



Repair Instructions No. 4075.8 E

SACHS Snowmobile Engine

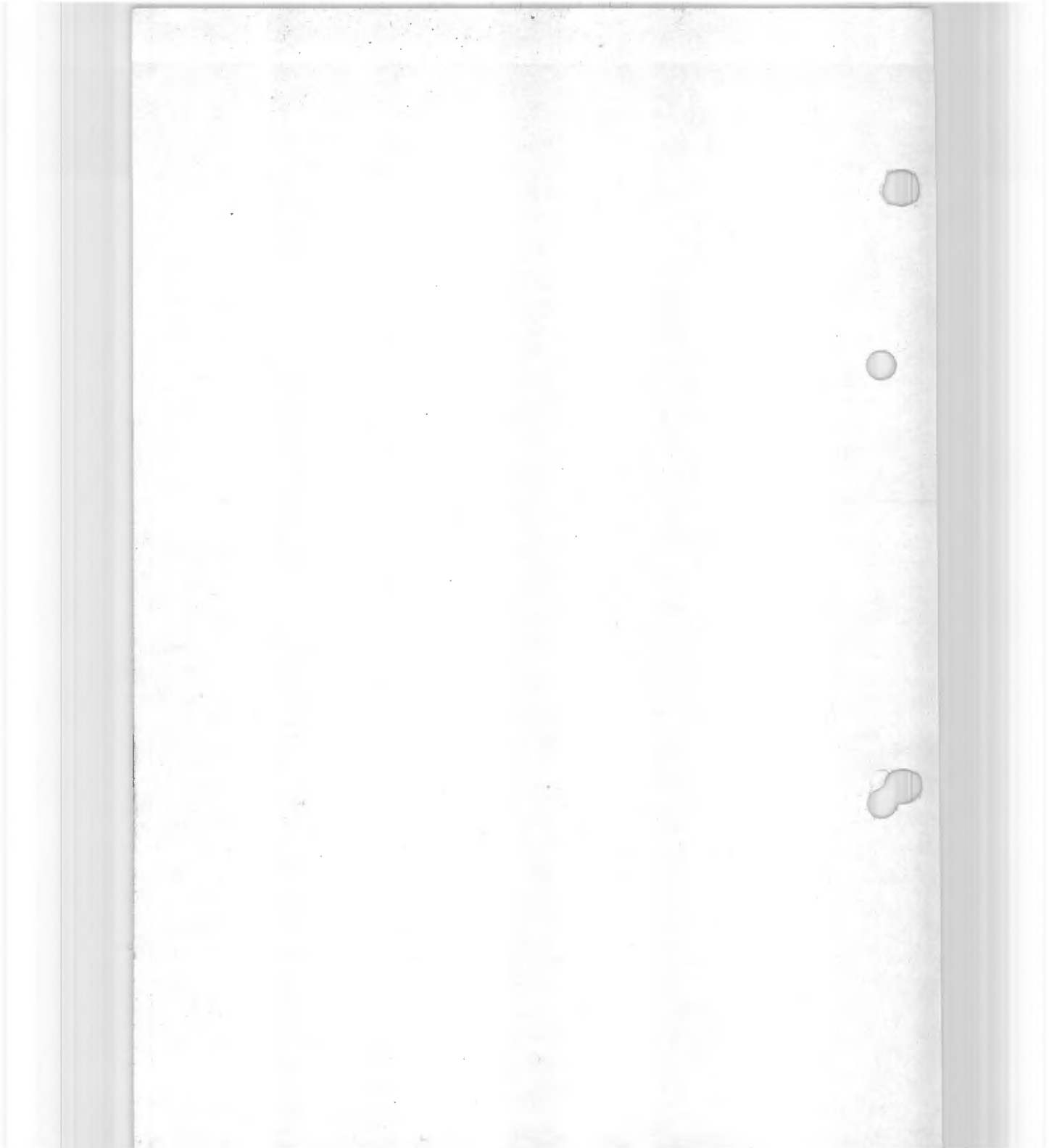
Type SA 340

340 SS (super sport)

370

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FICHTEL & SACHS AG · 8720 SCHWEINFURT



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PREFACE

This manual is designed to give dealers and their staff all guidance and information necessary to enable them to provide an efficient repair and maintenance service, but it is in no way intended as a substitute for the practical and theoretical training available to personnel at our customer service training school.

It will be found useful as a ready reference in day-to-day workshop practice. Our illustrated Spare Parts List, containing details of the various units and their construction, will also be found helpful when used in conjunction with this booklet.

Of course, good maintenance and repair work and efficient service to customers call for good equipment, a well fitted-out workshop, and trained personnel.

Dealers are requested to make this manual and all SACHS circulars containing technical information and modifications available to every individual responsible for actual servicing. It is emphasized that all information of this nature is intended for use in the workshops and not for office filing.

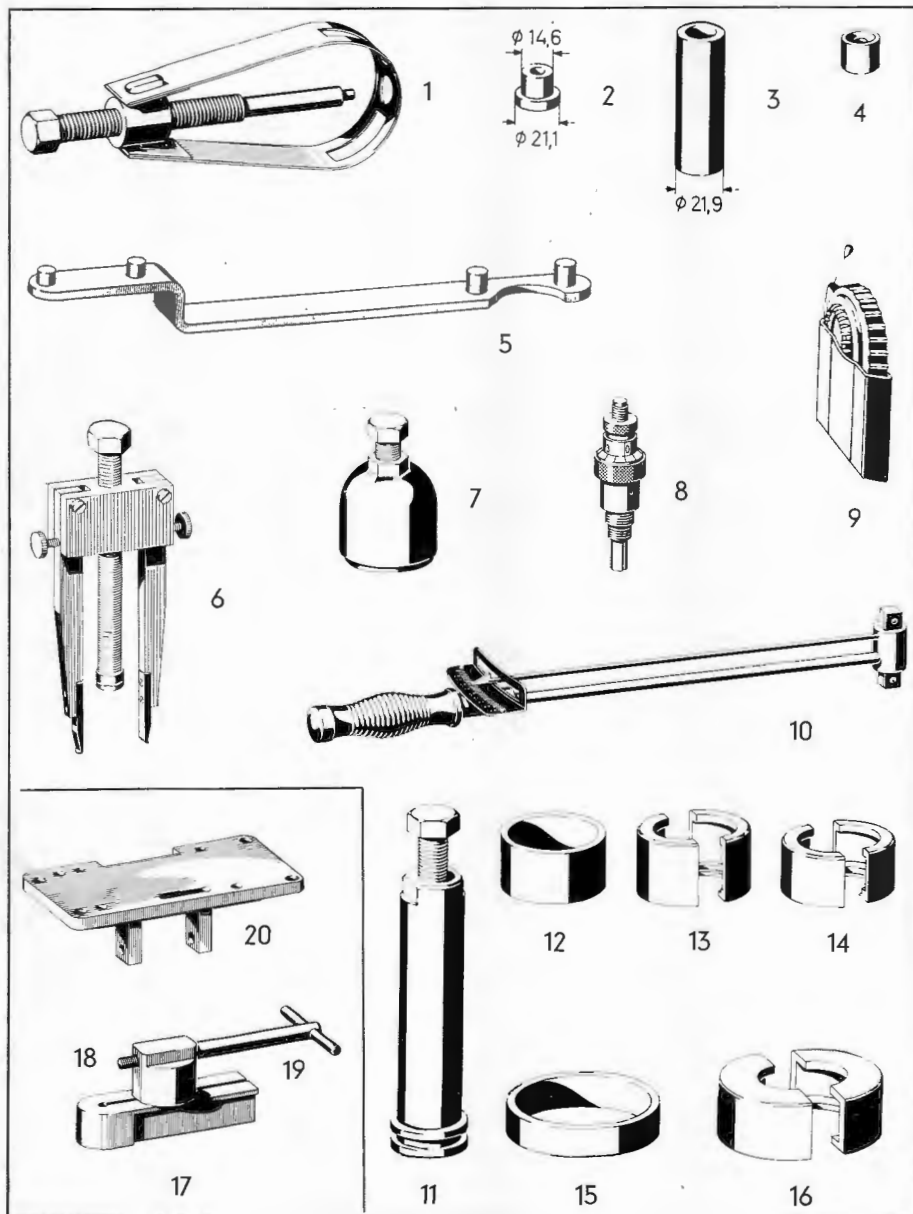
We hope that this manual will be of real practical assistance to all our dealers, agents and associates.

