

A REVIEW of the DOLPHIN ENGINE

The Dolphin Yacht Auxiliary engine is a twin-cylinder, 349cc, three-port, two-stroke engine with a fully automatic centrifugal clutch. The drive takes up at 1,200 r.p.m.; it does so soundlessly and without any snatch. A Siba Dynastart control unit looks after the starting stopping and reverse.

Remote controls are magnificently simple. A Bowden cable with a small lever controls the throttle, and that is the only mechanical linkage. Forward, reverse and neutral are achieved electrically via an 8 foot long wire loom. The drive is direct, and to go astern the engine rotation is reversed. This is done by another small lever beside the starter button on a control box. Push this lever forward, press the starter, and the engine ticks over until the throttle is opened. When the lever is brought back to the neutral position the engine switches off. It can then be brought back into the reverse position, the starter button pushed, and the engine will then rotate in reverse.

The Siba Dynastart is a combined starter and 90-watt generator built into the engine. The switchgear includes a voltage control regulator and cut-out, a 12/24 volt changeover switch, and the reversing switch. The 24 volts are used for starting the engine, but 12 volts are used for ignition and lighting the boat.

The engine is water cooled, and it has unusually large galleries. They provide a most effective sound barrier which, together with the four rubber mounting bobbins on the feet, make this an extremely quiet and vibration-free

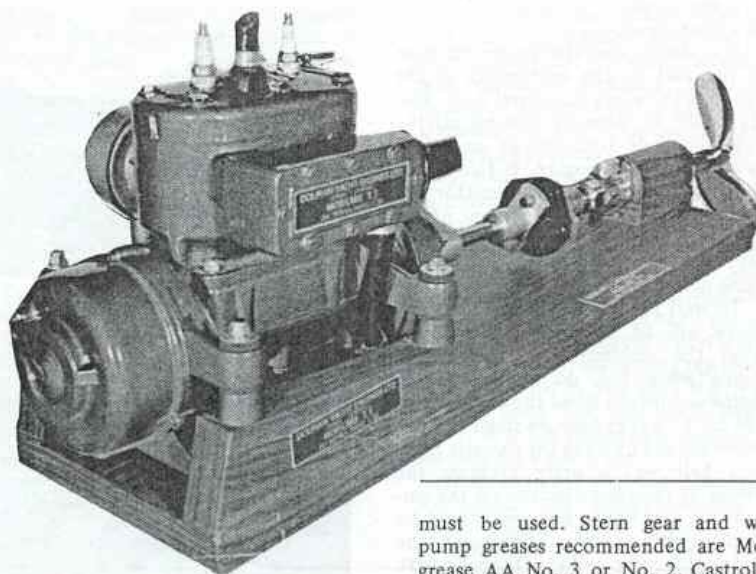
installation. The noise (and, of course, there is some) is quite unlike the chatter of a two-stroke. It is only a slight exaggeration if I say that it is more like a powerful purr.

The propeller shaft is flexibly mounted with a universally jointed Cardan shaft assembly. That makes installation much easier and it should therefore be that much cheaper. Fuel consumption must depend on the boat, the propeller, and how you run the engine; but one gallon an hour at full throttle or three hours on a gallon at half-throttle should easily be achieved.

To those who immediately think a two-stroke must soot up and need frequent plug changes and decoking, the makers say that it is a very clean engine. As there are no valves and seatings to burn, decarbonising is really unnecessary and they do not recommend it at all. The engine should they say, run for about five seasons before needing a major inspection. The mixture is one third of a pint of SAE 30 oil to one gallon of petrol.

The direct drive has been standardised after previous models were produced with reduction drives. It was found from experience that yachts up to 7½ tons did not need the extra poke provided by the reduction and the larger propeller, and the latter was just a drag.

There are two fuel mixture ratios permitted with this engine: 24/1 with Mobiloil "A" or equivalent or branded two-stroke oil, or 32/1 with filtrate colloidal two-stroke oil or Mobiloil "D". A 3-star or better grade petrol



must be used. Stern gear and water pump greases recommended are Mobilgrease AA No. 3 or No. 2, Castrolase L.M. or Shell Retinax.

The makers' instructions for starting and running the engine will seem all too obvious to anyone who has any idea how to run a two-stroke engine. But they are a little different from the usual, and they do make the point that this is not one of those press-the-button-and-never-touch-the-engine jobs.

Dynastarts do run hot to touch . . .

The stern tube inner bearing must be thoroughly lubricated by screwing down the greasecup. For starting and running first turn on the fuel cock and flood the carburettor lightly, depress the choke button, turn on the seacocks, and place the control lever in 'ahead' or 'astern' position as required. Place the throttle lever one-third open, press the starter button and as soon as the engine starts close the throttle lever and the engine is running, idling in neutral.

