushes it through the casing the exhaust collector first and through the cylinder casing after that. The water leaves the engine from the top of the cylinder casing which prevents formation of air in the cylinder casing. The cooling water is slightly pre-warmed in the exhaust collector. The cooling water from the cylinder can be exhausted either directly or through the exhaust gas pipe. In the latter case the exhaust gas pipe has to be constructed so as to prevent water from entering the engine (see installation instructions: "Exhaust Pipe and Cooling System"). In case the cooling water is led to the exhaust gas pipe, a part of This pipe can be made of flexible material such as rubber or plastic, which facilitates installation.

To remove water from cylinder casing and exhaust collector both are equipped with screw plugs.

Carburetor

For the purpose of propelling fuel the carburetor has a diaphragm pump which gets its power from the pressure changes in the crank case (over-pressure/under-pressure). The fuel comes



through the bottom filter to the diaphragm pump and from there on to the chamber in the middle of the carburetor, which is also connected with the jets. When the chamber is filled, its membrane type bottom will cause the fuel valve to close, thus stopping further fuel from entering.

To achieve a richer mixture when starting a cold engine, the air suction is reduced by the choke valve.

Figure 6. Carburetor

- | | |
|-------------------------------|--------------------------|
| 1. Throttle Lever | 5. Gasoline needle valve |
| 2. Adjusting screw (idling) | 6. Subpressure line |
| 3. Choke Lever | 7. Strainer lid |
| 4. Adjusting idling jet screw | 8. Air filter |

Magneto

The magneto is a typical flywheel magneto which generates electricity for ignition and lighting.

Figure 7 explains the lighting fixture as well as ignition switch diagram. In order to prevent lamp burn-outs, the total effect of lamps should be exactly 16W (6v). when alternating current is used for lighting purposes, switching should be made to one yellow wire only (see Fig. 7).

(The following is furnished for those interested in more magneto information. The Westerbeke Recommended Wiring Diagram #1523? is shown on Page 12.)

1. Magneto
2. 6 to 8 volt output (AC)
3. Connecting Block
4. Fuse*
5. Load Switch*
6. Lamp/resistance Load (to prevent burn-out of lamps, the total load must be 16 watts)
7. Magneto grounding switch
8. Engine Ground

* not furnished

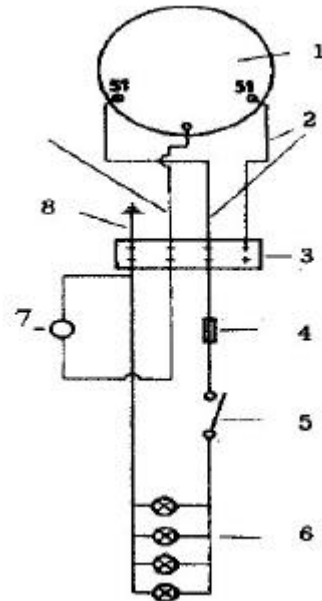


Figure 7 - Magneto

Starter Generator

A belt connects the engine crank shaft and the motor generator. When starting the motor generator acts as a starting engine taking the required power from a 12V battery, which is part of the electric system. When running the motor generator acts as a generator, generating electricity for the battery and other consumption points. Refer to Figure 5. Wiring diagram.

Reverse/Reduction Gear

The reverse/reduction gear is located directly behind The engine. The PTO shaft, which is at a level below the crank shaft, has bearings absorbing shaft loads created by the thrust of the propeller. Forward and reverse gear are engaged by means of a taper drive cone type clutch. There are no transfer gears in the construction. The gear wheel type water pump has been placed with the gear box.

MAINTENANCE

Maintenance Intervals

One of the surest ways to ensure reliable operation of the engine is to give it proper maintenance at the right time. Maintenance cost is low in comparison with the cost of repairs necessitated by negligence.

Beginning of the boating season:

- S Remove protective oil from the crankcase and the cylinder by rinsing with fuel.
- S Remove external protective grease (this is also necessary with new engine).
- S Clean the carburetor and the fuel pump.
- S Clean the spark plug and check the ignition gap.
- S Check the breaker point gap and oil the lubricating felt.
- S Fill the gear box with new oil to the level of the filler plug.
- S Fill the stern post greaser with grease
- S Check the condition and the tension of the generator belt pulley.
- S Check wiring connections.
- S Check the condition of the battery.
- S Check fluid level of battery (from time to time).
- S Check for leaks in the fuel and cooling systems (repair).
- S Check lubrication of stern post bearing.

At 50-hour intervals:

- S Clean the spark plug and check its gap.
- S Clean the carburetor strainer.
- S Change gear box oil (new engine).
- S Check fluid level of the battery.

At 100-hour intervals:

- S In addition to the above mentioned, change oil in gear box.

At 300-hour intervals:

- S In addition to the above mentioned, check breaker point gap.
- S Clean the carburetor.

Lubrication:

	Lubricants	Quantity
S Gear box (temperatures above 10 ⁰ C)	SAE 140	1.5 pints
S Gear box (temperatures below 10 ⁰ C)	SAE 90	1.5 pints

Reverse/Reduction Gear Lubrication:

Fill the box with oil so that the filler plug touches oil level when it is tightened and when the engine is in normal position. A mark on the filler plug shows the absolute maximum level. The oil quantity is 1-1/2 pints.

Checking the Spark Plug:

When cleaning the spark plug it is important to clean also the insulator part and the surrounding area. Avoid scratching the insulator surface as scratches will make it easier for pollutants to stick.

To adjust the gap, bend the ground electrode by tapping it lightly to required direction. The center electrode must not be bent. The gap is checked by using a 0.50 mm feeler gauge.

If the spark plug electrodes are worn, a new spark plug has to be installed. A spark plug in good condition should always be available in your boat.

Drying the Wet Magneto

If you have reason to believe that water has entered the magneto, remove the pulley wheel and spray moisture absorbant (CRC-56) through the opening in the flywheel.

If the engine still fails to start, remove the flywheel and the anchor plate and dry them thoroughly. The CRC5-56 (or similar) can also be used on other electric equipment of the engine.

