

# INSTRUCTION BOOK

ALBIN Marine Engines

O-11, O-21, O-41 and O-411



Before you run your new engine, we recommend you to study this instruction book carefully. It contains all the necessary advice you will need for running and maintaining the engine correctly. If you note the advice and instructions given, we are confident that the performance and running capacity will be all that you may expect of a quality product.

**ALBIN**

## ALBIN O-11

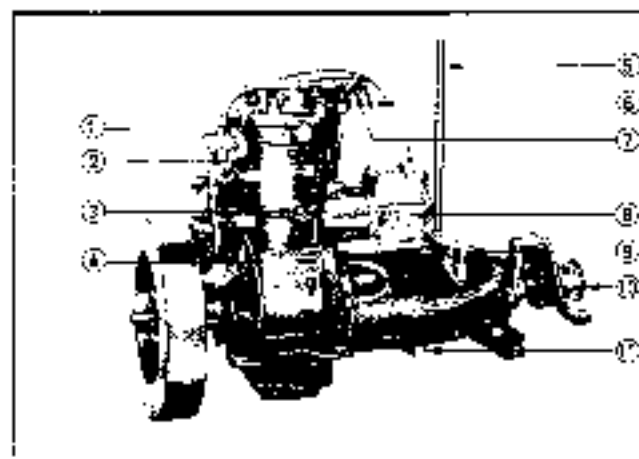


FIG. 1

- 1 Connection for cooling water thermometer
- 2 Temperature control
- 3 Drain cock for circulation water jacket
- 4 Oil dipstick for crankcase
- 5 Reverse gear lever
- 6 Drainage cock for cooling water
- 7 Cooling water discharge
- 8 Igniter
- 9 Oil dipstick for reverse gear
- 10 Propeller shaft coupling
- 11 Oil drain plug for reverse gear
- 12 Inlet to engine room thermostat cooling

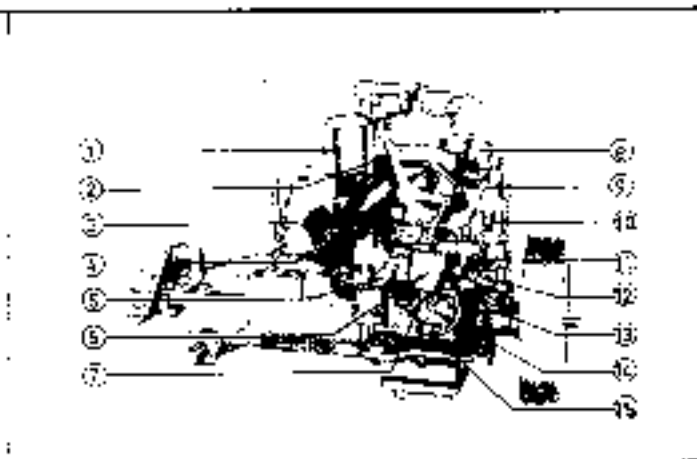


FIG. 2

- 1 Oil filler pipe
- 2 Throttle lever
- 3 Filling adjustment screw
- 4 Exhaust manifold
- 5 Globe lever
- 6 Carburetor
- 7 Drain screw for float chamber
- 8 Mixture control screw
- 9 Connection for oil pressure gauge
- 10 Grommet for cooling water pump
- 11 Connection for fuel pipe
- 12 Cooling water pump suction intake
- 13 Drain cock for cooling water pump
- 14 Oil pump
- 15 Relief valve for oil pump

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## ALBIN O-21

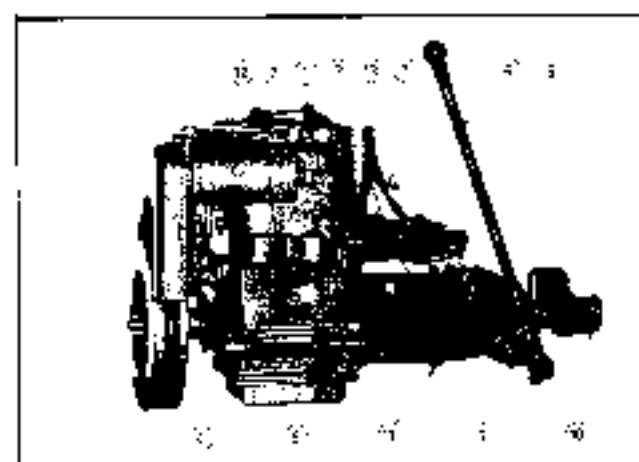


FIG. 3

- 1 Connection for cooling water thermometer
- 2 Thermostat
- 3 Drain cock for circulation water jacket
- 4 Crankcase inspection cover
- 5 Oil dipstick for crankcase
- 6 Reverse gear lever
- 7 Cooling water discharge
- 8 Distributor
- 9 Oil dipstick for reverse gear
- 10 Propeller shaft coupling
- 11 Oil drain plug for reverse gear
- 12 Igniters
- 13 Ignition coil

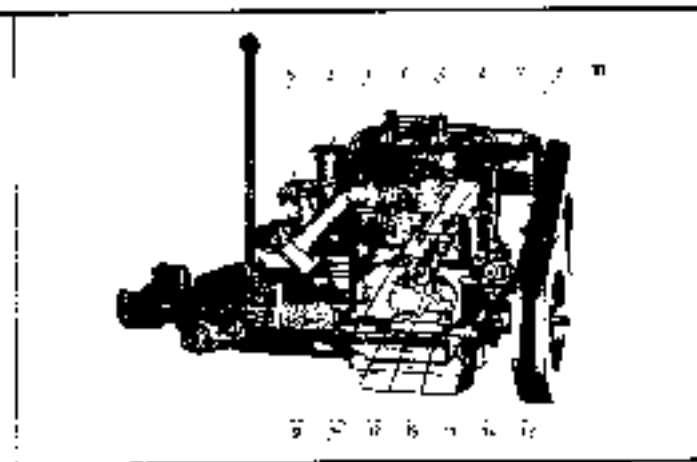


FIG. 4

- 1 Oil filler pipe
- 2 Throttle lever
- 3 Drainage cock for cooling water
- 4 Filling adjustment screw
- 5 Exhaust pipe connection
- 6 Globe lever
- 7 Carburetor
- 8 Drain screw for float chamber
- 9 Mixture control screw
- 10 Connection for fuel pipe
- 11 Grommet for cooling water pump
- 12 Connection for oil pressure gauge
- 13 Cooling water pump suction intake
- 14 Drain cock for cooling water pump
- 15 Relief valve for oil pump
- 16 Oil pump

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# ALBIN O-41

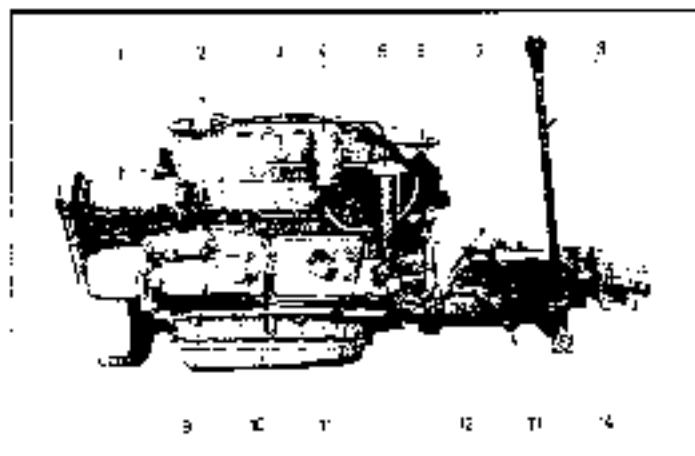


Fig. 7

- 1 Generator
- 2 Throttle star
- 3 Connection for cooling water discharge
- 4 Ignition coil
- 5 Oil filler pipe
- 6 Cooling water discharge
- 7 Oil filler cap for reverse gear
- 8 Reverse gear lever
- 9 Starter
- 10 Oil dipstick for reverse gear
- 11 Drain cock for crankcase water jacket
- 12 Exhaust pipe
- 13 Oil drain plug for reverse gear
- 14 Propeller shaft coupling