As soon as the engine has warmed up slightly, flick the throttle lever wide open momentarily and this will put the engine off choke. The desired speed may then be selected by the throttle lever. **IMPORTANT** - As soon as the engine starts, check that the cooling water is flowing. If the cooling system is working correctly it should always be possible to place your hand on the cylinder block, although the cylinder head will be too hot for this. The crankcase and Dynastart case both get hot, and on a long run will reach 80°C. Check that the inboard stern tube bearing is not overheating.

To change from 'ahead' to 'astern', or vice versa just ease the throttle and push the control lever straight through. But do not press the starter button until the engine has stopped. All crew members must be made aware of this.

How not to oil up a float chamber

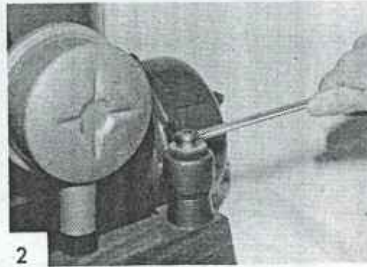
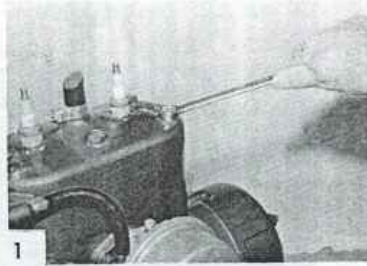
It is always desirable to use up most of the fuel in the carburettor if the engine is to be left for several days. This can easily be done by turning off the fuel cock half a minute or so before switching off the engine. If this is not done, the petrol in the carburettor will evaporate leaving the oil content of the fuel to remain, and this will make the next start difficult with the risk of oiling up the sparking plugs.

To start the engine when warm some choke will be necessary, but do not flood the carburettor. To start the engine when hot, do not choke the engine and do not flood the carburettor. The choke works only on small throttle openings, and opening the throttle more than half way entirely prevents the setting of the choke button on the carburettor. Generally, the aim should be to use as little choke and flooding of the carburettor as possible. Dispense with warming up. Start the engine and get it under load as quickly as possible. Long periods of idling should also be avoided; the Dolphin's reliable starting renders this unnecessary.

The clutch may be locked in neutral if desired for charging batteries on moorings, etc., and it may also be locked in drive. This is particularly useful if the correct automatic action is ever suspect, and guarantees the availability of the engine even in the unlikely event of a complete clutch failure at sea. The correct working of the clutch may be determined if, after a period of running at cruising rpm, the clutch drum feels cold.

The makers do not try to avoid the issue over sparking plugs oiling up in a two-stroke engine. They say that an owner will be lucky to get through a season without changing plugs. The symptoms of an oiled up plug are a definite loss of power and the oiled-up plug will feel cooler than the other one. So with this, or any other two-stroke, never go afloat (especially to sea) without a spare set of plugs. When changing plugs, screw the replacement in by hand and then tighten slightly with a plug spanner. Never tighten hard down.

WHEN a new engine has been run in (that is, after about 10 hours' running at cruising speed, never at full throttle for more than a few moments), all bolts must be tightened down. Go round the engine - cylinder head bolts (1), cylinder base nuts, engine mount nuts (2), exhaust manifold bolts, exhaust pipe flange nuts (3), and the coupling bolts (4).



It is after this period that the petrol/oil ratio can be reduced from 24/1 to 32/1, that is one pint of oil to four gallons of petrol, provided a top quality oil and 3-star or better petrol are used. And now great care must be taken with the mixing.

The makers claim that very little maintenance is required by the Dolphin engine, and in the maintenance manual only seven maintenance points are given and one of those covers what to do if the engine is immersed in sea water.

Ensuring that nuts and bolts are kept tight has been mentioned above, and these should be checked from time to time during each season, but there should be no adjustment necessary unless the engine has been allowed to overheat through a blockage in the cooling water system or by forgetting to

turn on the seacock. A periodic tightening of all electrical connections should also be done.

Once a month a tiny drop of thin oil should be fed to the contact breaker pad (5). Access is by removing the



contact breaker cover in the front of the Dynamotor cover (6). Contact breaker adjustment and timing are dealt with later. The sparking plugs should be cleaned and the gaps adjusted every 25 hours' running, the gap being 0.030 inch.



Jabsco water pumps should be lubricated with Mobilgrease AA No. 3 or underwater grease. The grease cup should be kept filled and the cup itself given a quarter turn (7) during each use of the engine. This cup must never be allowed to run or remain empty.