FICHTEL & SACHS AG
SCHWEINFURT
Service Dept.

Technical Data

Description:	SACHS SA 340	SACHS SA 340 SS (super sport)	SACHS SA 370
Type:	Fan-cooled single-cylinder two-stroke gasoline engine		
Direction of rotation:	Anti-clockwise as seen on the output shaft of the engine		
Swept capacity:	336 cc (20.503 cu in.)		368 cc (22.455 cu in.)
Bore:	φ 75.5 mm (2.972 in.)		φ 79 mm (3.110 in.)
Stroke:	75 mm (2.779 in.)		
Compression ratio:	9	11	9.7
Output:	22 HP (DIN) at 5250 rpm	26 HP (DIN) at 6000 rpm	23.5 HP (DIN) at 5250 rpm with carburettor HR-18 A 24.5 HP (DIN) at 5250 rpm with carburettor HD-13 A
Ignition:	BOSCH flywheel magneto 12 V 40 W or 12 V 75 W		
Ignition timing:	stopped engine: 0.2...0.4 mm before TDC (0.0079...0.0157 in.) running engine: 4.1...4.7 mm before TDC (0.1968...0.2283 in.)		
Contact breaker gap:	0.4 ± 0.05 mm (0.016 ± 0.002 in.)		
Pole shoe gap:	12 V 40 W equipment: stopped engine 32...36 mm (1.2598...1.4173 in.) running engine 14...18 mm (0.5511...0.7087 in.) 12 V 75 W equipment: stopped engine 25...29 mm (0.9842...1.1417 in.) running engine 7...11 mm (0.2756...0.4331 in.)		
Spark plug:	BOSCH M 240 T 1	BOSCH M 260 T 1	BOSCH M 240 T 1
Carburettor:	TILLOTSON diaphragm carburettor HD-13 A 1½" (38.10 mm dia.) HR-18 A 1¾" (30.16 mm dia.)		
Carburettor setting:	Main jet = 1 turn open Idling jet = 1 turn open	Main jet = 1¼ turn open Idling jet = 1 turn open	
Air cleaner:	Intake silencer		
Exhaust muffler:	Swirl-type exhaust silencer		
Method of starting:	Recoil starter on request solenoid-controlled starter 12 V - 0.4 HP, or inertia-pinion type starter 12 V - 0.4 HP, necessary battery 12 Volt 32...38 Ah		
Engine lubrication:	Two-stroke mixture mixed 25 : 1 ratio		

REPAIR TOOLS AND ASSEMBLY JIG



F&S 4071:22/2

Illustr. No.	Part number	Description	for engine		
			SA 340	SA 340 SS	SA 370
		Repair tools			
1	0276 065 101	Gudgeon pin extractor	x	x	x
2	1447 020 000.8	Insert for gudgeon pin extractor . . .	x	x	x
3	1449 011 000.8	Locating pin for piston	x	x	x
4	0976 088 100	Protective cap, 14 mm dia. bore . . .	x	x	x
5	0976 111 100	Retaining lever	x	x	x
6	0276 161 101	Oil seal extractor	x	x	x
	0276 164 102	Extractor hook 4 mm (1 piece)	x	x	x
	1476 012 000.8	Thrust bearing assy., spare part for 0276 161 101	x	x	x
7	0977 063 105	Extractor for magneto flywheel M 50x1	x	x	x
8	0276 135 000	Timing gauge for spark advance . . .	x	x	x
9	1376 020 000.8	Revolution counter	x	x	x
10	0276 170 000	Torque key	x	x	x
11	1476 013 000.8	Extractor sleeve assy., consisting of: 1476 011 000.8 extractor sleeve 1440 027 001.8 hexagon head bolt 1476 012 000.8 thrust bearing assy.	x	x	x
12	1447 009 000.8	Clamping ring, I. D. 58 mm	x	x	x
13	1476 014 024.8	Extractor shells for inner races of roller bearings NJ 306 C3 NA . .	x	x	x
14	1476 014 000.8	Extractor shells for bearing bushing (recoil starter)	x	x	x
15	1447 009 001.8	Clamping ring, I. D. 85.5 mm	x	x	x
16	1476 014 023.8	Extractor shells for grooved ball bearing 6306 C3	x	x	x
		Assembly jig			
17	0276 081 000	Clamping base	x	x	x
18	0276 082 000	Swivel unit	x	x	x
19	0276 085 005	Setscrew	x	x	x
20	0977 041 000	Mounting plate	x	x	x

TAKING DOWN THE ENGINE

Remove all connections from engine to frame and unit (cables, electric connections etc.).

Unscrew deflector on cylinder on SACHS SA 340 and SA 370, if there is one.

Unscrew exhaust muffler, i. e. manifold and bracket.

Remove the engine and clean thoroughly before taking down.

When giving the engine a general overhaul, components should be removed in the sequence indicated.

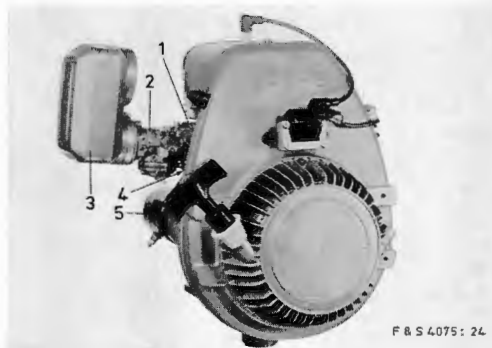


Fig. 1

Exhaust muffler, carburettor and electric starter

Fig. 1

Screw down engine on the assembly jig with 3 hexagon head bolts M 10-x 40, as shown in the adjoining illustration.

Pull off impulse pipe (4).

Remove intake silencer (3) and carburettor (2).

Remove insulating sleeves and insulating flange.

Remove flange (1) only if necessary.

Unscrew electric starter (5).

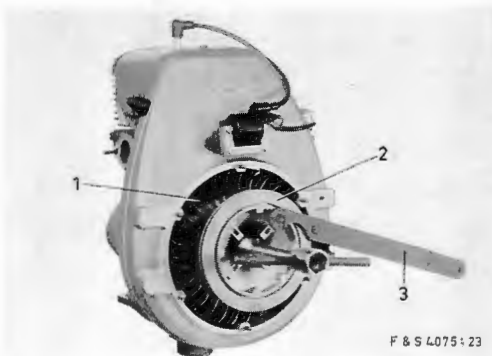


Fig. 2

Recoil starter, starter hub and fan

Fig. 2

Detach recoil starter.