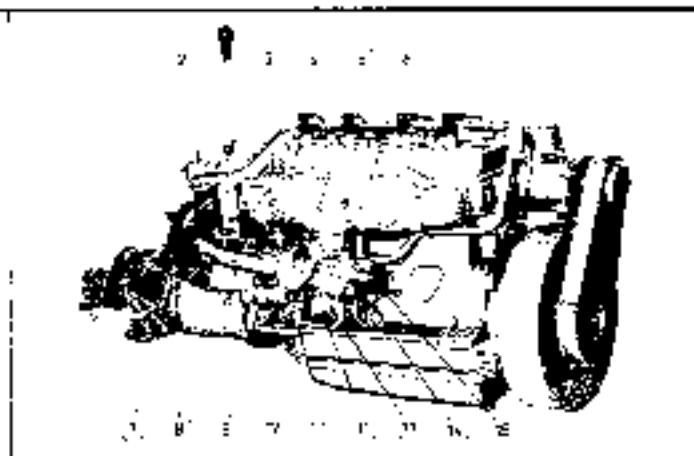


Fig. 8

- 1 Three way cock for cooling water
- 2 Throttle lever
- 3 Drain cock for exhaust manifold water jacket
- 4 Oil filler adjustment screw
- 5 Mixture control screw
- 6 Oil dipstick for reverse gear
- 7 Exhaust pipe adjustment
- 8 Cooling water pump suction intake
- 9 Drain cock for cooling water pump
- 10 Oil pump
- 11 Gudgeon
- 12 Gudgeon screw
- 13 Drain cock for float chamber
- 14 Connection for oil pressure gauge
- 15 Connection for fuel pipe

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# ALBIN O-411

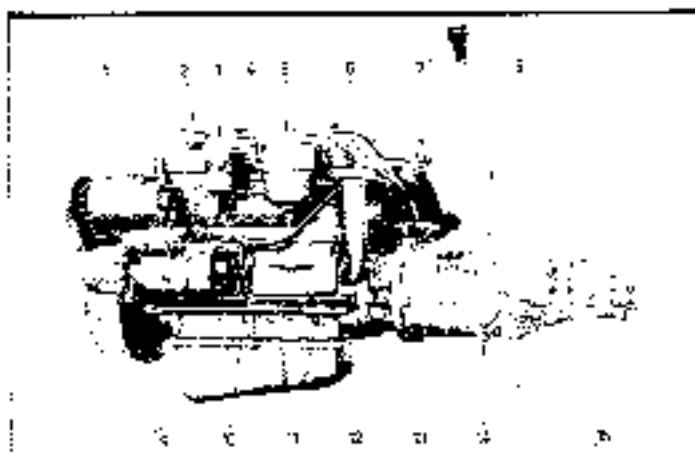


Fig. 9

- 1 Generator
- 2 Throttle star
- 3 Ignition coil
- 4 Connection for cooling water discharge
- 5 Fuel valve and filter
- 6 Oil filler pipe
- 7 Cooling water discharge
- 8 Reverse gear lever
- 9 Starter
- 10 Oil dipstick for crankcase
- 11 Drain cock for crankcase water jacket
- 12 Exhaust pipe
- 13 Oil filler cap for reverse gear
- 14 Oil drain plug for reverse gear
- 15 Propeller shaft coupling

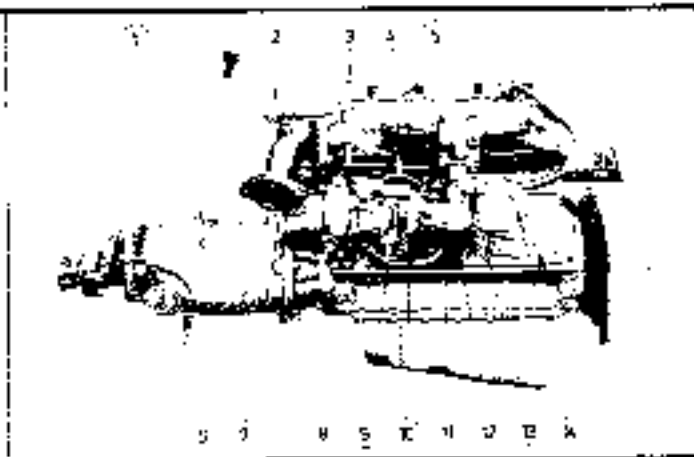


Fig. 10

- 1 Oil dipstick for reverse gear
- 2 Three way cock for cooling water
- 3 Throttle lever
- 4 Drain cock for exhaust manifold water jacket
- 5 Throttle lever
- 6 Exhaust pipe adjustment
- 7 Reverse gear for disengage the gear coming up
- 8 Cooling water pump suction intake
- 9 Drain cock for cooling water pump
- 10 Oil pump
- 11 Drain adjustment screw
- 12 Connection for oil pressure gauge
- 13 Mixture control screw

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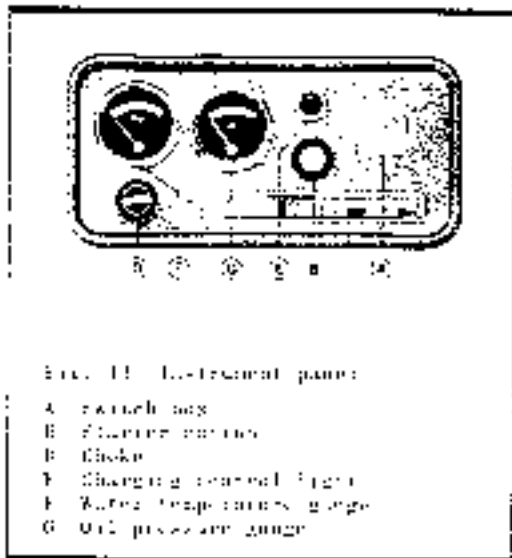


FIG. 11 Instrument panel

- A Tachometer
- B Fuel gauge
- C Choke
- F Charging control light
- E Water temperature gauge
- G Oil pressure gauge

## STARTING AND RUNNING

### Inspection

When a new engine leaves the factory, it has already been partially tested and has been carefully checked and lubricated up to the specified output. It is recommended that the engine be run at only half the rated RPM for the first 25 hours in order to complete the running-in process. After that, the load may be progressively increased, but careful maintenance is of vital importance for the length of life and reliable performance of the engine.

### Before starting

1. Open the engine cover so that the engine compartment is properly ventilated. Pump out the ridge water carefully and check at the same time that no fuel leakage has occurred.
2. Use the oil dipstick on the port side of the engine to check the lubricating oil level in the crankcase. When necessary, fill up with lubricating oil to the upper level mark on the dipstick. For lubricating oil having quality Service M9 or the viscosity SAE 30 during summer and SAE 20 during winter.
3. Check the lubricating oil level in the needle gear. Use the special oil dipstick intended for this purpose. When necessary, fill up to the level mark. Use oil of the same make and quality as in the engine.
4. Lubricate the cooling water pump by turning the grease nipple from the front. NOTE: Avoid over lubrication as there is a risk that grease may penetrate into the cooling system. Use multi-purpose water pump grease.
5. Operate the propeller shaft bearings. Use multi-purpose water pump grease.
6. Check that the cooling water drain cocks on the engine block and the cooling water pump are closed. Open the sea-cock for the cooling water intake.
7. Check that the three-way cock for the cooling water intake is

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adjusted for discharge overboard.

NOTE: When a heat resistant rubber exhaust hose is used all the cooling water must be fed through the exhaust system at all times. The rubber exhaust hose will otherwise become damaged due to overheating.

8. Check the fuel level in the tank and open the fuel cock. If the engine is a petrol/paraffin model, the three-way cock should be switched over to petrol (gasoline). At the same time, check pipes and fittings for fuel leakage.

### Starting

1. Set the reverse gear lever to neutral.
2. On engines with electrical equipment insert the ignition key.
3. Set the throttle control to one-third open.
4. Close the choke and crank the engine round a few times. Then open the choke (in cold weather).
5. Start the engine by cranking or, if it has electrical equipment, by pressing the starter button.

If the engine has received too rich a mixture due to excessive choking, it will be necessary to set the throttle to "full" before the engine will start.

The starting procedure varies with individual engines, so that it may be necessary to modify the above instructions accordingly.

### After starting

1. Set the magneto ignition control to "advance". (Only for engines with magneto ignition.)
2. Check the cooling water circulation.

3. Set the three-way cock on the exhaust manifold to the middle position.

NOTE: When a heat resistant rubber exhaust hose is used all the cooling water must be fed through the exhaust system at all times. The rubber exhaust hose will otherwise become damaged due to overheating.