Cleaning the Carburetor Strainer

Remove the strainer for cleaning by loosening and removing the bottom screw on the carburetor and take off the filter lid. The strainer lid should be removed with care so as not to damage the gasket between the strainer and the lid. The strainer is cleaned with gasoline and dried with compressed air. When re-assembling, check the gasket and install the strainer and the strainer lid carefully to get a tight fit and thus avoid air leakage.

Cleaning the Carburetor

When the engine has not been in use for a period of time, the oil in the fuel may de-oxidize and clog the carburetor. If this occurs, carefully remove the idling jet screw (4) and the main jet screw (5), placing a vessel under the carburetor so that the spring, the intermediate plate and the gasket do not get lost, and let the fuel flow through the screw holes for a while. If the fuel tank is located at a level lower than the carburetor, and there is no hand pump, install a temporary pipe through which fuel is led into the carburetor and allow the fuel to flow out the screw holes.

After this fasten the jet screws and adjust the carburetor. Should you have to open the carburetor completely, observe great cleanliness and care and note especially the diaphragms and their sealing surfaces should be treated with great caution. An air leakage in the sealing surface, valves or connections may render the carburetor useless. Internal channel should be cleaned with gasoline and compressed air. Steel tools, needles or similar should not be used.

Cleaning the Air Filter:

The air filter is of the so-called dry type. It is opened by removing the screws keeping the air filter in place. After that remove the cap and the filter. At the end of the boating season clean the filter with gasoline. Do likewise any time you have reason to believe that impurities in the air flow have entered the filter.

ADJUSTMENTS:

Adjusting the Carburetor

Idling

Clean and check the spark plug gap. Open the screw regulating idling fuel flow 1.5 times (4, Fig. 6). Run the engine warm. While keeping the engine under load adjust idling by adjustment screw (2) maintaining 1000-1100 RPM. At this RPM the engine runs 'four-cycle'. Remove load and check that RPM is not more than approximately 1300. If RPM is greater, adjust setting of adjustment screw (2) until 1300 RPM is achieved.

Full Power

With the gear engaged and full throttle, adjust fuel needle valve (5) until full output is achieved. This is usually achieved when the needle valve is opened 3/4 to 1 turn.

Adjusting The Magneto breaker Point Gap

Remove the pulley wheel and rotate the crank shaft till the breaker point gap is at its largest. Measure the gap with a feeler gauge: it should be 0.45 mm. The gap can be adjusted by loosening screw (1, Fig. 8) and turning point (2) from notch(A) with a screwdriver. Tighten screw (1).

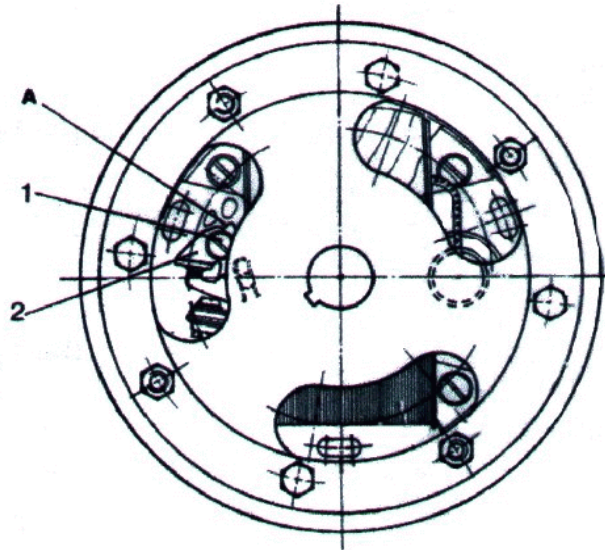


Figure 8 - Fly Wheel Magneto

Adjusting the Ignition Timing

Adjust the breaker point gap as described above. Ignition (opening of breaker point gap) should occur when the crank shaft is being rotated and the flywheel timing marker is at the level of the lower surface of the engine right side fastening point (see picture 1). If the breaker point gap does not open at this moment, loosen the anchor plate fastening screws slightly and turn the anchor plate in engine rotation direction or in opposite direction, depending on whether the opening occurs too early or too late.

When you have obtained the right setting for the anchor plate. i.e.. when the points open at the correct moment indicated by the timing marker, tighten the screws.

The opening moment can be observed by sight or by puffing a thin sheet of paper inserted between the points. while turning the crank shaft in the engine direction.

The timing marker setting (30°) is equal to the piston being 5.8 mm from its upper dead position. This can be measured from the spark plug hole.

ASSEMBLY INSTRUCTIONS

Dismantling the. Engine

Removal of the fly Wheel:

1. Remove the belt cover and The belt pulley.
2. Remove the pulley wheel.
3. Remove the flywheel fastening nut.
4. Fasten the extractor with pulley wheel screws to the flywheel. tighten the extractor center bolt against the end of the crankshaft.
5. Tap lightly with a hammer on the extractor center bolt head and the fly-wheel will come loose. Remove it.

Opening of Crankshaft Casing:

1. Remove oil from the gear box.
2. Remove the exhaust collector.
3. Remove the motor generator and tie belt pulley cover.
4. Remove the flywheel.
5. Unscrew the gear box fastening screws and remove the gear box by tapping lightly with a hammer. Removal should not be done by using a wedge between the sealing surfaces
6. Remove the cylinder.
7. Unscrew the bolts holding the crankshaft casing halves and remove these halves by tapping lightly.
8. Remove the crankshaft from the hall casing.

Assembling the Engine

Attention

If the crankshaft has been damaged. it must be sent to the factory or to a factory authorized workshop for repair.

When assembling the engine. note that all sealing surfaces should be meticulously clean. Moving parts and shaft sealers should be oiled lightly.

Assemble as follows

1. The bearings are fastened to the crankshaft by tapping with a socket on the inner frame of the bearing until it is in its proper place.
2. Shaft sealers are installed with care so that they do not become damaged in the process.
3. The crankshaft is placed in the back half of the crankcase. The sealing surfaces are brushed with glue and the forward half of the crankcase is put on the crankshaft so that no gradation appears on the cylinder fastening surface.
4. The fastening screws are fastened and tightened.
5. Turn the crankshaft to check if assembly has been correctly conducted so far.