Unlock nut in the starter hub (2).

Hold starter hub with retaining lever (3, repair tool no. 5), unscrew the nut and remove starter hub with spring ring and washer.

Remove 2 cylindrical pins and spacer.

Unscrew fan (1) and remove gasket.

Cover plate and fan housing

Fig. 3

Unscrew fixing clip for ignition lead (only with 40 W equipment) and cover (1).

Detach leads at terminals 1, 2 and 3 of the terminal box (6) and remove fan housing (3).

Note:

Remove cover flanges on fan housing for electric starter connection, if fitted.

When removing the fan housing, pull the insulating hose (5) with lead through.

Take care of dowel tubes.

Note:

Remove short-circuiting button only if necessary.

Remove rubber cap (2) and short-circuiting button.

Detach short-circuiting lead from insulator.

Remount parts in reverse order.

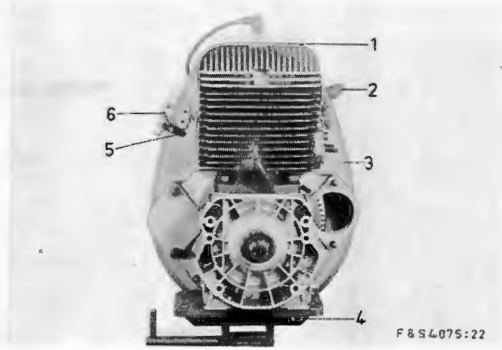


Fig. 3

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Magneto flywheel

Fig. 4

Fit protective cap (repair tool no. 4) to threaded end of crankshaft.

Fit retaining lever (1, repair tool no. 5) to magneto flywheel and pull off the flywheel by means of the extractor (2, repair tool no. 7).

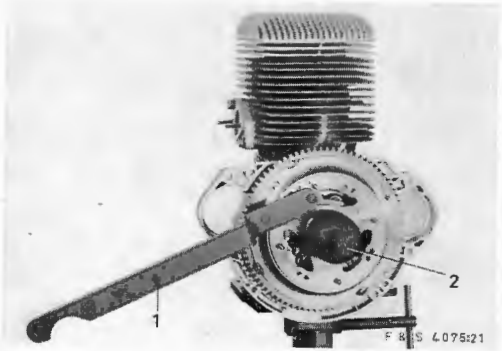


Fig. 4

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Labyrinth ring and armature base plate

Fig. 5

Unscrew labyrinth ring (5).

On engine with 40 W equipment, pull ignition lead with spring out of the spark plug terminal (6), pull off rubber sleeve (1) and rubber cap (2) and screw out the ignition lead socket.

Unscrew armature base plate (4) and remove it together with ignition lead (only with 40 W equipment) and insulating tube (with lead).

Remove Woodruff key.

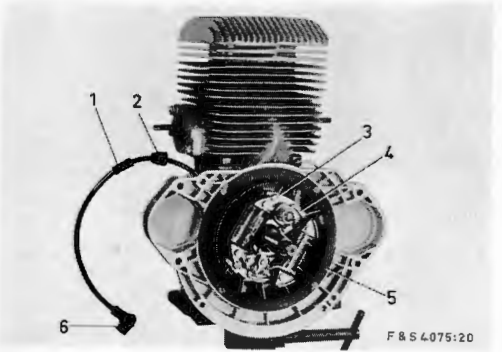


Fig. 5

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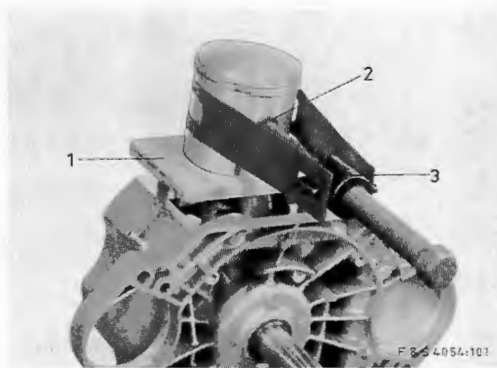


Fig. 6

Cylinder head, cylinder and piston

Fig. 6

Unscrew cylinder head and cylinder.

On SACHS SA 340 SS, remove cylinder head gasket.

Pull off cylinder without twisting. (Danger of breaking piston rings.)

Remove cylinder flange gasket.

Note:

The cylinder can be rebored twice. Use appropriate piston (see Spare Parts List).

A cylinder with chromium-plated piston bearing surface cannot be rebored.

Place cylinder on home-made slotted wooden board (1).

Cover the crankcase, take out the two wire circlips. If necessary, force out gudgeon pin with gudgeon pin extractor (3, repair tool no. 1) and insert (2, repair tool no. 2).

When fitting the steel band, care should be taken to ensure that the piston rings are in their grooves. (Danger of breaking piston rings.)

Remove slotted wooden board.

Crankcase and crankshaft

Fig. 7

Unscrew 6 hexagon socket head screws from crankcase.

Unscrew hexagon head bolt (4, Fig. 3) and split crankcase by tapping the crankcase half power takeoff side slightly with a rubber hammer.

Remove crankcase half power takeoff side and gasket. Take care of dowel tubes.

Unscrew screwed nipple (1) and oil drain cock (2).

Unscrew crankcase half magneto side from the assembly jig and heat it to 100...150 °C (212...302 °F) for removing the crankshaft (grooved ball bearing).

Clean all parts thoroughly, check for wear and replace when necessary.

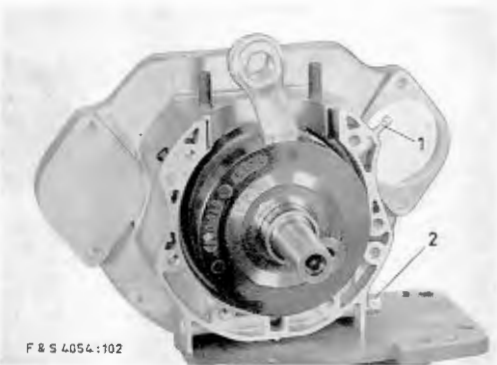


Fig. 7

Use only genuine SACHS spares.

WORK ON INDIVIDUAL PARTS

SACHS special extracting tool for crankshaft oil seals (without dismantling the engine)

FICHTEL & SACHS AG have developed a special extracting tool by means of which damaged oil seals can be replaced without a major disassembly of the engine being necessary.

Engine troubles caused by leaking or damaged oil seals can thus be remedied in a relatively short time.

When replacing oil seals, the following points should be borne in mind:

Extracting oil seals

Fig. 8

Before extracting the oil seal be sure to record installation dimension x , o or y , in order that the new oil seal can be fitted to the same dimension.

Note:

If the correct installation dimension is not adhered to, engine troubles may occur by closed oil bores in the crankcase or by rotating parts moving against other parts.

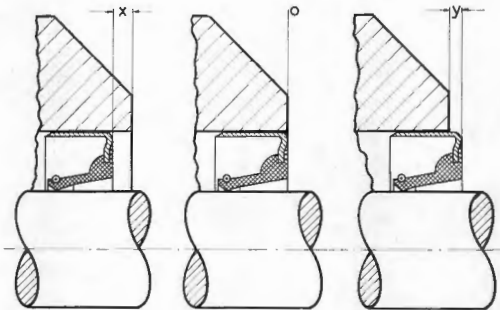


Fig. 8

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Fig. 9

If the oil seal is locked towards outside by means of a collar (a) or other locking element, it cannot be extracted.