4. Check the oil pressure.

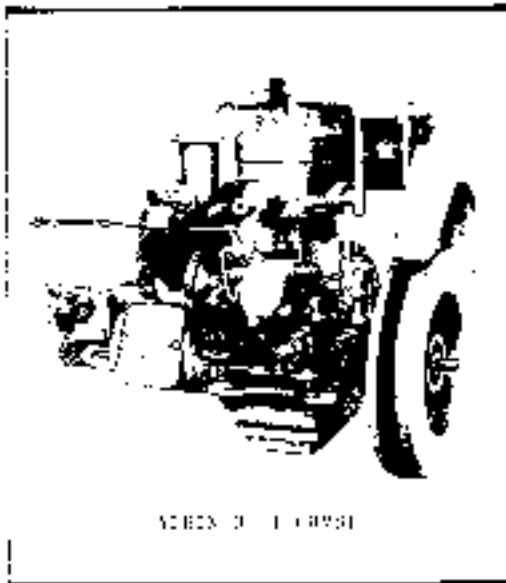
### Manoeuvring

Move the gearbox lever forward for running ahead and aft for running astern. When manoeuvring, the engine should be running slowly. Sharp jocking of the levers will cause unnecessary strain on the engine and reverse gear. Excessively slow movement of the lever can cause the clutch to slip. When shifting the lever from ahead or astern to neutral, adjust the throttle to avoid racing the engine.

### Running

When running, check the engine oil pressure and cooling water temperature at regular intervals. If the engine has electrical equipment also note whether the battery is charging. The charging control light glows when the ignition is switched on and at low revolutions but is extinguished at high revolutions, which indicates that the dynamo is charging. In the case of petrol/paraffin models the three-way fuel cock should not be switched over to paraffin (kerosene) until the engine has reached full operating temperature, i.e. about 60° C (160° F) - the temperature indicator within the green area of the cooling water thermometer. In order to obtain good combustion when running on paraffin (kerosene), the engine should not be run below half load, i.e. below half throttle, except for short periods. Before stopping the engine, switch over to petrol (gasoline) in good time in order to facilitate restarting. If the engine should stop unexpectedly while

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21.113 0 1, COMB2

running or paraffin kerosene), drain the carburetor through the drain cock provided before moving the drive-way fuel cock over to petrol (gasoline).

Experience has shown that the better setting of paraffin (kerosene) available on the market is better than others. This may result in knocking when running on one particular brand of paraffin (kerosene), although the engine may run perfectly well on other brands. In most cases, the knocking can be eliminated by mixing a 50% of petrol (gasoline) with the paraffin (kerosene).

#### Stopping

1. Shut the drive-way cock to petrol (gasoline), fully in the case of paraffin (kerosene) running.
2. Give the drive-way cock for the cooling water an inch to discharge the thermal lubricant, 2 minute before stopping the engine. **NOTE:** When a heat exchanger rubber exhaust hose is used all the cooling water must be led through the exhaust system at all times. The rubber exhaust hose will wear away and cause damage due to overheating.
3. Switch off the generator.
4. Close the fuel cock.

#### SPECIAL ADVICE AND INSTRUCTIONS FOR 0-1, COMB2 AND 0 2, COMB2

#### Starting

When starting the engine the remote control lever should be in neutral position. In warm weather 10 to 15 minutes may be required.

If the engine is used in early spring or late autumn it may be necessary to use the choke. The remote control lever should be in neutral position. When the choke control is pulled out, the throttle butterfly will automatically open resulting in an increased idling speed. As soon as the engine is warm, push in the choke control.

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#### Running

Give the remote control lever forward for running ahead and aft for running astern. When the control lever is moved forward the propeller pitch as well as the speed of the engine is increased in normal proportions. The same happens when the control lever is moved aft from the neutral position.

To achieve less propeller drag from the propeller when sailing, it can be feathered by moving the control lever as far aft as possible.

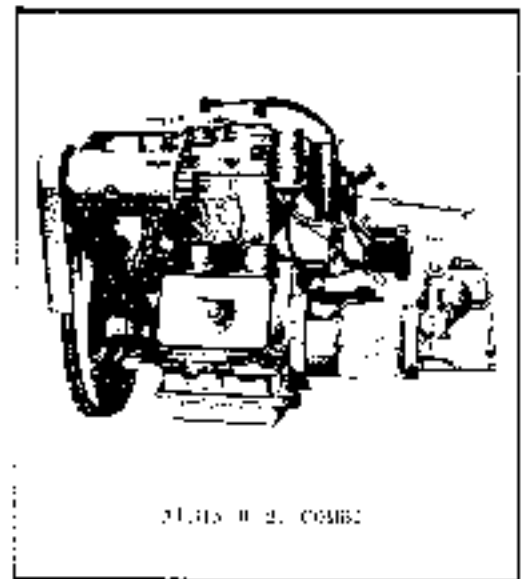
When running ahead the engine speed can be too low if the control lever has been moved too far ahead. This can happen, for example, if the engine is installed in a particularly big boat. However, the control lever should be set in a position giving the engine a speed of about 1450 rpm.

#### Lubrication (COMB2)

It is particularly important that the running mechanism is lubricated at least once every season. When lubricating proceed as follows: Set the remote control lever in neutral position. Pump oil grease through the pressure lubricating nipple in the manufacturing mechanism - at least 20 pump strokes. The pressure lubricating nipple is located on the port side.

Lubricate with a suitable grease for the application - see reversed Shell Alvania EP 2 or Essol Eponon 2.

The cam cover of the manufacturing mechanism should also be lubricated with the same type of grease. The ball joint and also the fork and connection for the velocity device should be lubricated with ordinary oil (S.O.I.).



21.113 0 2, COMB2

## MAINTENANCE SCHEME

	Daily	Every 50 hours {	Every 250 hours {
1 Check the oil level in the engine, reverse gear and reduction gear .....	x		
2 Turn the grease cap for the cooling water pump about one turn ...	x 2)		
3 Change the engine oil .....		x	
4 Clean the oil filler cap breather (only 0-11) .....			x
5 Change the oil in the reverse gear and reduction gear .....			x
6 Check the spark plugs .....			x
7 Clean the fuel filter and carburettor .....			x
8 Check the contact breaker points .....			x
9 Check the dynamo start V-belt tension .....		x	
10 Check the acid level of the battery .....	x		
11 Check the charging condition of the battery .....		x	
12 General inspection and overhaul of the engine, reverse gear and electric equipment .....			3)

1) Alternatively once every season if this time interval is reached first.

2) Every 12 hours.

3) Whenever necessary or, for example, every other year.

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### LUBRICATING SYSTEM

The lower part of the crankcase acts as an oil reservoir. The oil quantity for the different engine types is: 0-11 0,5 litres (1,06 Imp. pints/1,05 US pints), 0-21 1,4 litres (2,94 Imp.pints/2,95 US pints), 0-41 3,0 litres (6,3 Imp. pints/6,97 US pints), and 0-411 5,0 litres (10,6 Imp. pints/10,56 US pints). The engine is filled with oil through the filler pipe and the level checked with the dipstick. Use engine oil with the quality Service 40. During summer the viscosity should be SAE 30 and during winter SAE 20.

A gear pump circulates the lubricating oil. The oil pressure is set at the factory and indicated on a gauge. Normal pressure is in the green section of the gauge. When the engine is warm and run at normal speed, the oil pressure should be 1,5 - 2,5 kg/cm<sup>2</sup> (20 - 35 p.s.i.). A discrepancy in the pressure may be a sign of a defect in the lubrication system, which must then be examined thoroughly.

With a new engine, the oil should be changed after the first 25 hours running and thereafter every 50 hours. The old oil is drained through the drain plug on the crankcase. If this is not accessible, the oil is removed by sucking it out through the dipstick hole with a special suction pump included in the tool kit. Always change the oil after laying up (e.g. winter lay-up), regardless of how little the oil has been used.

The engine type 0-11 has a breather on the oil filler cap (fig. 12). Check that the breather ball A does not stick but works satisfactorily. The ball valve should be washed in petrol (gasoline).

The engine 0-411 is provided with a "Fross" lubricating oil filter. The filter element should be changed every 150 hours - cleaning the old element is not recommended. The element can be replaced by simply removing the cover of the filter body. Clean the body and fit new seals which are supplied with the element when replacing the unit. After reassembling run the engine until warm and check that there is no leakage - especially from the seal between the filter body and its cover.