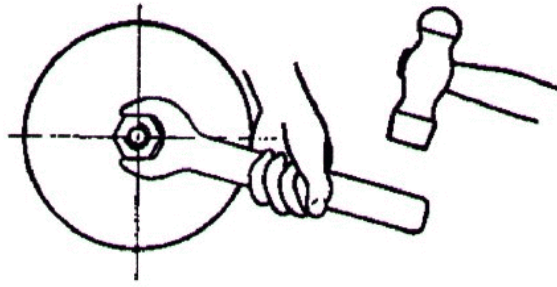


Figure 9. Tightening Flywheel

6. Install the piston and its pads (Note: Piston ring ends should be at the piston pin locking side of piston. This side of piston should be installed on the flywheel side).
7. Install the cylinder and its gasket.
8. Install the magneto anchor plate with its parts, the flywheel and the pulley wheel.
9. Install the gear box.
10. Install the motor generator, the belt pulley, the belt cover, the carburetor and the exhaust collector.

Fastening of Flywheel:

1. The flywheel is installed on the crankshaft so that the key goes into its key-way.
2. The nut is first tightened manually with a socket spanner or an adjustable spanner to the extent possible. The flywheel is kept in its place with one hand.
3. Tapping the spanner handle with a hammer forces the nut to tighten some more (see Fig. 9).

Should the pulley wheel fastening holes not coincide with the corresponding flywheel holes, the nut will have to be further tightened until the holes are in line.

Under no circumstances should the nut be loosened to line up with the bolt holes

Dismantling the Reverse/Reduction Gear Box

1. Remove oil from the gear box.
2. Remove the reverse/reduction gear box as described in “dismantling the engine”
3. Remove the water pump by unscrewing the housing screws and by removing the house gear wheel and the intermediate plate.
4. Remove the coupling flange by using an extractor.
5. Remove the shafts from the casing by pulling them out (forward). If the drive shaft does not slide out easily, it can be loosened by tapping lightly with a hammer on an end.
6. Remove the coupling rod from the coupling crank by removing the locking stud. When removing the coupling rod, be careful not to lose the coupling locking pin and the spring under it.
7. The coupling crank is removed from within the casing.

8. The reverse gear. intermediate gear wheel and its bearings become loose when the circlip is removed from the end of the shaft.
9. Shaft gaskets are removed only if they are to be replaced with new one
10. When removing the bearings pay attention to the fact that removing force should not be transferred through the bearing surfaces and roiling part unless you intend to discard the bearings after the removal.

Assembling the Reverse/Reduction Gear Box

1. Install shaft sealers making sure they face the correct direction.
2. Install the drive shaft bearing by pressing on the inner frame or tapping with a core.
3. Assemble the screw shaft (clutch cone, gear wheels, bearings and circlips).
4. Install the outer frames of the screw shaft bearings. (Note: possible use of shims) and inner frames on the shaft. taking into account the intermediate plates as well as the circlip at the engine end of the shaft.
5. Install the coupling crank and sealers. Note: do not lubricate sealers,
6. Install the drive shaft taking care not to damage the shaft sealers.
7. Install the water pump intermediate plate, the gear wheel. the key. the sealing ring and the pump house.
8. Install the screw shaft so that the coupling crank is in its correct place.
9. Install the hush key and the coupling flange on The screw shaft. Tighten the fastening nut of the coupling flange.
10. Install the coupling rod, the locking stud and the spring and hammer the cotter pin into its hole.
11. Fasten the reverse/reduction gear box to the engine.
12. Check the screw shaft end play, which should be approximately 0. 1 mm. If necessary. the play is adjusted by using shims.
13. Fill the gear box with the correct amount of oil.

STORAGE OF ENGINE

When the engine is stored for the winter or for some other reason it is not in use r a long period of time, the following is recommended:

- S** Remove the carburetor, the spark plug and the pulley belt.
- S** When the piston is in its uppermost dead position. pour 3 ounces engine oil through the suction slot into the crankcase.
- S** Turn the piston to the lowest position and tilt the engine so that the oil reaches the bearings.
- S** The piston is again turned into its uppermost position and 1.5 ounces oil is poured through the spark plug hole into the cylinder.
- S** Turn the crankshaft a few revolutions and leave the piston in the middle of a stroke position closing the cylinder slots.
- S** The spark plug is installed and the exposed parts that may rust are greased or oiled.
- S** Electric equipment may be sprayed for protection (for instance CRC5-56). After cleaning the battery and checking its fluid level, charge it.
- S** To protect the engine against dust it may be covered with PWC foil.

FAULT FINDING CHART

Engine Trouble

Probable Cause

- | | |
|---|--|
| 1. The engine does not start or stops while running | 1. Lack of fuel
2. Too much choke
3. Water in the carburetor
4. Carburetor main nozzle clogged
5. Carburetor strainer clogged
6. Gasoline tank vent hole clogged
7. Unsuitable fuel |
| 2. Running irregularly | 8. Air leak in the carburetor
9. Spark plug carbonized, sooted or burned out points
10. Electrode gap too big |
| 3. Engine output too Low | 11. Points moistened by water
12. Defective insulation
13. No contact between plug terminal and cable |
| 4. Engine knocking (Metallic sound when running) | 14. Contact breaker point gap short circuited or dirty
15. Contact breaker point gap too large or too small
16. Ignition cable, its magneto end loose or magneto internal wiring connections loose |
| 5. Fly wheel kicks back | 17. Wet magneto
18. Other defects in mage
19. Piston rings carbonized
20. Ignition advance too small
21. Carbon on piston or at cylinder bead
22. Ignition advance too big |