The water pump drive belt must be kept adjusted as, if it becomes slack, there will be a shortage of cooling water which might be serious. Adjustment is made by slackening off the retaining bracket nut (8). And then

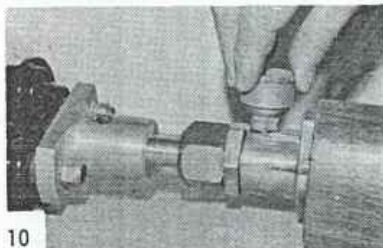


pulling the pump against the belt (9) to take up slack and then re-tightening the nut.

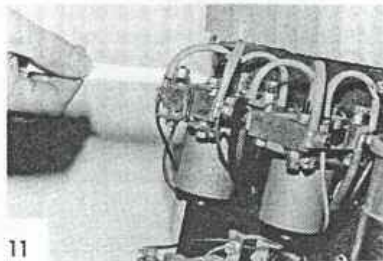
The stern gear must be kept well lubricated while running and, although it may be a bit of a bore, the grease cup



should be screwed down (10) as far as it will go every hour while running and repacked when empty.



The maintenance manual says that the electrical panel and remote control box must be kept dry, and Vaseline or a similar protective should be used to coat any surfaces showing signs of corrosion. The large number of contact breakers in the regulator box are not mentioned. They are designed to rub together on closing and so be self-cleaning. But if they do get a little dirty they can be cleaned using a drop of Thawpitt on a feeler gauge and by rubbing with a strip of very fine emery paper (11).



"If the engine becomes accidentally immersed in sea water, or flooded internally, proceed", they say, "as follows: Get the engine started immediately and run it hard and long. Squirt large quantities of oil down the carburettor intake. Remember Delay is Fatal.

With luck no damage will have been done to the engine itself. If electrical equipment becomes immersed in sea water, remove it from the engine, soak in fresh water, and return to us." Incidentally, they maintain a round-the-clock spares service.

Ignition timing has a procedure all its own for this engine. To check the ignition timing, or if the Dynastart has been removed or disturbed for some reason, proceed thus:

Remove both sparking plugs and rest them on the cylinder head with the plug leads still attached. Turn on the ignition and rotate the crankshaft (12) in the



normal running direction when the spark at the plugs can be easily seen. At the side of the rotor housing a hole three eighths of an inch diameter (13) through which you can see the flywheel rim. Now, if the crankshaft is rotated, two centre-punch marks will be seen diametrically opposite on the flywheel. These marks should be in the centre of the hole when the spark occurs. Provided the centre-punch marks are within the confines of the hole periphery, then the timing is accurate enough, the size of the hole provides a working limit of plus or minus two degrees.

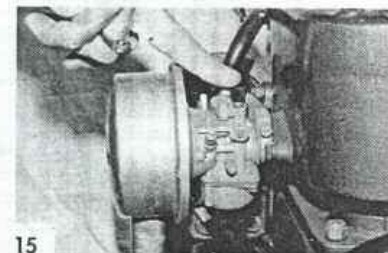


Should the timing be late for instance, the centre-punch mark will have come and gone *before* the spark occurs. To correct this the offending contact breaker must be identified and its gap increased slightly; this will advance its timing. The wires that go to the contact breaker are red and black; the red wire always goes to the front cylinder. Having made an adjustment to the gap, the timing should be rechecked and so on until the timing is correct.

In usage the gaps tend to close down and retard the ignition. However, if the cam is correctly lubricated, adjustment will seldom be necessary. There is no standard contact breaker gap with the Dynastart, and the Dolphin's makers do not intend to specify one. They say that they have found by experience that, in order to get the *same* timing on both cylinders, a different size gap is needed on each contact breaker, timing being more important than gap size. Smaller gaps tend to show up maladjustment much quicker than large ones, therefore upsetting the engine performance earlier. For this reason they say that the gaps must not be less than 0.015 inch and not more than 0.030 inch. Remember — it is the timing that matters, not the contact breaker gap.

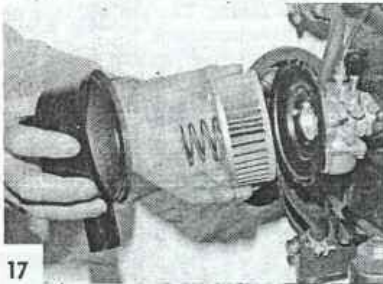
If it is found that the lesser gap is too small, the screws securing the whole contact breaker assembly should be slackened and the backplate turned clockwise using a screwdriver or small tool in the hole shown to turn the plate. The screws are then re-tightened and the contact breaker gaps adjusted to provide the correct timing. The gap will then be found to have increased.