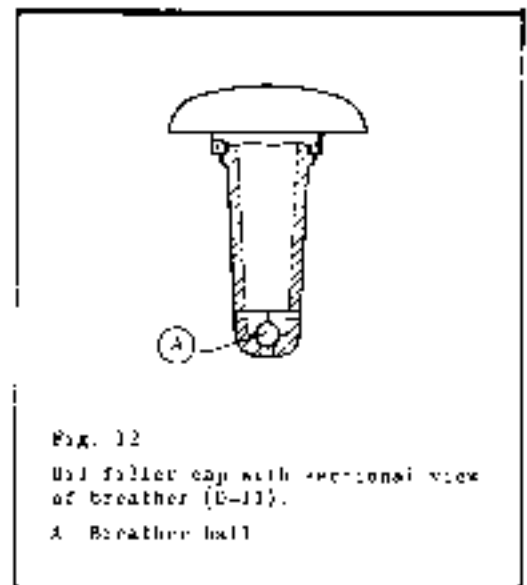
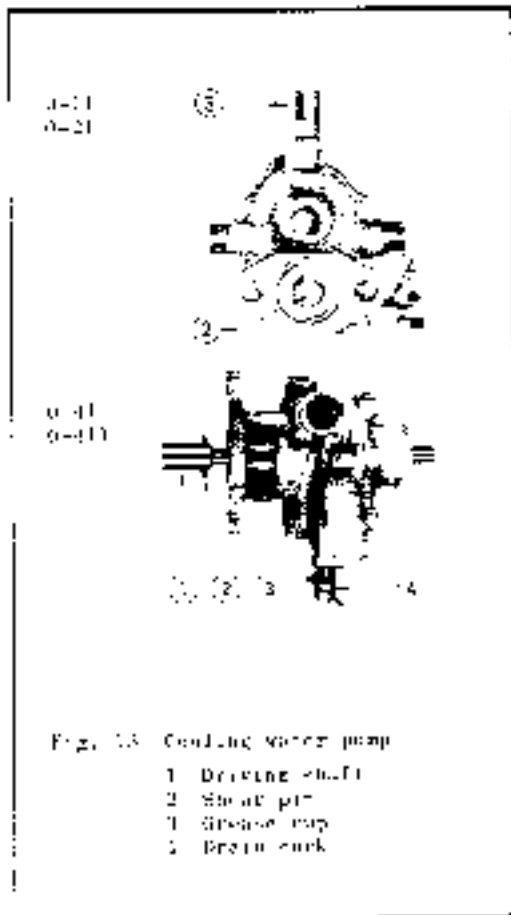


Fig. 12

Oil filler cap with sectional view of breather (0-11).

A Breather ball



#### COOLING SYSTEM

The cooling water is circulated in the engine water passages by means of a gear pump. The pump drive from the camshaft is transmitted through a shear pin, which is made of special material as a safety measure. If the pump has frozen during cold weather or seized for some other reason, the shear pin will break when the engine starts, thus preventing damage to the pump. A spare shear pin should be held in reserve and can be fitted by removing the cooling water pump.

The cooling water pump should be lubricated every 20 hours during running by turning the grease cup filled on the pump about one turn. Use water resistant grease. Make sure that the lubricating cup is filled with grease and lubricate by gradually screwing down the cap. Over-greasing should be avoided as the excess grease will enter the pump and be passed, together with water, into the cooling water jackets where it will be deposited on the walls, thus impairing the circulation.

Before starting set the cooling water throwway cock to direct discharge so that all the water passes out through the pipe overboard. Also make it easy to check that the circulation is satisfactory. After this, set the cock to its middle position. The water will then be discharged partly through the overboard pipe and partly through the exhaust pipe. The water passing through the exhaust cools this pipe and heats the exhaust gases. About  $\frac{1}{2}$  minute prior to starting, set the throwway cock to discharge overboard again so that the exhaust gases will blow the pipe free from water and from soot.

**NOTE** When a heat resistant rubber exhaust hose is used all the cooling water must be led through the exhaust system at all times. The rubber exhaust hose will otherwise become damaged due to overheating.

The cooling water discharge should be located about one foot above the waterline.

The working temperature is of great importance to the length of life, fuel economy, smooth running and general functioning of the

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engine. Therefore the engines are provided with a thermostat which automatically keeps the engine temperature correct independent of load and temperature of the surrounding water.

The thermostat, which is placed at the cylinder head, is of the bellows type. Should the bellows fail, as up to now, generally the thermostat will remain open and the engine temperature will be correspondingly lower. As an emergency measure the thermostat housing can be removed and the thermostat can easily be changed.

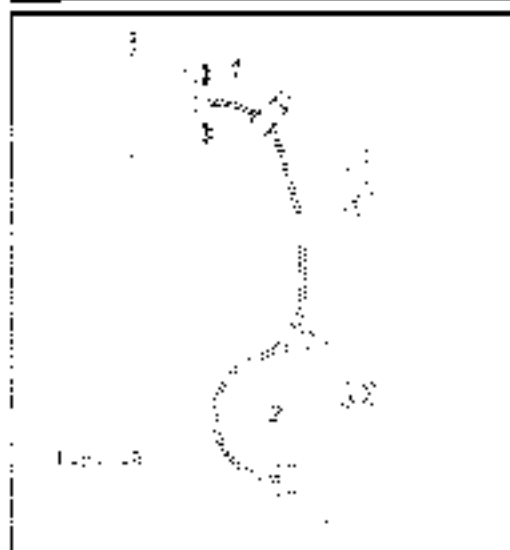
Engines with hand start have a thermostat which is fixed to the cylinder head, but this type of thermostat has the cooling water temperature set low so that the water cools.

Engines with electric starting have the cooling water temperature gauge fitted to the instrument panel. With this type of instrument the temperature shall be within the green section.

When fitting the cooling water temperature gauge take care that the capillary tube is adequately supported. One tube should be supported close to the instrument, as shown in Fig. 14 position 1. The clip should not be screwed directly over the tube, but a rubber pad or shield be placed between clip and tube. Leads in the capillary tube should not have a diameter less than  $0.015$  in ( $0.4$  mm). In order to prevent vibration there should be an additional support for the tube between the instrument and the engine, as shown in Fig. 15. This should be placed near the instrument. The clip should be at such distance from the instrument and engine that it may be screwed to a cylinder head boss.

#### CARBURETTOR

The engine is fitted with a safety upright carburettor of the float jet design. The carburettor has a choke mounted with an air breaker. This is used for starting, allowing and clearing starting. The mouth of the venturi tube being fitted with a double flange float trap.



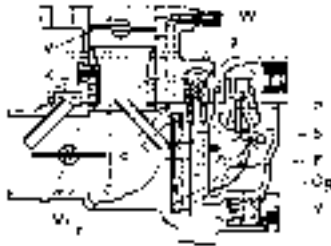


Fig. 16 Section through Solex carburetor.

- A Correction jet
- F Float
- G Main jet
- g Pilot jet
- z Choke tube
- P Needle valve
- e Excess fuel suction tube
- S Atomizing tube
- V Throttle butterfly
- V<sub>1</sub> Choke (strangler)
- W Mixture control for idling
- Y Main jet carrier

#### Idling

The pilot jet, g, with extension pipe, feeds fuel to the engine at low revolutions. The mixture adjustment screw, W, makes possible an exact adjustment of the fuel/air mixture at low speeds. The idling speed of the engine may be adjusted by setting the idling adjustment screw.

#### Main carburetor

During normal running the engine is fed with fuel through the main jet, G, whilst air enters via the choke tube, K, (retained in position by a screw). The richness of the mixture is determined by an air intake, the size of which is governed by the air correction jet, a. Below the air correction jet there is a tube with a number of holes in its sides. This atomizing tube, S, must not be altered or exchanged for a tube of any other type.

#### Float chamber

The level of the fuel in the float chamber is governed by the hinged double float, F, which actuates the needle valve, P, thus opening or closing the fuel supply hole. This arrangement ensures a regular and constant fuel level and thereby a correct supply to the engine at angles of tilt up to 30° in any direction.

#### Excess fuel suction tube

When the engine is run at low revolutions, it can happen that excess fuel collects in the carburetor air intake. To prevent leakage of this fuel a suction tube, e, is provided. The lower end of this reaches to the lowest point in the air intake and the upper end is connected to the induction pipe above the throttle.

#### Choke (strangler)

When starting a cold engine, close the choke to ensure a richer

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fuel mixture. The choke is controlled by a lever attached to the choke spindle. The lever can be remotely controlled by means of the choke table.

#### Drain cock

At the lower part of the float chamber there is a drain cock. This is to allow draining of contaminated fuel. When changing fuel the remains of the former fuel should be drained through this cock.