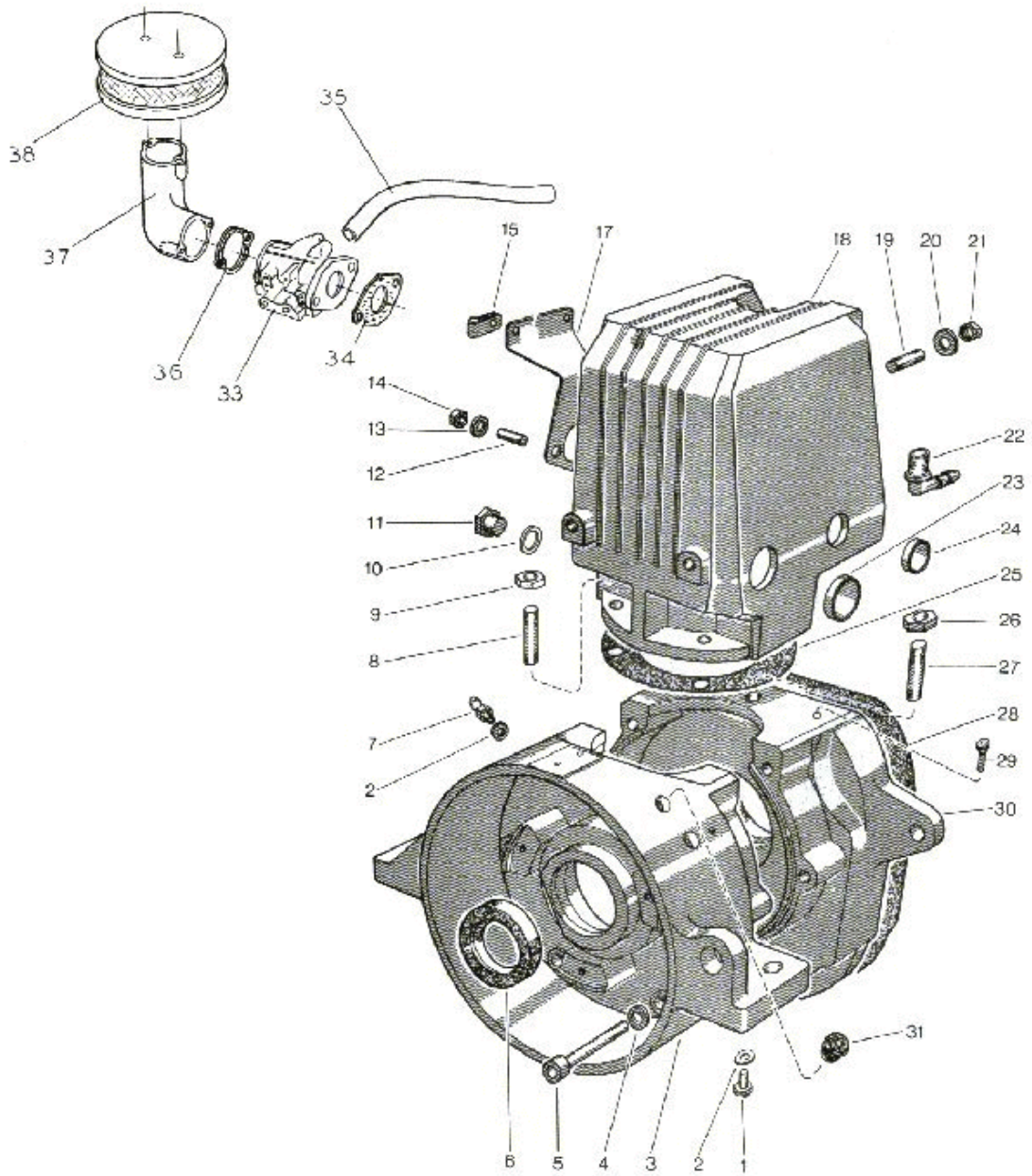
NOTES ON USING THIS PARTS LIST

- 1. Unit of issue for all linear commodities is inches (not feet or yards)**
- 2. Please – report errors and omissions to us via speed letter.
(Attention: Parker Chick)**

CONTENTS

VIRE 7:	CRANKCASE - CYLINDER - CARBURETOR
VIRE 7:	CRANKSHAFT - ROD - PISTON
VIRE 7:	FLYWHEEL - MAGNETO
VIRE 7:	WATER PUMP - MANIFOLD
VIRE 7:	TRANSMISSION - (EXTERNAL)
VIRE 7:	TRANSMISSION (INTERNAL)
VIRE 7:	ELECTRICAL SYSTEM
VIRE 7:	MISCELLANEOUS

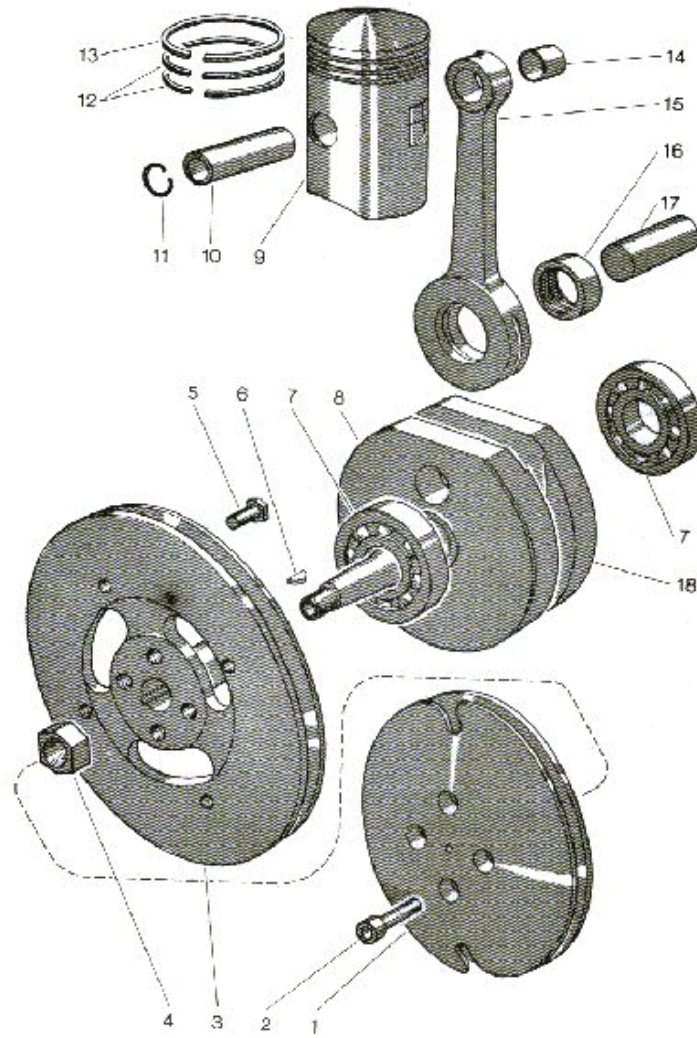
VIRE 7: CRANKCASE - CYLINDER - CARBURETOR