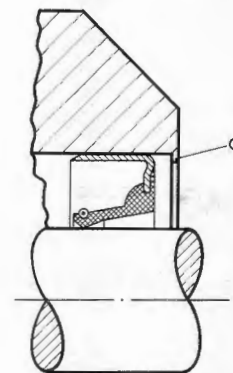


Fig. 9

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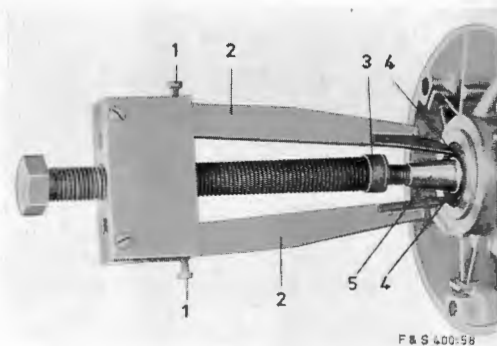


Fig. 10

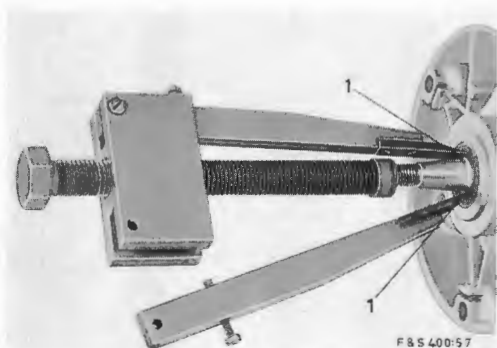


Fig. 11

Fitting the oil seal



Fig. 12

Fig. 10

Place the extracting tool in position in such a way that the two hooks (4) grip behind the sheet steel rim of the oil seal. Pre-tension the two legs (2) evenly with cylinder head screws (1), taking care that shaft (5) and thrust screw (3) are in alignment.

Screw in thrust screw and extract oil seal.

Fig. 11

If the gap between shaft and sheet steel rim of oil seal is too narrow and the extracting tool cannot completely be placed in position, take off one leg of the extracting tool and insert both hooks (1) in inclined position.

Remount leg and extract oil seal as described under Fig. 10.

Note:

If the oil seal has got stuck (oxidation), the sheet steel rim may break. Therefore it is advisable to knock the oil seal out of its force fit by means of a tube.

Fig. 12

Before fitting the oil seal, fill the space around the tension spring with a little heat-resisting grease and lightly smear the sealing lip.

To protect the sealing lip of the oil seal from damage caused by sharp edges on the shaft, use shell sleeve. If necessary, put smooth adhesive tape around sharp edges.

Place oil seal in position and press it in by means of a suitable tube, taking care of exact installation dimension x, o and y (Fig. 8).

The oil seal must not be tilted when being pressed in.

Changing crankshaft bearings

Heat crankcase halves to about 100...150 ° C (212...302 ° F). Remove outer races of bearings and crankshaft oil seals.

Insert new outer races of roller bearings into the warm crankcase halves until they strike a stop. Press in oil seals (with sealing lips inwards) until they are flush.

Press in new grooved ball bearings into the warm crankcase halves on the magneto side until they strike a stop. Press in crankshaft oil seals until flush only after the crankcase halves have been screwed together.

Removal of inner races of roller bearings and grooved ball bearing

Fig. 13

Pull off inner race (1) and grooved ball bearing (4) by means of the appropriate extractor shells (9 and 6), clamping rings (8 and 7) and withdrawal tool (10, repair tool no. 11 to 16).

Remove spacers (3) and compensating washers (2).

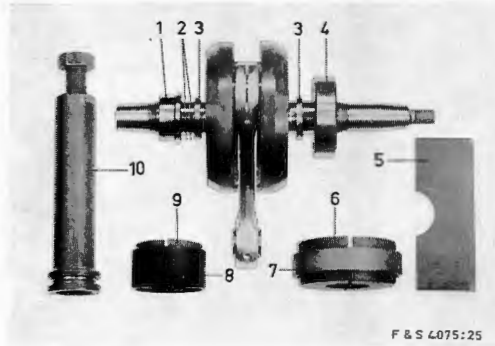


Fig. 13

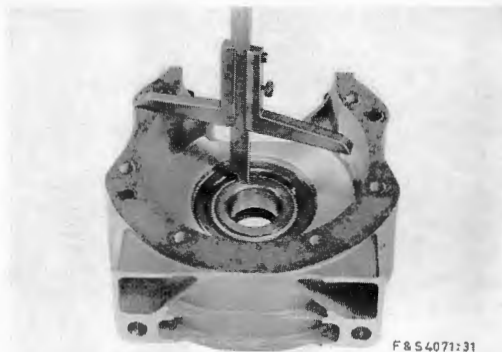


Fig. 14

Gauging axial play of crankshaft

Fig. 14

Permissible axial play 0.1...0.2 mm (0.0039...0.0079 in.).

Example:

Insert inner race of cylindrical roller bearing into outer race.

Crankcase power takeoff side: sealing surface (with gasket) to inner race of bearing 40.60 mm

Crankcase magneto side: sealing surface to inner race of bearing + 39.50 mm

Crankcase gap 80.10 mm

Dimension of crankshaft, measured over both crank webs, with a 5 mm thick spacer on power takeoff and magneto side - 79.00 mm

Axial play 1.10 mm

Permissible axial play - 0.20 mm

Difference to be taken up 0.90 mm

The difference of 0.90 mm is taken up by inserting shims (2, Fig. 13) between the spacer (3, Fig. 13) and the inner race of the cylindrical roller bearing (1, Fig. 13) on the crankpin power takeoff side.

Fitting the inner race of the cylindrical roller bearing

When fitting the inner race of the cylindrical roller bearing (do not forget spacers 3, Fig. 13 on crankpin power takeoff side), an intermediate plate (5, Fig. 13) should always be positioned between the two crank webs. This plate must be of such a size that it can be supported at both ends, thereby permitting the crankshaft to lie freely in position.

Never clamp the crankshaft in a vice at a crankpin or at the webs and never try to fit the inner race by striking it. This will crush the webs and render the crankshaft unserviceable.

Recoil starter

The recoil starter is available for clockwise or anti-clockwise starting direction. It can also be subsequently converted for the other starting direction. The illustration below shows the two starting directions.

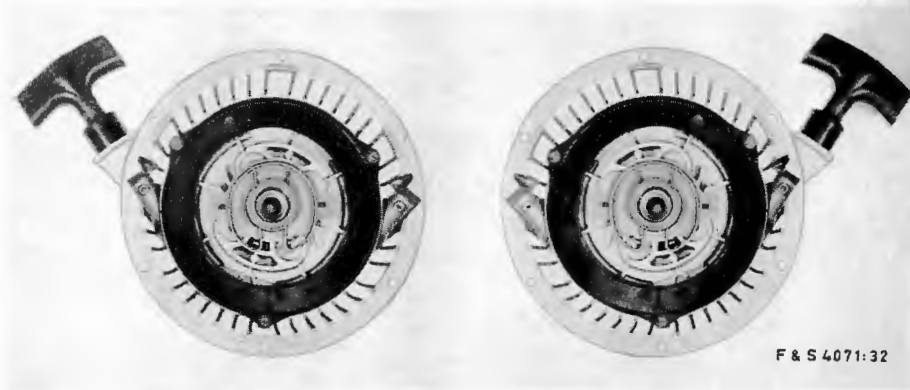


Fig. 15

Recoil starter for engine running in clockwise direction

Recoil starter for engine running in anti-clockwise direction

(as seen on the power take-off side of the crankshaft)

Dismantling

Fig. 16

Take out brake spring (5), shims, spring ring, friction plate (3), washer 0.1 mm (0.0039 in.) thick and starter pawls (1 and 4). Screw off labyrinth ring (2).