#### Fuel filter

It is recommended to fit a fuel filter in the supply line from the tank to engine. A filter fitted in a safeguard against foreign bodies and/or water finding its way to the carburetor. When two fuel tanks are fitted for engines running on petrol/paraffin (gasoline/kerosene) then two filters should be installed, one in each fuel line. Remember to clean the filters at regular intervals.

## ELECTRICAL SYSTEM

### Magneto ignition (Engines O-11 and U-11 Comb)

#### Magneto

The engine is fitted with a magneto with a built-in impulse starter of SEM manufacture. The magneto has a rotating permanent magnet which is cast in one piece with the magnet poles and the spindle ends and forms the magneto rotor. The sensitive parts such as the windings and condenser are stationary. The contact breaker is also stationary and of the same construction as a car engine distributor which is fully enclosed in a metal cover.

#### Ignition timing

A timing lever, A, is fitted to the contact breaker housing (fig. 17). If the timing lever is moved as far as possible in the direction of rotation of the distributor shaft (anti-clockwise), retarded ignition is obtained. If it is moved in the other direction (clockwise), advanced ignition results.

#### Short-circuiting device

The magneto is fitted with a spring-loaded short-circuiting push button C (fig. 17). Depression of the button short-circuits the primary current and thus cuts off the ignition and stops the engine. Short-circuiting of the primary current can also be accomplished by a wire to the body of the engine, connected to a terminal screw D on the magneto cover.





Fig. 17 Magneto for B-1 and F-1 Series

- A Timing lever
- B Spring clip
- C Advance/retarding screw
- D Terminal screw

#### Parts and Identification

The magneto requires little attention as a rule, but a periodic inspection is recommended, especially the engine's overhauls.

#### Lubrication

The ball bearings on the magneto are supplied with the factory ready filled with special grease, which does not require renewal for several years. Changing the ball bearings and re-lubricating them with grease should preferably be done by a specialist. Ball bearing grease with a high boiling point should be used.

#### Replacement of Ignition Lead

If cracks, or other damage, are seen on the insulation of the ignition lead, this should be replaced by a new lead.

1. Loosen the magneto cover and fan lead socket.
2. Pull out the ignition lead.
3. Do not bare the new lead, but strip at least a 25mm.
4. Open the rubber bushing or back it up 12mm (1/2") out to the lead.
5. Press the lead into the high-tension contact, and as far as it will go.
6. Tighten and tighten the cover nut for the lead socket, which will press the rubber bushing into the right position.

#### Contact Brushes

The contact brushes must be checked from time to time. If the points are not clean they should be polished with a fine file, or if one is not available, then with fine emery cloth, which afterwards must be rubbed or total dirt point between the points on an emerying wheel. Cleaning may be done with a piece of damp cloth. The contact gap should be 0.4 mm (0.016"). A 25mm square is provided on the adjustment square for checking this.

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When adjusting the contact breaker, slacken the screw A, Fig 18, but not so much that the contact plate B can move from its position. Set the screw over head of the adjustment pointer in the groove C and turn to the left or the right according to whether advance or retard is required. After adjustment, tighten screw A.

If the spark plug is removed from the engine start for any reason, check carefully when replacing that it is correctly positioned. The closed valve is to be drawn towards the breaker cover.

If the breaker arm B must be replaced, slacken the nut E with the spanner and remove the retaining spring G. The lubrication groove on the breaker spindle should be filled with ball bearing grease before screwing the new arm in place.

Apply a few drops of engine oil to the inlet and outlet passages, and to the contact breaker housing K as replaced. Lubrication groove of the spark plug with ball bearing grease before fitting.

If the tension must be replaced, slacken nut F and use retaining screw with washer under the regulator cover.

#### Final Ignition Adjustment

The magneto is correctly tuned in the factory. If the magneto has been removed from the engine and any adjustment is required, proceed as follows:

1. Set the piston of cylinder No. 1 (farthest from flywheel) at top dead centre and check that both valves are closed.
2. Set the timing lever to normal position.
3. Rotate the breaker cover.
4. Hold the ignition lead for the sparking plug of cylinder No. 1 some millimeter (a distance of an inch) from the top of the magneto. Turn the driving spindle in its correct direction of rotation until a spark is seen. Check and adjust the 1/16" - 1/8" interval by turning the breaker contact with the

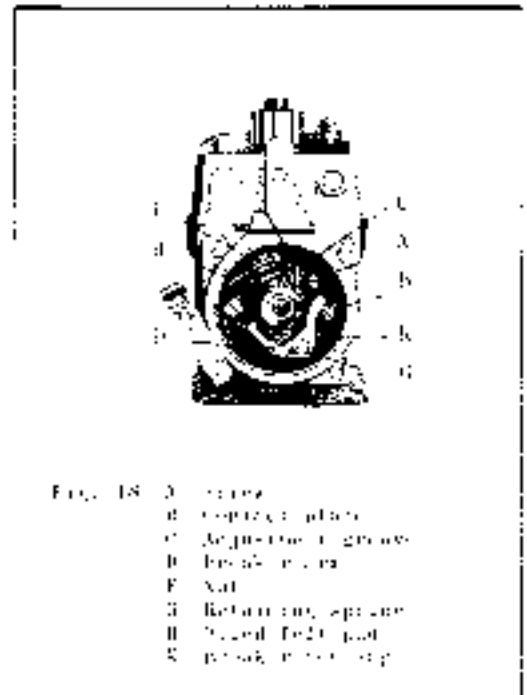


Fig. 18 Magneto adjustment

- A Timing lever
- B Contact plate
- C Adjusting groove
- D Breaker arm
- E Nut
- F Retaining spring
- G Spring clip
- K Spark plug cap

repeatedly slide down into distributor until the spark is started. Turn the starting spindle until it starts to rotate and immediately turn the breaker forward to rest upon the cam against which the breaker contact previously rested when the spark was noticed.

Run the engine the right way up, out of the plane of the screen.

6. Refill the breaker cover.
7. Final adjustment of the contact must be done when the engine is running so that the breaker will work properly with normal engine vibration. When the engine is running, the timing cover should be removed in the advance position.
8. Slide the breaker in and out until it is in that position where the breaker is fully facilitated by the main field coils in the magnet.
9. Set the magnet in the position that will give maximum engine revolution without causing knocking.
10. Tighten the magnet mounting nuts.

#### Full Operation

(Figures 3-21, 3-22, 3-23, 3-24, 3-25 and 3-26)

This system operates with an uncommutated battery, operates as a spark distributor, when the rotation is switched on and the contact breaker points closed. The work primary winding is energized by a low-tension current from the battery and is of a powerful magnetic nature of the core. As soon as the contact points open, the primary current is cut off and the secondary is powered by induction of the main secondary winding, which is housed through the distributor in the space of the spark coils. It is made impossible sparking at the contact breaker is prevented by a condenser in parallel.

#### Insulation

The distributor is provided with a rubber advance rubber.

#### Lubrication of distributor

Every 150 hours

1. Lubricate distributor cap spring bearing by greasing down grease from the distributor body and then refill with 3/4 oz. of 20 grease or equivalent.
2. Lubricate with light oil the distributor body bearing with grease or bearing oil from the distributor or equivalent.

#### Check for leaks and repairs

1. Spread a very thin layer of grease on the cap surface. Apply a little grease in the cover slots

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of the breaker spring and also smear the breaker contact spring with 1/2 oz. of grease. For lead grease or equivalent.

2. Thoroughly grease the breaker spring and the contact points. After completely fill the hollow space with the grease. For each 1/2 oz. of 20 grease or equivalent.
3. Pack the hollow space in the spindle under the distributor with lead grease or grease or equivalent.

#### Energy general adjustment

Set the distributor to a general set for suspension and adjustment as well as lubrication of distributor. Then the distributor is adjusted. N.B. Do not allow grease to come in contact with distributor contact points.

#### Adjustment contact breaker

Check the contact breaker frequency of the points are in a clean, polished with a fine file. Check adjustment. Various things are done between the points. Final adjustment may be done with a parallel-ground file.

Point gap should be .015 in (0.457) and may be checked with the feeler gauge. To adjust, rotate the distributor. Fully adjust the distributor adjustment. Check the left or right for greater or less gap as required. After adjustment is taken over 2 points, 21 contact plate 2 may be replaced. points - row 2, 20 point adjuster up 1/16 in. permits removal of the breaker gap. A way to check contact gap is to reposition of the breaker gap and the contact plate.