The carburettor should need no adjustment after testing in the workshop before despatch. Photos (14) and (15) show the choke button in its unchoked and choked positions. The only adjustment that might need to be made is to the position of the throttle stop screw (16).



The makers lay down a very precise sequence for fault finding. They say:

1. "Check the quality of the spark at the H.T. leads. Remove the cover and allow the spark to jump to the spark plug terminal from which it was detached. If the spark will jump five sixteenths of an inch and the timing is correct, there is nothing wrong with the ignition system.
2. Check the sparking plugs, either by substituting them with known good ones, or by having the originals checked on a pressure test rig.
3. If the engine passes the first two tests, then dirt in the carburettor or fuel feed could be the cause of the trouble. The carburettor should be dismantled and carefully cleaned in accordance with the Zenith leaflet. Pay particular attention to the very small passages that make up the idler circuit as these are most likely to have become blocked. The carburettor can be upset by fitting the AC air cleaner element the wrong way round; the central hole must always be towards the carburettor (17).

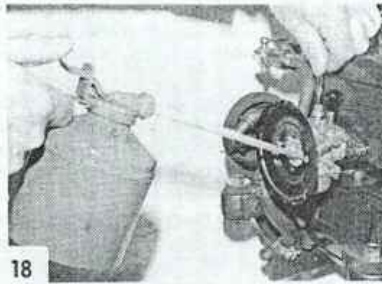


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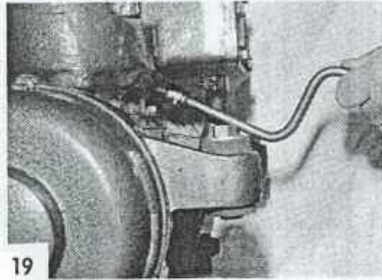
4. In the most unlikely case of the engine running badly, but passing checks 1, 2 and 3, have the cylinders checked by a competent mechanic. If the cylinders show a pressure of over 60lb. sq. in., then there is little wrong with the bores or piston rings.
5. Trouble can be caused by an air leak. Check for this by brushing a little petrol over the various joints while the engine is running slowly. If an air leak is present, the petrol will be drawn in and will alter the speed of the engine. By this means external air leaks can be quickly located. *The greatest possible care must be exercised when carrying out this test to obviate the risk of fire.* Air can also enter the crankcase through defective oil seals, but normally the seals outlast the main bearings, therefore the engine will have to be in a very advanced state of wear before they give trouble."

To inhibit the engine for laying up remove the air cleaner (remember to replace the air cleaner element with the hole facing the carburettor), run the engine, and squirt oil down the carburettor intake (18). Blip the engine

during this operation, about 6 shots from a squirt type oil can will be sufficient.



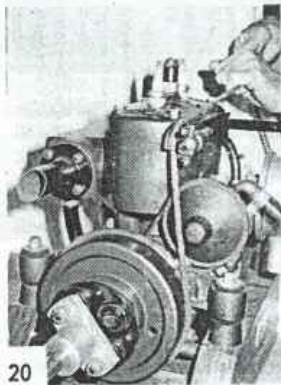
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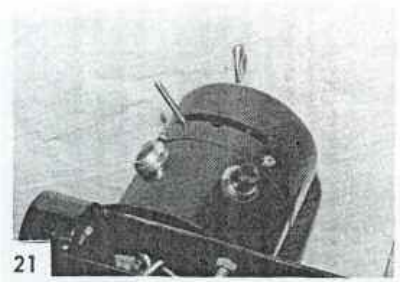
Always remove the cylinder block drain plug (19) and drain the block. Special care is necessary here as the Jabsco water pump will prevent the manifold draining. In addition to draining the cylinder block, either remove one of the two 1/2 inch dia. plugs in the rear engine mounting or remove the lower water pipes. Finally, run the engine for a few seconds, both ahead and astern, in order to expel the water from the water pump. Then squirt a little oil into the pump.

On engines after R.C.1675 a grease nipple is fitted to enable the grease in the thrust bearing to be changed. This is fitted immediately ahead of the clutch and requires no attention for two seasons' running. *Avoid over greasing.* Two strokes only must be given to a grease gun filled with a lithium-based grease.



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PULL



21

A very handy insurance is the notch in the rim of the flywheel which allows a starter cord to be used if the battery is flat (20). A fairlead on the cylinder block enables the cord to be pulled from above and behind the engine.

The control box showing the starter button, ignition light, forward and reverse lever and throttle lever (21).

Text and photos

by JOHN WATNEY

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