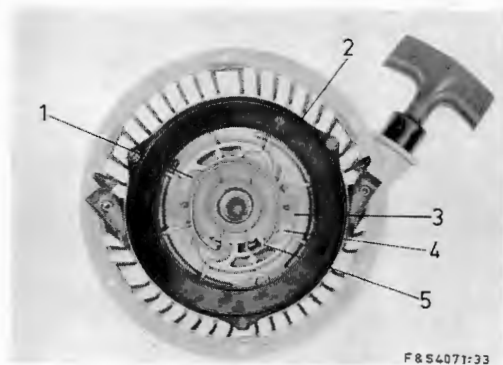


Fig. 16

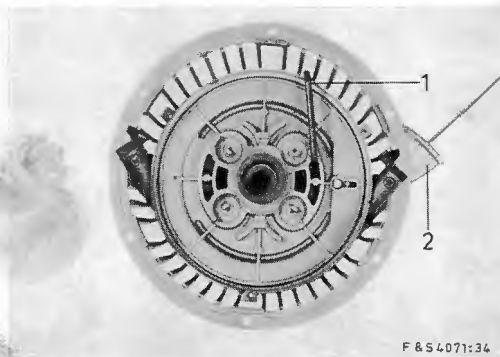


Fig. 17

Fig. 17

Pull out starter cord approx. 50 cm (19 in.) and hold pulley with home-made retaining clip (1).

Take clamping ring with clamping taper out of starter handle. Withdraw clamping taper from clamping ring and detach cord.

Remove clamping ring and starter handle with stop from cord.

Remove retaining clip (1) and let starter cord run back completely.

Carefully take out pulley with oil spring, taking care not to let coil spring jump out.

Take care of disc (3, Fig. 19).

Remove cord from pulley.

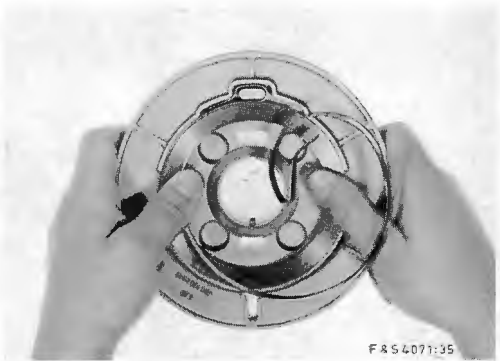


Fig. 18

Fig. 18

Raise spring end to take out coil spring.

Hold coil spring firmly with both thumbs (see illustration) and, by raising each thumb, let out spring on alternate sides.

Note:

Replace bush (2, Fig. 20) only if necessary, using the extractor shells (repair tool no. 14).

Take care of tolerance ring in bush (2, Fig. 20).

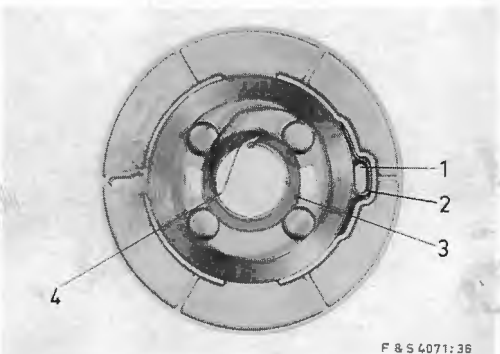


Fig. 19

Assembly

Fig. 19

Before assembling, grease coil spring with Aero-SHELL grease 14 and fill the 4 lubricating grooves in the pulley with the same lubricant.

Insert coil spring with end of spring (2) in stud (1) and fit in coil by coil.

Ensure that the coil spring lies flat and even.

Note:

For clockwise starting direction, insert coil spring as shown in illustration, for anti-clockwise direction insert coil spring reversely.

Fig. 20
Before inserting pulley, stick disc (3, Fig. 19) 0.8 mm thick (0.032 in.) with a little grease into recess of pulley.

Fit pulley on to bearing bolt and insert end of spring (4, Fig. 19) at stud (1).

Tension pulley/coil spring in direction of cord exit until stop is encountered.

Release coil spring approx. $\frac{1}{2}$...1 turn until the recess for the soldering nipple in the pulley rests near the cord duct of the housing.

Again hold the pulley firmly with home-made retaining clip (1, Fig. 21).

Pull the starter cord through a rag soaked with SAE-10 oil before assembling.

Fig. 21

Note:

When converting starting direction, reposition cord guide (2) also.

Fit starter handle with stop and clamping ring on to cord.

Lay starter cord around clamping taper and pull it into clamping ring.

Pull clamping ring into starter handle and let starter cord run back.

Fig. 22

Screw labyrinth ring (2) tight.

Lubricate starter pawl bed and starter pawls lightly with SAE-10 oil.

Fit starter pawls (1 and 4).

The open side of the starter pawl seating and the long side of the starter pawl face in starting direction.

Fit washer 0.1 mm (0.0039 in.) thick, friction plate (3), spring ring and shims as required.

Insert brake spring (5).

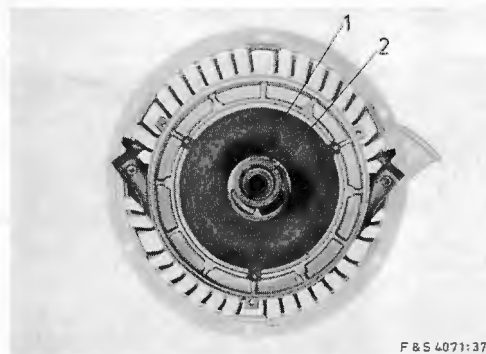


Fig. 20

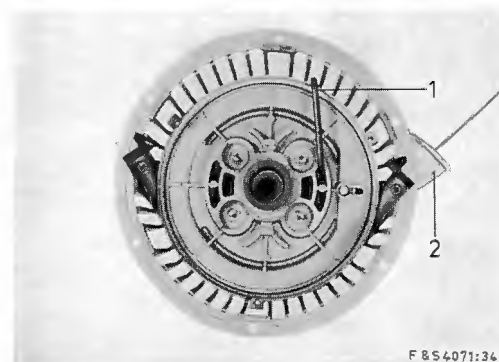


Fig. 21

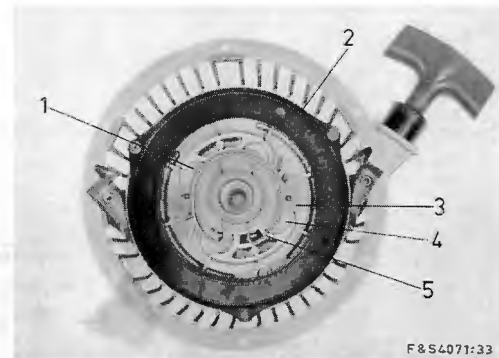


Fig. 22

After mounting the brake spring, the friction plate should have an axial play of 0.1...0.2 mm (0.0039...0.0079 in.).

Correct this play by putting shims under the brake spring.