#### Adjustment adjustment

Check the adjustment of the distributor. The distributor is currently adjusted. Skewed, and removed from the engine. The distributor will require adjustment of skew, explained in this as follows:

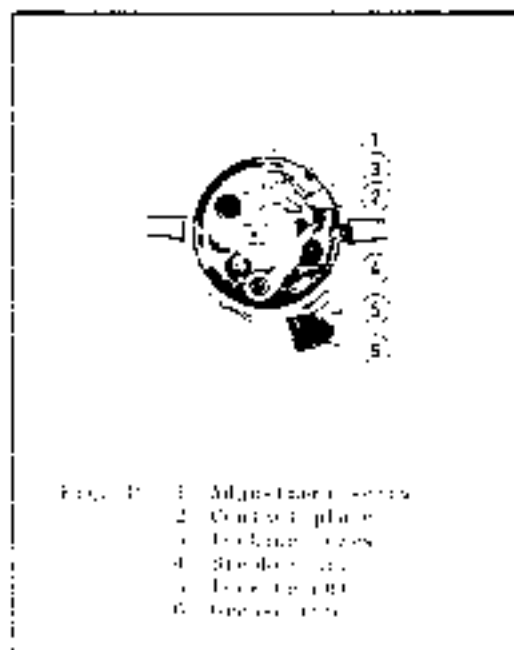


Fig. 17 1. Adjustment screw  
2. Contact plate  
3. Contact screw  
4. Distributor body  
5. Contact point  
6. Contact screw

- 1 Turn engine to bring No. 1 piston (furthest from flywheel) to top dead centre and check that both valves are closed.
- 2 Remove distributor cover.
- 3 Turn distributor spindle in normal direction of rotation until contact breaker starts to open, at the same time as the distributor rotor arm points to the ignition contact in the cover. This is distinguished on the outside of the cover by a vertical line beside the ignition lead connection. (The ignition lead from this terminal is connected to No. 1 cylinder spark plug.)
- 4 Loosen distributor in position and secure.
- 5 Fit distributor cover.
- 6 Connect ignition leads for firing order 1 - 2 - 4 - 3, i.e. the lead from the marked terminal is connected to No. 1 cylinder spark plug; lead 2, whose contact point is the next in sequence passed by the breaker arm when the engine turns in its normal direction of rotation, is connected to No. 2 cylinder spark plug; lead from connection 3 is connected to No. 4 cylinder spark plug; and the lead from connection 4 is connected to No. 3 cylinder spark plug.
- 7 Final checking of the ignition must be performed with the engine running under full load, properly warmed to normal cooling water temperature. Slacken the distributor retaining bolts slightly to permit running of the unit.
- 8 Turn distributor to the position at which the engine gives maximum r.p.m. without knocking.

(Ignition is advanced by turning the distributor housing in opposite direction of rotation of the distributor spindle and retarded by turning the distributor housing in normal direction of rotation of the distributor spindle.) Finally, tighten the distributor retaining bolts.

#### Battery

Keep the battery terminals and the terminal clamps free from oxidation and dirt. It is advisable to smear these parts with consistent grease. Check the electrolyte level every week during warm weather, and every second week during cold weather. The correct level is about 10 mm (just under 1/2") over the battery plates. Use only distilled water for topping up.

Secure the battery absolutely firmly in the boat, bearing in mind sea motion. Place the battery in a well-ventilated position.

#### Spark plug

Clean the spark plugs at regular intervals, also checking the spark gap. This should be 0.6 mm (0.024") at magneto ignition and 0.7 mm (0.028") at coil ignition.

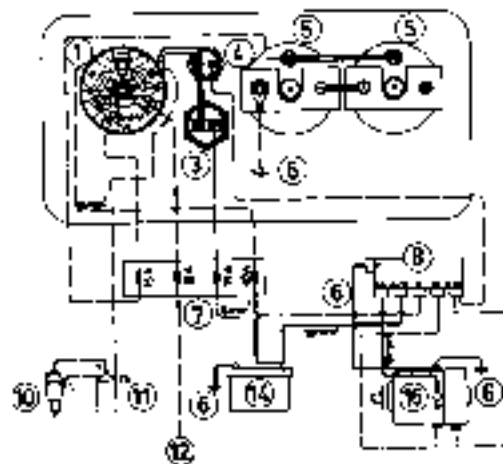
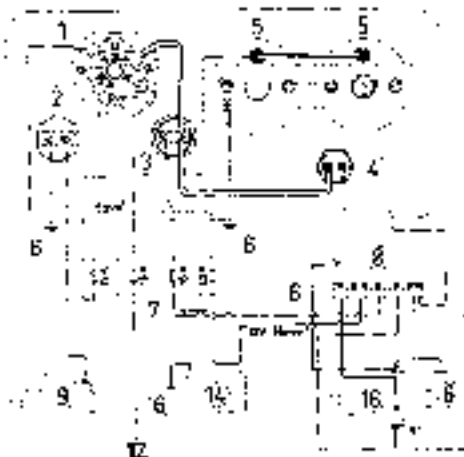
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FIG. 20 Wiring diagram

**B** Wiring diagram for engine with coil ignition, electric equipment and switch box Bosch SH/KSA 1/3.

**C** Wiring diagram for engine with magneto ignition, dynamo and switch box Bosch SH/KSA 1/3.

**D** Wiring diagram for engine with coil ignition, dynamo, starter and switch box Bosch SH/KSA 1/3.



- |                          |                          |
|--------------------------|--------------------------|
| 1 Switch box             | 9 Magneto                |
| 2 Stop button            | 10 Distributor           |
| 3 Starter button         | 11 Ignition coil         |
| 4 Charging control light | 12 Connection for lights |
| 5 Instrument lighting    | 13 Starter motor         |
| 6 Engine body            | 14 Battery               |
| 7 Fuse box               | 15 Dynamo                |
| 8 Current limit relay    | 16 Dynamostarter         |

Cable cross-section area should be 2.8 mm<sup>2</sup> (0.009 sq.in.) if not otherwise stated. If cable length exceeds 7 m (22.4 feet) larger area should be used. When relay is mounted on dynamo, cables between relay and dynamo are excluded.

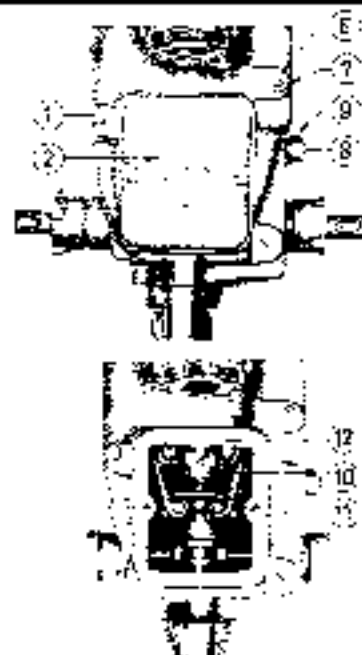


Fig. 21 1 Locking pin  
2 Locking pin cover  
3 Adjustment screw for lock pin  
4 Locking pin  
5 Adjustment screw for lock pin  
6 Locking nut  
7 Adjustment nut  
8 Stop screw  
9 Locking washer  
10 Locking pin  
11 Locking pin cover  
12 Locking washer

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### Adjustment of reverse gear—engine type 30 and 31

#### Adjustment of brake band

If slipping occurs when running below 1000 rpm, check by edge fitting. It is as in Fig. 21.

1. Loosen the locking nut 7.
2. Turn adjustment screw 8 clockwise a turn or two until it is just tight on locking nut 6.

If this adjustment is insufficient, repeat the process.

#### Adjustment of bearing pin 11 and

This adjustment should be made only when the bearing is running. The working temperature of the propeller shaft is the same with the engine when the control lever is at neutral, provided the following:

1. Start the locking nut 9, Fig. 21.
2. Turn the adjustment screw 8 to the left until the shaft vibrates freely.
3. Tighten the locking nut 9.

Slide the shaft into gear and engine rotation. Turn the adjustment screw to the right.

#### Adjustment of stop pin 11

If the clutch slips when running, adjust as follows:

1. Loosen the stop screw 11, Fig. 21.
2. Start the stop screw 11, Fig. 21, until it is clear of the groove in the locking washer 11.
3. Turn the adjustment nut 10 to the right until it

### Ignition system—tappet and advance

The electrical equipment is not normally repaired. It is checked by means of a voltmeter with advance. The distributor cap is checked by a sheet of 1000 volt paper every second year or when the engine is overhauled.

The tension of the V-belt is checked and the belt replaced at intervals. The belt should be replaced if it is worn or if it is cracked. The V-belt is from V-belt 2 D 11 anyway however the diameter and type is not given.