VIRE 7: CRANKCASE - CYLINDER - CARBURETOR

REF	PN	NAME	REMARKS	QTY
1	15816	PLUG	CRANKCASE DRAIN	1
2	18264	WASHER	CRANKCASE DRAIN PLUG	2
3	18199	BLOCK	FRONT HALF	1
4	15856	WASHER	SEALING	6
5	18255	SCREW	ALLEN HEAD	6
6	15851	SEAL	CRANKSHAFT	1
7	18273	ADAPTER	CRANKCASE BREATHER	1
8	15828	STUD	CYLINDER	2
9	15889	NUT	CYLINDER STUD	2
10	18263	WASHER	CYLINDER WATER DRAIN PLUG	1
11	18270	PLUG	CYLINDER WATER DRAIN	1
12	18249	STUD	CARBURETOR	2
13	15800	WASHER	CARBURETOR FLANGE	2
14	18241	NUT	CARBURETOR STUD	4
15	18198	CLIP	CABLE	2
17	18217	PLATE	CABLE SUPPORTING	1
18	18227	CYLINDER		1
19	18250	STUD	EXHAUST MANIFOLD	4
20	18239	WASHER	EXHAUST MANIFOLD STUD	4
21	18242	NUT	EXHAUST MANIFOLD STUD	4
22	18208	ELBOW	WATER	1
23	18269	COREPLUG		2
24	18268	COREPLUG		1
25	15882	GASKET	CYLINDER TO CRANKCASE	1
26	15887	NUT	CYLINDER STUD	1
27	15832	STUD	CYLINDER	1
28	18207	GASKET	BLOCK TO TRANSMISSION	1
29	18271	VENT	CRANKCASE	1
30	18200	BLOCK	REAR HALF	1
31	15890	GROMMET	CABLE	2
33-1	15953	CARBURETOR	COMPLETE	1
33-2	15980	GASKET SET	CARBURETOR	1
33-3	15968	REPAIR KIT	CARBURETOR	1
33-4	14909	PLATE METAL	- CARBURETOR BOTTOM	1
33-5	15000	LINE	FUEL INLET	1
33-6	20739	SHAFT	CARBURETOR	1
33-7	20740	SCREEN	CARBURETOR	1
33-8	20738	SCREW	CARBURETOR BODY	4
33-9	20737	VALVE BUTTERFLY	- CARBURETOR	1
33-12	20736	LEVER	CARBURETOR THROTTLE	1
34	18237	GASKET	CARBURETOR TO CYLINDER	1
35	18211	HOSE	CARBURETOR TO CRANKCASE - BREATHER	1
36	13477	GASKET	ELBOW TO CARBURETOR	1
37	13454	ELBOW	FLAME ARRESTOR TO CARBURETOR	1
38	16712	ARRESTOR	FLAME	1