Replacing the magneto housing or the flywheel

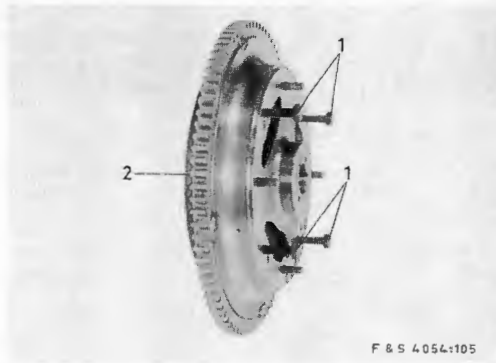


Fig. 24

Fig. 24

Screw out 4 recessed head screws in flywheel.

Screw in 4 hexagon head screws (1) from other side (with equipments without gear ring for electric starter the 4 staybolts must be removed before) and press out flywheel (2).

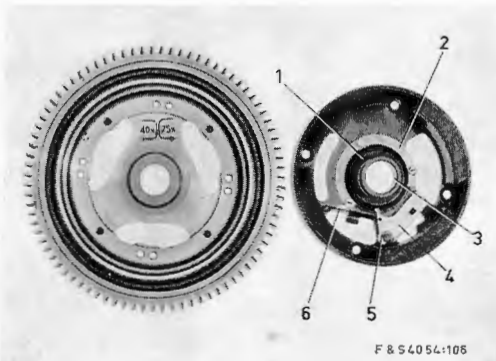


Fig. 25

Fig. 25

Unscrew retaining strip (2) and take out cam (1).

Fill annular groove (3) with heat-resisting grease and grease cam support in flywheel.

Insert cam (1), fit retaining strip (2) and screw tight with 3 cylinder head screws M 4 x 5 and washers.

Take retaining ring (5), flyweight (4) and thrust ring below off bearing pin.

Grease bearing pin and bearing surface for flyweight in flywheel with heat-resisting grease.

Fit thrust washer (0.3 mm thick) on bearing pin, hang spring (6) into place in flyweight.

Fit flyweight on bearing pin (must engage with cam) and secure with retaining ring (5).

Cam and flyweight must always be free-moving.

Note:

On equipments with gear ring for electric starter there are two markings in the magneto housing: "40x" (for 40 W equipment) and "75x" (for 75 W equipment).

The flywheel should be fitted in such a way that the bores in the flywheel are perfectly in line with the bores in the housing.

On engine without electric starter, fit appropriate magneto housing (see Spare Parts List) according to equipment (40 or 75 W) in such a way that the bores in the housing are perfectly in line with the bores in the flywheel.

Press in flywheel.

Degrease 4 Philips screws M 6 x 10 with Tri, apply LOCTITE to them and screw them in. Tightening torque 0.9...1.1 kpm (6.5...7.9 ft. lb.).

Carburettor

The type of carburettor, the jet size and the jet adjustment are determined by means of tests in the factory. The adjustment determined in this way gives the best results, and it is therefore not advisable to alter it.

No alteration of the carburettor setting should be made as long as the engine turns over quietly and smoothly when idling, accelerates steadily when the throttle is opened, and gives its full output at full revs without choking. If the engine pounds or runs unevenly, or the exhaust gas is black, the mixture is too rich. Repeated spitting or coughing, or backfiring with a blue flame stabbing from the carburettor coupled with difficult starting, indicates that the mixture is too weak.

When running with the correct carburettor adjustment, a clean air filter and a suitable sparking plug with the correct thermal value, the insulator of the sparking plug should be brown in colour. Sooty or wet plugs indicate rich mixture, whereas white insulator points to the mixture being too weak.

Special care should be taken to ensure that the carburettor setting is never too low, as at low throttle insufficient lubricant will be conveyed to the moving parts of the engine. With a two-stroke engine the carburettor setting should always be sufficient to provide adequate lubrication.

Correct carburettor setting will help to ensure economic and trouble-free running of the engine.

Adjusting the carburettor for special climatic conditions

When using the engine at altitudes above 1000 metres (3280 ft.), adjustments of the carburettor setting will be required. As the air density is reduced at high altitudes, the supply of gasoline to the carburettor should be restricted by changing the main jet.

Starting

On Tillotson diaphragm carburettors the choke is incorporated in the carburettor itself.

The choke should be used to facilitate starting from cold. It should not be used for starting when the engine is warm and it should be partially or fully closed only for starting the cold engine.

When the choke is closed, a higher vacuum is caused in the mixing chamber, so that a richer fuel/air mixture is obtained. Once the engine has started, the choke should be slowly opened.

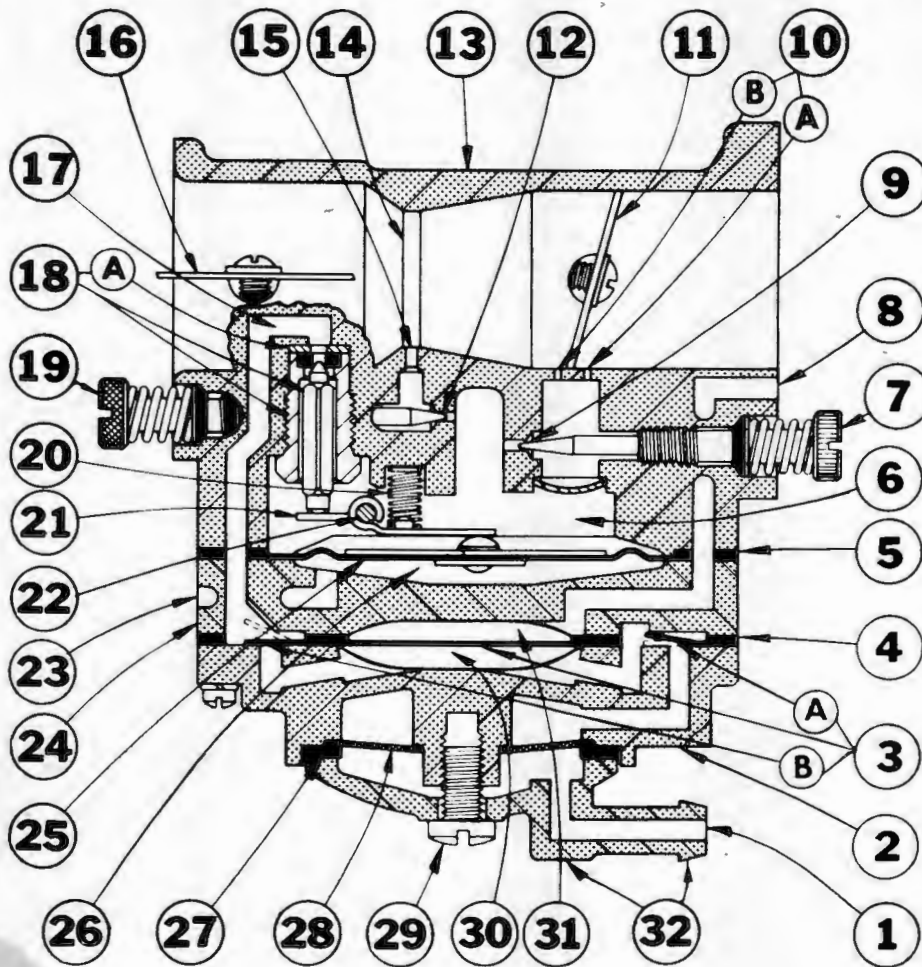
The Tillotson diaphragm carburettor can function in any position. The HR-8 A type and the HR-18 A type have two diaphragms, the HD-7 A type and the HD-13 A type have three diaphragms: a control diaphragm for proportioning the fuel feed to the engine and a pump diaphragm (HD-7 A and HD-13 A have two pump diaphragms) for drawing the fuel from the tank.