An engine with starter and system cannot start if the lead is not in the starter ring of the 4 speed gear & vice versa for Bosch 30 & 31 engine with equivalent.

### Oil—oil splash

#### Lubrication

The oil quantity of the reverse gear should be checked as in 30-31 and 31-1. For 1.75 hp engine, 2.0 for 2 hp, 3.0 for 3.0, 3.0-4.0 for 4.0, 4.0 for 4.5 hp engine, 4.5 for 5 hp engine, 5.0 for 5.5 and 6.0 for 6.0 hp engine. The inspection opening after reverse for the reverse, 3.0 for 3.0 and 4.0 should be filled through a special inspection opening. A direction is provided for working the level. For 30-31 and 31-1, the oil level and oil type will remain the same. The reverse gear are checked by the oil level.

For the engine, the reverse gear oil must be changed after about 200 hrs running. The oil is every 200 hours. The oil can be drained through the plug under the reverse gear housing. Should this be an accident, lock out the oil with a caution plug through the plug from opening. Note: After the water lay-up the oil must always be changed regardless of how long the oil has been used.

stop screw 11 reaches the stop groove in the locking washer.

1. Tighten the stop screw 11 until
2. Replace the stop pin cover.

Adjustment of the nut 10 and groove to the next or partially sufficient. The work of adjusting is very fast. An adjustment of two or three grooves may be necessary.

### Adjustment of reverse gear—engine type 30 and 31

#### Adjustment of bearing pin 11 and

Normally the bearing pin 11 and the reverse gear housing will not require changing unless the bearing housing has been replaced. If adjustment is required, proceed as follows:

1. Start the locking nut 9, Fig. 21. This next part.
2. Turn the adjustment screw 8 to the left until the shaft vibrates freely.
3. Tighten the locking nut 9.

#### Adjustment of stop pin 11

This adjustment should be made when the engine is running. If the propeller shaft vibrates when the control lever is at neutral, proceed as follows:

1. Start the locking nut 9, Fig. 21.
2. Turn the adjustment screw 8 to the left until the shaft vibrates freely.
3. Tighten the locking nut 9.

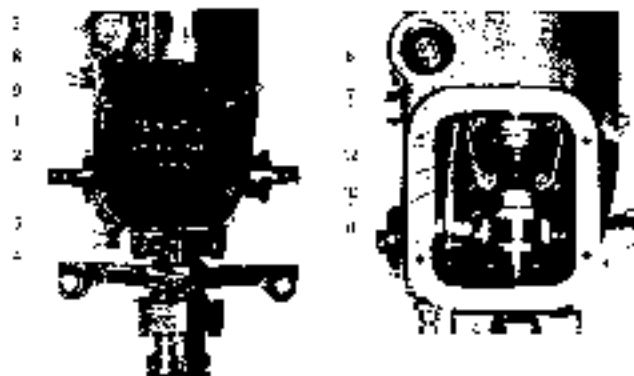


Fig. 20 Reverse gear assembly (left)

1. Oil dipstick
2. Grease gun nozzle
3. Oil filler cap
4. Inboard adjustment screw
5. Locking nut
6. Adjustment stop for stroke limit
7. Locking nut
8. Axial adjustment screw
9. Locking nut
10. Adjustment nut
11. Stop screw
12. Locking washer

Adjust the shaft to the desired engine rotation, turn the adjustment screw to the left.

#### Adjustment of Stroke Limit

The operation of the shift lever system can be checked by engaging reverse (Fig. 22) after removal of oil filler cap.

1. Loosen the locking nut 7.
2. Turn the adjustment screw (item 4) to the left (right).
3. Lock on the locking nut 7.
4. Test adjustment as described, repeat the process.

#### Adjustment of Gear Ratio

Adjustment of gear ratio when running slowly, adjust as follows:

1. Remove the propeller cover.
2. Slacken the stop screw 11 (Fig. 22) (1) at the rear of the groove in the locking washer 12.
3. Turn adjustment nut 10 to the position of the stop screw 11 (marked 10) at the groove in the locking washer 12.
4. Tighten the stop screw 11 (marked 10).
5. Reattach the propeller cover.

Adjustment of the gear ratio can only be done by a normally skilled person. However, if slipping is very bad then an adjustment on these three gears will be necessary.

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### REPAIRS AND

#### Engine (See 10, 11 and 15-17)

The induction gear can also adjust (item 11) in operation. The 08 part of the 2001 is through the fitting opening when possible. If necessary, check the cover with the oil dipstick. For 2001 set up on a level surface. With a wrench place the oil in the induction gear until it changes when the limit 25 (marked 10) is reached every 100 hours from the gear box by counting the plug on the induction. If slide on induction, check with a wrench. The oil can be pulled through the dipstick hole. Always follow the oil after the starter assembly regardless of how often the oil is changed.

### STARTING PROBLEMS

See also 15, 16 and 17 by engine.

#### Starting system

1. Disconnect with the oil.
2. Fuel pump switch off or cracked fuel line.
3. Valve on the fuel.
4. Check assembly of wires.
5. Adjust or replace sparking plug. It is also possible that the gear is running.
6. Oil level is short position. Turn over starter gear.

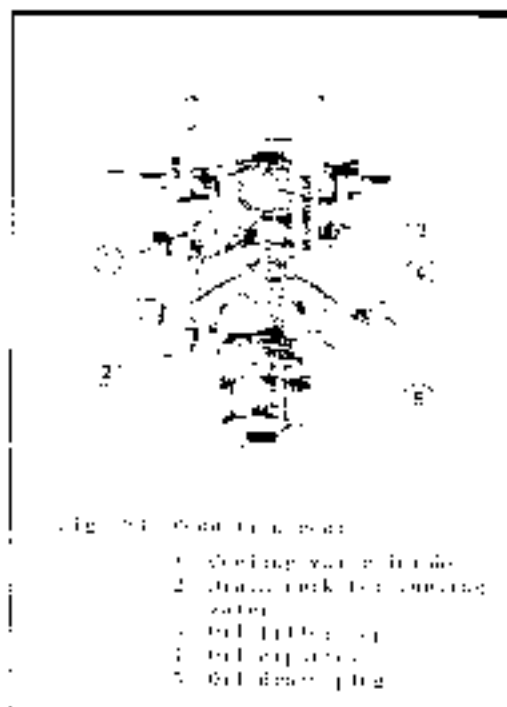


Fig. 21 Gear train view

1. Sliding valve for the oil
2. Drain plug for cooling water
3. Oil filler cap
4. Stop screw
5. Oil filler plug

#### Sudden stopping

- 1 Empty fuel tank.
- 2 Choked fuel tank air vent.
- 3 Water in the fuel.
- 4 Dirt or water in the carburettor or in the fuel pipe.
- 5 Ignition failure.
- 6 Weak fuel mixture.

#### Poor performance, uneven running

- 1 Bad compression due to leaking valves or faulty cylinder head gasket.
- 2 Too weak, or too rich, fuel mixture.
- 3 Faulty valve springs, these can have settled.
- 4 Incorrect valve clearance.
- 5 Irregular ignition due to a faulty plug, a faulty magnet or distributor.

#### Knocking

- 1 Hard or sandy carbon deposits in the combustion space.
- 2 Excessively advanced ignition.
- 3 Fuel with too low octane value.
- 4 Slack piston.
- 5 Slack connecting rod.

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#### ANTI-CORROSION TREATMENT

##### for ALBIN marine engines before winter lay-up

During the winter engines run the risk of being damaged by corrosion in the combustion system as well as in the cooling system. It is nearly true to say that a marine engine is never WORN OUT, because of the small number of hours - 200 - 300 a year - that the engine in a normal pleasure boat works. Instead, the engine is worn out gradually by corrosion. Therefore you can radically prolong the life of your engine by giving thorough anti-corrosion treatment in the autumn before laying up the engine for the winter.

#### Corrosion protection of engine interiors

##### Inner moving parts

- 1 Preferably de-carburize the engine.
- 2 Drain water oil and fill up with anti-corrosive oil (see specification to the right).
- 3 Empty the fuel tank and clean the whole fuel system.
- 4 Pour in anti-corrosive fuel sufficient for about one hour's running. Suitable mixture is 90-octane petrol (gasoline) and 5% anti-corrosive oil, Albin Motor's part No. 49768.
- 5 Run the engine for about one hour.