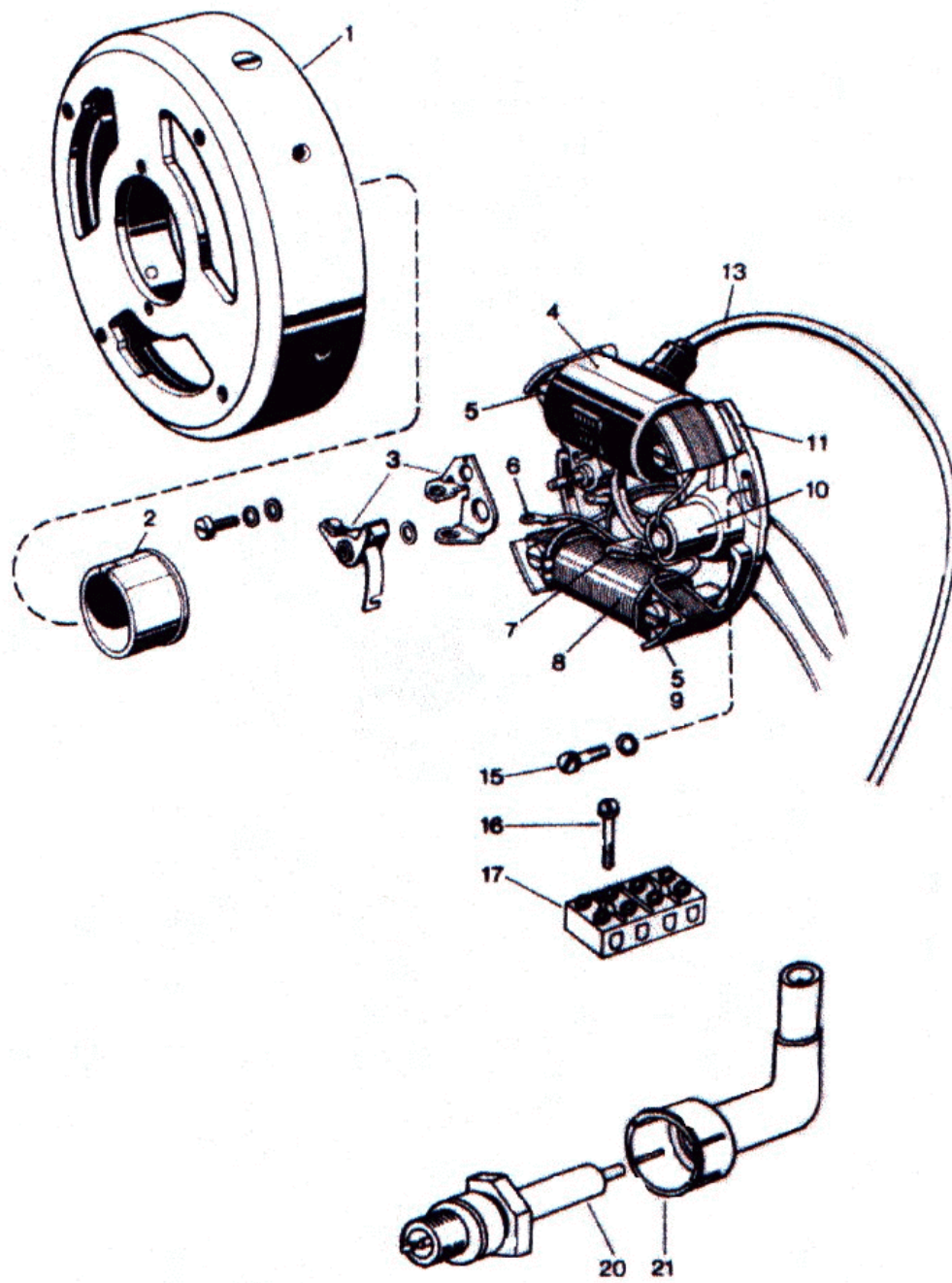
VIRE 7: CRANKSHAFT - ROD - PISTON



VIRE 7: CRANKCASE - ROD - PISTON

REF	PN	NAME	REMARKS	QTY
1	18205	PULLEY	ROPE STARTING	1
2	18254	SCREW	PULLEY TO CRANKSHAFT	4
3-1	18206	PULLEY	ELECTRIC STARTING	1
3-2	18197	PULLER	PULLEY FROM CRANKSHAFT	1
4	15814	NUT	PULLEY TO CRANKSHAFT	1
5	18246	SCREW		4
6	15891	KEY	ELECTRIC STARTING PULLEY	1
7	18260	BEARING	FRONT HALF	2
8	18202	CRANKSHAFT	FRONT HALF	1
9-1	18195	PISTON	STANDARD - INCL RINGS & PIN	1
9-2	15972	PISTON	0.5 OVERSIZE - INCL RINGS & PIN	1
10	15883	PIN	PISTON	1
11	15861	CIRCLIP	PISTON PIN	2
12-1	15885	RING	PISTON - STD	2
12-2	15974	RING	PISTON - STD	2
13-1	15973	RING	PISTON - STD - CHROME PLATED	1
13-2	15975	RING	PISTON - 0.5 OS - CHROME PLATED	1
14	15880	BUSHING	PISTON PIN	1
15	18196	ROD	CONNECTING	1
16	15848	BEARING	CONNECTING ROD	1
17	18261	PIN	CONNECTING ROD	1
18	18203	CRANKSHAFT	REAR HALF	1

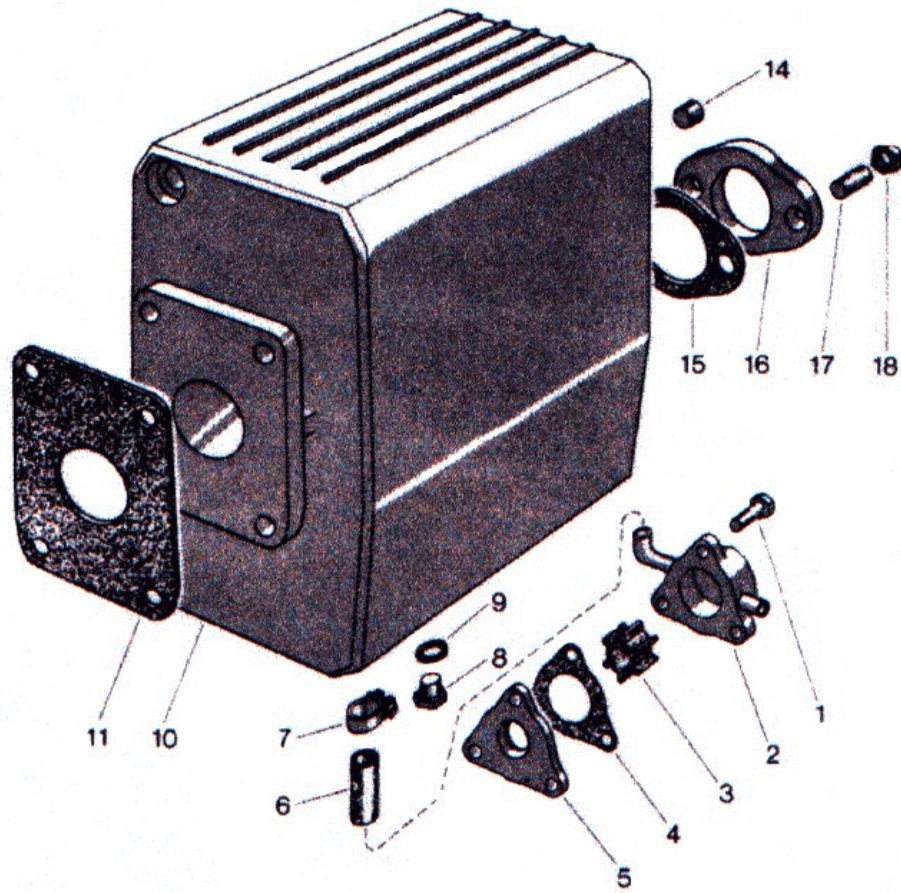
VIRE 7: FLYWHEEL - MAGNETO



VIRE 7: FLYWHEEL - MAGNETO

REF	PN	NAME	REMARKS	QUAN
1	15963	FLYWHEEL	HOUSES MAGNETO	1
2	15961	CAM	IGNITION POINTS	1
3	15958	POINTS	IGNITION	1
4	15959	COIL	IGNITION	1
5	15970	SCREW		4
7	15967	FELT		1
8	15962	COIL	AUXILIARY	1
9	18238	SPRING		4
10	15957	CONDENSER		1
11	15965	ARMATURE		1
13	18274	CABLE	IGNITION	1
15	18253	SCREW		3
16	18252	SCREW		2
17	18209	BLOCK	TERMINAL	1
20	15945	SPARKPLUG		1
21	15971	CONNECTOR	SPARKPLUG	1