Carburettor adjustment

The Tillotson carburettor is the first carburettor used for SACHS engines which has adjustable jets. If engine troubles occur and the jets have to be readjusted, the following points should be noted:

1. To adjust the carburettor correctly for maximum output (full load), the engine should be thoroughly warmed up.
2. With adjustable jets, care should be taken not to use too lean a fuel/air mixture (see also page 28).
3. The adjusting screws for the jets must never be screwed too tightly to the right (i. e. closed) in the jet seat, as this will deform the seat.
4. The main jet is marked "H" and the idling jet is marked "L" on the carburettor housing.

Tillotson diaphragm carburettor



F65 430-152

Fig. 26

- | | | |
|-----------------------------------|--|-----------------------------|
| 1 Hose nipple | 10A Idling outlet passage | 20 Inlet compression spring |
| 2 Fuel pump body | 10B By-pass passage | 21 Inlet control lever |
| 3 Fuel pump diaphragm | 11 Butterfly valve | 22 Pivot pin |
| 3A Inlet valve on pump diaphragm | 12 Main jet orifice | 23 Vent hole |
| 3B Outlet valve on pump diaphragm | 13 Carburettor housing | 24 Diaphragm housing |
| 4 Fuel pump gasket | 14 Throat of carburettor (venturi) | 25 Diaphragm |
| 5 Diaphragm housing gasket | 15 Main fuel outlet | 26 Air chamber |
| 6 Control chamber | 16 Choke | 27 Filter gasket |
| 7 Adjusting screw for idling jet | 17 Fuel passage from pump to control chamber | 28 Fuel strainer |
| 8 Impulse passage | 18 Inlet needle and seat | 29 Filter housing screw |
| 9 Idling jet orifice | 18A Copper seal | 30 Fuel chamber |
| | 19 Adjusting screw for main jet | 31 Pulsation chamber |
| | | 32 Fuel filter housing |

Initial adjustment

Jet adjustment should first be done when the engine is cold. Proceed as follows: Close both jets and open the adjusting screw of the main jet and the adjusting screw of the idling jet again to the values given in the carburettor chart (see technical data). Turn the idling adjustment screw so far back that it is no longer in contact with the butterfly valve lever; then turn the screw in again about one whole turn, so that the butterfly valve is slightly open.

Now start the engine and allow it to warm up (open the choke as soon as the engine starts up).

Final adjustment: see section "Test-running the engine".

Maintenance of the carburettor

At certain intervals every carburettor must be disassembled, cleaned and overhauled. All exterior dirt should be cleaned off with gasoline before disassembly. The holes, ducts, passages and jets must not be cleaned with hard objects (e. g. wire or drill), but should only be rinsed with gasoline and cleaned with compressed air (remove diaphragms before blowing through). Before assembly, check that all carburettor components (especially jet seats and diaphragms) are in proper working order.

Checking and cleaning the fuel filter in good time helps to achieve satisfactory functioning of the carburettor and longer engine service life.

Special maintenance instructions

1. If pump failure occurs, always check (before removing the pump diaphragm) the impulse pipeline for leakage and blockage.
2. When fitting the inlet control lever and the compression spring (see illustration), take care that both ends of the spring are bedded in the spring seats.
3. The compression spring must not be stretched, as the spring pressure is accurately adjusted to the carburettor.
4. The inlet control lever is correctly inserted when it is at the same level as the bottom of the diaphragm chamber (see arrow on illustration).
5. The inlet needle should close just when the inlet control lever is flush with the bottom of the chamber. If not, the lever should be adjusted by bending it a little (on the inlet needle side).
6. When assembling the carburettor, make sure that main diaphragm, gasket and casting of the housing are carefully inserted into the cast-on centering pins; similarly, the gasket, fuel diaphragm and fuel pump body are adjusted by means of the same kind of centering pins.

The gaskets at both diaphragms are in each case positioned on that side of the diaphragm which faces the carburettor housing.

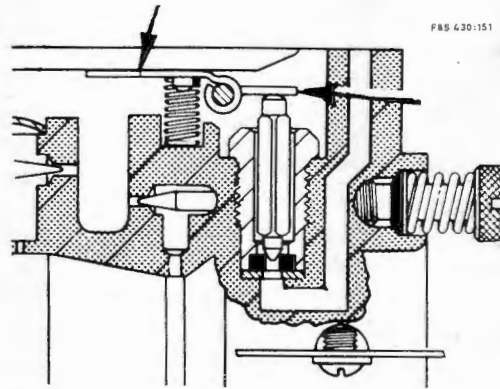


Fig. 27

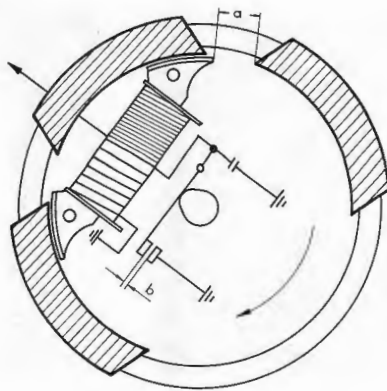


Fig. 32
12 V 40 W equipment

F & S 4071:20

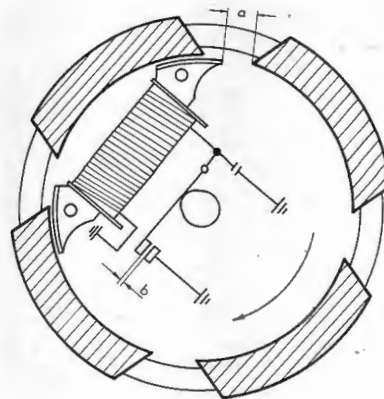


Fig. 33
12 V 75 W equipment
(with external ignition coil)

F & S 4071:21

Should the pole shoe gap be incorrect, it can be corrected by slightly adjusting the breaker contacts in the range of 0.4 ± 0.05 mm (0.016 ± 0.002 in.).

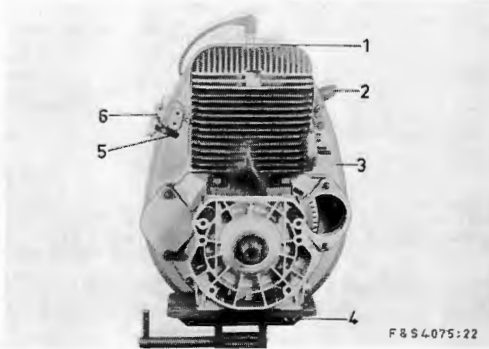


Fig. 34

F & S 4075:22

Fan housing and cover

Fig. 34

Insert the two dowel tubes into the housing and fit the fan housing.

Pass insulating tube (5) with lead from inside through the bore in the housing.

Connect lead to screw terminal as follows:

Connect lighting lead (yellow) to terminal 1 and 2.

Connect short-circuiting lead (black) from short-circuiting button and from dynamo magneto to terminal 3.

Note:

With the 12 V 75 W equipment, connect primary lead (blue) from dynamo magneto and short-circuiting lead from short-circuiting button to terminal 3.

Connect earth wire (brown) with right-hand carburettor from cover or baffle plate respectively, with left-hand carburettor from support of Bowden cable, to terminal 4.

Screw fan housing tight with 4 nuts M 8, 2 nuts M 6 and spring washers.

Note:

Fit also cover flange for electric starter connection, if there is one.