#### Anti-corrosive oils for inner moving parts

Shell	Fuchs Oil 30
Esso	Kustan 620
Gulf	Gulf 50-Red Engine Oil 50, 1
Castrol	Preparative Oil 30
BP	Esso Protective Oil 30
Castrol	Castrol Storage Oil
Mobil Oil	Mobil Kote 50
Valvoline	Insta. 270

### Anti-corrosive Fluids for cylinder jackets

Shell	Dona C
Fess	Rust Ban 392 (not available)
Gulf	Gulf Cut 51 A
Caltex	Radjantex
BP	Soluble Oil 70 Frongel FR 4
Castrol	Jicelox 5 (1/2%)
Mobil Oil	Mobil-oate 205
Valvoline	Decyl S. D 300+

### Cylinder jackets

- 1 Drain the cooling water system.
- 2 Remove the thermostat housing from the cylinder head together with the pipe from front of engine from water pump. With older engines remove the pipe to forward end of engine together with the temperature regulator cock.
- 3 Plug the cooling water pump outlet (i.e. between the pump and the pipe connected to the cylinder block). Anti-corrosive fluid must not enter the pump.
- 4 Pour in anti-corrosive fluid through the thermostat hole (or temperature regulator cock) until the whole cooling system is filled. Rubber parts as hoses etc. may be affected by the anti-corrosion fluid.

The cylinder jackets capacity is for 0-11 0,67 litres (1,4 imp.pints, 1,4 US pints), for 0-21 1,25 litres (2,2 imp.pints, 2,7 US pints) and for 0-41 and 0-41 4,7 litres (8,3 imp.pints, 10,0 US pints).

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### Corrosion protection of engine exterior

All unpainted outside surfaces, such as the hull parts of the exhaust pipe, control lever, engine installation, bolts etc. should be oiled with a suitable anti-corrosive oil.

### Corrosion protection of electrical parts

The electrical items are impregnated with lacquer which perfectly resists storing in a damp and cold atmosphere. Nowadays it is thus not necessary to dismantle the electrical equipment from the engine in order to store these parts in a warm room, on the other hand it is beneficial to grease the contact surfaces with preferably a white insulator.

With older engine types you should as a rule remove the electrical equipment in order to store it in a warm room.

It is good practice to have the electrical equipment overhauled by a specialist once every two or three years.

### When preparing the engine for use again

Draw off the anti-corrosive fluid from the cylinder jackets and fit the thermostat (or temperature regulator cock) and all connections. Fill with the recommended lubricating oil and fuel in the usual way and then the engine is ready to be run.

### Anti-corrosive oils for outside corrosion protection

Shell	Ensis Fluid 254 or 255
Fess	Rust Ban 395 or Rust Ban 392 (obtainable in spray bottle)
Gulf	NO-Rust 3
Caltex	Rust-proof Compound 5
BP	Frongel Rust Preventive Compound
Castrol	Castrol 40 (spray bottle)
Mobil Oil	Mobil-oate 303
Valvoline	Decyl 300 (spray bottle)

TECHNICAL DATA	0-11	0-21	0-41	0-411
Number of cylinders	1	2	4	4
Cycle	4-stroke	4-stroke	4-stroke	4-stroke
Bore	78 mm 3.07"	78 mm 3.07"	76 mm 3.07"	78 mm 3.07"
Stroke	92 mm 3.62"	92 mm 3.62"	92 mm 3.62"	92 mm 3.62"
(cylinder capacity)	0.14 litres 27 cu.in.	0.28 litres 34 cu.in.	1.78 litres 107 cu.in.	1.78 litres 107 cu.in.
Compression ratio				
Petrol (gasoline) version	5.0:1	5.0:1	5.0:1	6.3:1
Paraffin (kerosene) version	4.5:1	4.5:1	4.5:1	5.0:1
Compression at full throttle and 200 rpm (starter rpm)				
Petrol (gasoline) version	8 kg/cm <sup>2</sup> 85 psi	6 kg/cm <sup>2</sup> 83 psi	6 kg/cm <sup>2</sup> 85 psi	7 kg/cm <sup>2</sup> 100 psi
Paraffin (kerosene) version	5 kg/cm <sup>2</sup> 71 psi	5 kg/cm <sup>2</sup> 71 psi	5 kg/cm <sup>2</sup> 71 psi	5.3 kg/cm <sup>2</sup> 75 psi
Maximum torque				
Petrol (gasoline) version	2.31 mkg 1300 rpm	1.05 mkg 1100 rpm	0.35 mkg 1300 rpm	11.81 mkg 2000 rpm
Paraffin (kerosene) version	1.93 mkg 1300 rpm	0.88 mkg 1300 rpm	7.82 mkg 1300 rpm	6.95 mkg 2000 rpm
Output at 1500 rpm to 111 2500 rpm)				
Petrol (gasoline) version	5.332 hp	12.537 hp	24.241 hp	42.241 hp
Paraffin (kerosene) version	5.332 hp	12.537 hp	21.241 hp	32.241 hp
Fuel consumption at 1500 rpm (0-211 2500 rpm)				
Petrol (gasoline) version	235 g/bhp/h 0.72 lb	290 g/bhp/h 0.53 lb	240 g/bhp/h 0.53 lb	255 g/bhp/h 0.52 lb
Paraffin (kerosene) version	250 g/bhp/h 0.57 lb	260 g/bhp/h 0.57 lb	260 g/bhp/h 0.57 lb	280 g/bhp/h 0.63 lb
Inlet clearance with cold engine				
Inlet valve	0.20 mm 0.008"	0.20 mm 0.008"	0.20 mm 0.008"	0.20 mm 0.008"
Exhaust valve	0.20 mm 0.010"	0.25 mm 0.010"	0.25 mm 0.010"	0.20 mm 0.010"

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	0-1	0-21	0-41	0-411
Oil capacity, engine	6.5 litres 6.9 Imp.pints 1.9 US pints	1.4 litres 2.6 Imp.pints 3.0 US pints	4.3 litres 8.8 Imp.pints 7.0 US pints	5.0 litres 8.5 Imp.pints 10.6 US pints
Oil pressure with warm engine	1.5-2.5 kg/cm <sup>2</sup> 20-35 psi	1.5-2.5 kg/cm <sup>2</sup> 20-35 psi	1.5-2.5 kg/cm <sup>2</sup> 20-35 psi	2.0-3.0 kg/cm <sup>2</sup> 26-43 psi
Oil capacity, reverse gear	1.3 litre 1.8 Imp.pints 2.1 US pints	1.0 litre 1.8 Imp.pints 2.1 US pints	1.7 litre 3.0 Imp.pints 3.6 US pints	1.7 litre 3.0 Imp.pints 3.6 US pints
Oil quality	Service MM	Service MM	Service MM	Service MM
Oil viscosity				
above 45° C (100° F)	SAE 30	SAE 30	SAE 30	SAE 30
below 45° C (100° F)	SAE 20	SAE 20	SAE 20	SAE 20
Ignition system	Magneto	Battery	Battery	Battery
Wagner, SEM	11-1H 30	-	-	-
Distributor, Bosch	-	3V 2,61 41	1E 4 CR 300	1V 4 CR 300
Contact breaker gap	0.4 mm 0.016"	0.4 mm 0.016"	0.4 mm 0.016"	0.4 mm 0.016"
Spark plug, Bosch	W 45 J 1	W 45 J 1	W 45 J 1	W 145 J 1
Spark gap	0.5 mm 0.020"	0.7 mm 0.028"	0.7 mm 0.028"	0.7 mm 0.028"
Electric system	12 Volt	12 Volt	12 Volt	12 Volt
Carburettor, Solex	26 VBA	26 VBA	26 VBA	11*) 22 SV 12*) 26 VBA
Carburettor jetting				
Choke tube	50455/4/20	50455/4/20	B) 50455/4/18 E) 50455/4/20	B) 50455/4/20 E) -
Main jet	50552/1/85	50552/1/90	B) 50552/1/95 E) 50552/1/100	B) 50552/1/120 E) 50552/1/120
Correction jet	50612/160	50612/170	50612/165	B) 50612/210 E) 50612/165
Pilot jet	50004/40	50004/40	B) 50004/40 E) 50004/40	B) 50004/40 E) 50004/40
Fuel/air tube	52084/10	52084/10	52084/24	B) 52084/17 E) 52084/24
Needle valve	52844/1.5	52844/1.5	52844/1.5	52844/1.5
Floater	50559/9.1 g	50559/9.1 g	50559/9.1 g	50559/9.1 g

\*) B - Petrol (gasoline) version, E - Paraffin (kerosene) version



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The specifications and design information given in this book are not binding. We reserve the right to carry out modifications without previous notice.