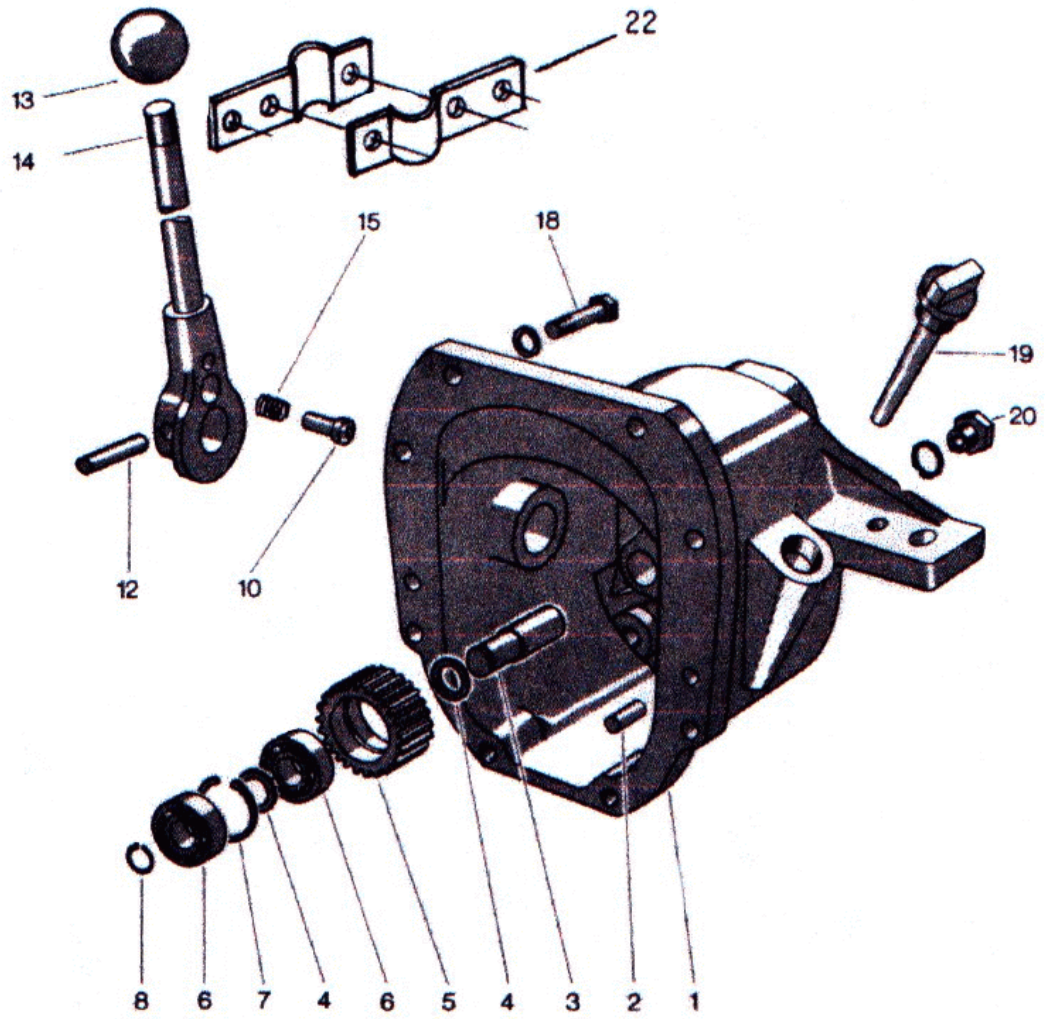
WATER PUMP - MANIFOLD



VIRE 7: WATER PUMP - MANIFOLD

REF	PN	NAME	REMARKS	QUAN
1	18248	SCREW	WATER PUMP HOUSING	3
2	18216	HOUSING	WATER PUMP	1
3	18212	IMPELLER	WATER PUMP	1
4	18223	GASKET	WATER PUMP IMPELLER	1
5	18215	PLATE	WATER PUMP BODY TO TRANSMISSION	1
6	18210	HOSE	WATER PUMP TO CYLINDER	1
7	17298	CLAMP		1
8	18270	PLUG	MANIFOLD DRAIN	1
9	18263	WASHER	MANIFOLD DRAIN PLUG	1
10	18218	MANIFOLD	EXHAUST - EXPANSION CYLINDER	1
11	18221	GASKET	EXHAUST MANIFOLD TO CYLINDER	1
14	18275	COREPLUG		1
15	18272	GASKET	EXHAUST FLANGE TO MANIFOLD	1
16	15916	FLANGE	EXHAUST	1
17	18251	STUD	EXHAUST FLANGE	2
18	18242	NUT	EXHAUST MANIFOLD STUD	2
19	15276	ELBOW	WATER INJECTED - EXHAUST	1

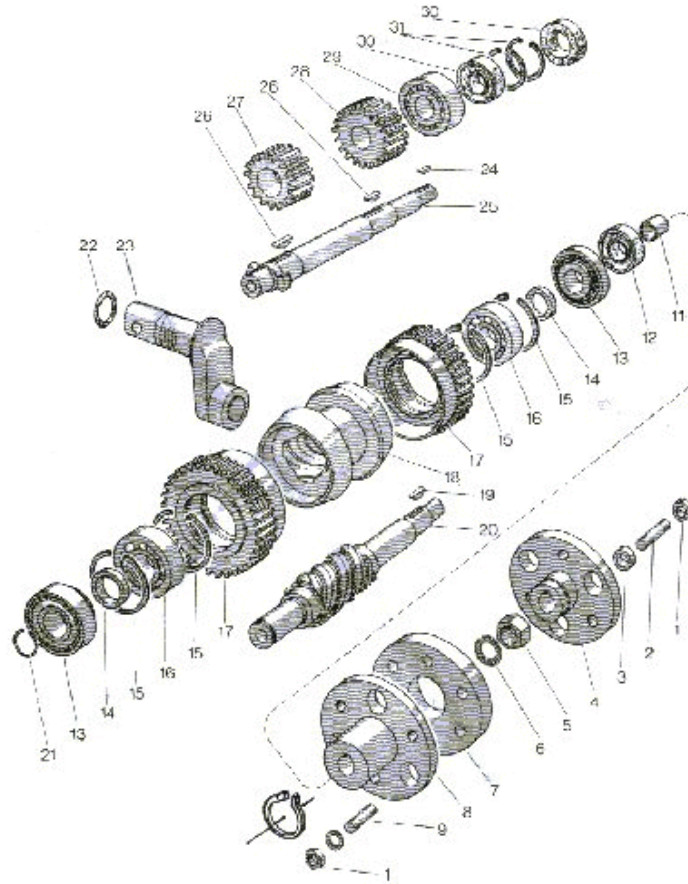
VIRE 7: TRANSMISSION (EXTERNAL)



VIRE 7: TRANSMISSION (EXTERNAL)

REF	PN	NAME	REMARKS	QUAN
1	18213	HOUSING	TRANSMISSION	1
2	15840	PIN	DOWEL	2
3	15899	SHAFT		1
4	15900	WASHER		2
5	15901	GEAR		1
6	15845	BEARING		2
7	15862	SNAPRING		1
8	15859	SNAPRING		1
10	18230	SCREW		1
12	18256	PIN	SHIFT LEVER	1
13	18225	KNOB	SHIFT LEVER	1
14	18229	LEVER	SHIFT	1
15	15871	SPRING		1
18	15821	SCREW	TRANSMISSION TO CRANKCASE	1
19	18214	DIPSTICK	TRANSMISSION OIL	1
20	15944	DRAINPLUG	MAGNETIC - WITH GASKET	1
22	18228	CLAMP	SHIFT LEVER	2

VIRE 71 TRANSMISSION (INTERNAL)



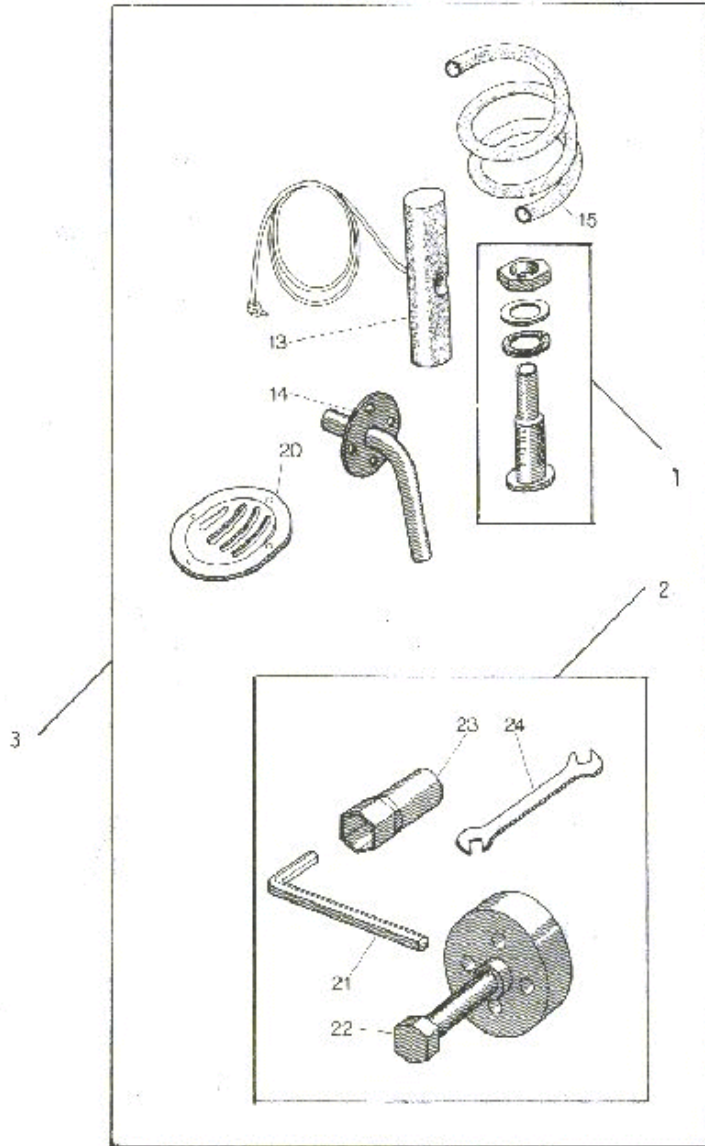
VIRE 7: TRANSMISSION (INTERNAL)

REF	PN	NAME	REMARKS	QUAN
1	18245	NUT	COUPLING STUD	6
2	15831	STUD		3
3	15911	WASHER		3
4	15910	COUPLING	ENGINE HALF	1
5	18244	NUT		1
6	18240	WASHER		1
7	15908	DAMPER		1
8	15909	COUPLING	PROPELLER SHAFT HALF	1
9	15830	STUD	COUPLING	3
11	15933	BUSHING		1
12	15850	SEAL		1
13	15847	BEARING		2
14	18220	THRUSTWASHER		2
15	18267	SNAPRING		4
16	18259	BEARING		2
17	18219	GEAR		2
18	18201	CONE		1
19	15912	KEY		1
20	18204	SHAFT		1
21	18265	SNAPRING		1
22	15854	O RING		1
23	18224	CRANK		1
24	18257	KEY		1
25	18222	SHAFT		1
26	18258	KEY		2
27	15874	GEAR		1
28	15875	GEAR		1
29	15843	BEARING		1
30	18262	SEAL		2
31	18266	SNAPRING		2
32	15253	RING	SHAFT LOCKING	1

VIRE 7: ELECTRICAL SYSTEM

REF	PN	NAME	REMARKS
1	15841	PANEL	
2-1	15176	GENERATOR	COMBINATION STARTER/ GENERATOR
2-2	11185	STRAP	STRAP
2-3	15155	PULLEY	STARTER
2-4	15229	SPACER	STARTER POSITIONING
2-5	15228	BELT	TO SEPT. 74
2-6	18226	GUARD	TO STARTER BELT
2-7	18247	SCREW	GUARD
2-8	19265	STRAP	GENERATOR - 13585 BELT
2-9	13585	BELT	FROM SEPT. 24
3	11489	SOLENOID	STARTER
4	16458	REGULATOR	
5	11956	KEYSWITCH	
6	11429	SOCKET	WITH RED LENSE
7	11482	LAMP	
8	15240	SWITCH	MAGNETO

VIRE 7: MISCELLANEOUS



VIRE 7: MISCELLANEOUS

REF	PN	NAME	REMARKS
1	20955	THRUHULL	ASSEMBLY
2	20954	TOOLKIT	
3	20956	KIT	INSTALLATION
13	20923	ROPE	STARTING
14	20924	ELBOW	FLANGED - SEA WATER DISCHARGE
15	20717	LINE	SEA WATER PIPING
20	20925	STRAINER	SEA WATER
21	20715	WRENCH	8 MM. ALLAN - FRONT PULLEY
22	18197	PULLER	FLYWHEEL
23	20915	WRENCH	SPARKPLUG
24	20925	WRENCH	12X14MM OPEN END