Secure cover (1, Fig. 34), ignition lead with rubber sleeve (1, Fig. 5) and fixing clip (only with 40 W equipment) and earth wire (only with right-hand carburettor) with 3 fillister head screws M 6 x 10 and spring washers. (If on SACHS SA 340 and SA 370 there is a baffle plate, do not yet secure cover on exhaust side.)

Fan, starter hub and recoil starter

Place fan (1, Fig. 2) with gasket in position and secure it with 4 nuts M 6 and spring washers.

Torque 0.5...0.6 kpm (3.6...4.3 ft. lb.).

Insert two cylindrical pins 4 dia. x 15 and fit spacer.

Place starter hub (2, Fig. 2) in position and fit washer and tab washer. Hold it with retaining lever (3, Fig. 2) and secure starter hub with hexagon nut (with collar) M 14 x 1.5.

Torque 9.0...9.5 kpm (65.1...68.7 ft. lb.).

Secure recoil starter with 6 nuts M 6 and spring washers.

Electric starter, carburettor and intake silencer

Screw on electric starter with two nuts M 8 and spring washers.

Connect impulse pipe (4, Fig. 1) to connection on crankcase.

Place on both insulating bushes, insulating flange, carburettor and both fibre washers (hard cloth side towards carburettor) and screw carburettor firmly into place on the flange (1, Fig. 1) with 2 self-locking nuts M 6 (for carburettor HR 18 A) and M 8 (for carburettor HD 13 A) respectively.

Fit intake silencer (3, Fig. 1) and secure it.

Exhaust muffler and baffle plate

Screw on exhaust muffler or manifold and bracket respectively.

If there is a baffle plate on SACHS SA 340 and SA 370, screw tight exhaust muffler or manifold respectively on the right-hand stud screw with a nut M 8 x 22.5. Screw baffle plate with 1 cylinder head screw M 8 x 12.5 to nut and 1 cylinder head screw M 6 x 10 with earth lead (in case of right-hand carburettor) and cover to fan shroud.

TEST-RUNNING AND RUNNING-IN THE ENGINE

Test-running

Start the engine and let it warm up (open the choke as soon as the engine starts up).

Final adjustment

Adjust the desired idling speed of the engine by means of the idling adjustment screw. Then slowly vary the setting of the adjusting screw of the idling jet so that the engine speed increases smoothly when the throttle is opened. The main jet is correctly adjusted when the engine gives satisfactory two-stroke operation under load and only slight fumes are discharged from the exhaust. If there is excessive exhaust smoke under load, turn main jet adjusting screw clockwise (closing) until smoking stops and engine runs satisfactorily.

If the idling speed fluctuates too much or is too high, turn the idling jet adjusting screw anti-clockwise (to open the jet) until the engine runs smoothly at lower speed without beginning to discharge more smoke from the exhaust.

Running-in period

Even the finely machined surfaces of pistons and cylinders are not so smooth as the surfaces of parts which have been sliding against one another for some time. For this reason every piston requires to be run in during the initial period of operation. This does not call for any special precautions, however, but simply means that the engine should not be required to give its maximum output during the first 20...30 running hours.

No special gasoline/oil mixture is required during the running-in period, and consequently there is no need to add any special oils.

ENGINE WITH BOSCH SOLENOID-CONTROLLED STARTER (Type DD)

Fig. 35

To remove starter, unscrew 2 nuts
(1) M 8 with spring washers.

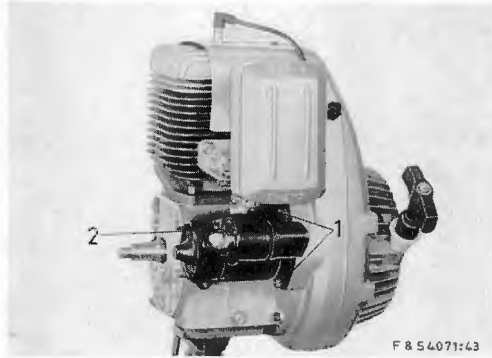


Fig. 35

The pinion of the solenoid-controlled starter (Fig. 35) slides on a coarse thread on the armature shaft and is first pressed up against the gear rim by means of a shift lever until it engages with it. The lever is electro-magnetically operated. Shortly after engagement of the pinion, the switch mounted on the starter automatically closes – on mechanically operated starters by means of the engaging lever – the armature revolves and the pinion screws itself further forward on the coarse thread until it is fully engaged. Even if tooth on tooth engagement occurs, the switch will close, as the spring is spring-connected to the guide ring and the lever is therefore not hindered in its movement; when starting, the armature turns the pinion until it can engage. As soon as the pinion runs up against its counterpart, firm contact is established between it and the armature, and the engine is being started.

If, after starting, the engine begins to overtake the starter, the pinion is uncoupled from the armature shaft by an overrunning roller clutch, but remains engaged with the gear rim until the engaging lever is returned to its initial position by a return spring.

To enable the starter to come to rest as soon as possible after being switched off, and to enable a new start to be made shortly afterwards, an armature brake is installed on the commutator bearing of the starter.

ENGINE WITH BOSCH INERTIA-PINION TYPE STARTER (Type DG)

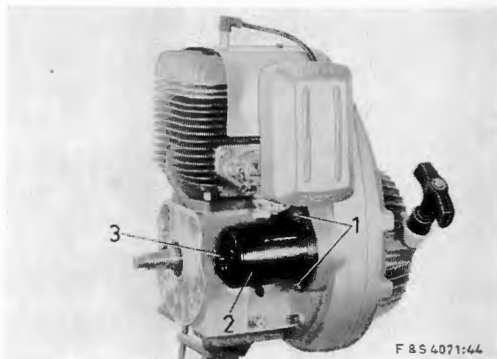


Fig. 36
To remove starter, unscrew 2 nuts
(1) M 8 with spring washers.

Fig. 36

The pinion of the inertia-pinion type starter (Fig. 36) slides on a coarse thread on the armature shaft. In rest position the gear is held back by spring tension and the pinion is not engaged. When the starter is operated, the acceleration of the starter and the inertia of the pinion result in a force which causes the pinion to run along the shaft and engage with the gear rim. When the pinion has reached the stop on the armature shaft the drive becomes positive and the engine is turned by the starter.

If, after starting, the engine begins to overtake the starter, the pinion is uncoupled from the armature shaft by an overrunning roller clutch and is spun back by spring pressure into rest position.

Note:

On subsequent installation of an inertia-pinion type starter, only the magneto housing with steel rim (F & S Part No. 1471 007 000) can be used.

Operation, maintenance and lubrication of electric starters

Operating instructions

Do not leave the starter switched on longer than 10 seconds without interruption. Before switching on again, wait 1 minute to allow the starter to cool and the battery to recover. If there is a grating of teeth, switch off starter immediately and repeat starting attempt. Let go the starter as soon as the engine runs under its own power.

Should the system not be provided with a starter safety device, never switch on the starter until the engine or the pinion have come to rest, as otherwise damage will be caused to pinion and gear rim.

If the engine does not start after some starting attempts, further starting attempts will serve no purpose and will only lead to exhaustion of the battery. The fault should be sought and remedied (check the fuel supply in particular).

Maintenance

Danger of short circuits arises when work is carried out on the electrical components of the built-in starter. It is therefore strongly recommended, before carrying out such work, that the earth lead be disconnected from the battery. Do not place tools on the battery!

Carbon brushes

The condition of the carbon brushes should be checked periodically. After removing the retaining strap (2, Fig. 35) of the solenoid-controlled starter or screwing off the cap (3, Fig. 36) and taking out the fuse, the compensating washers and the cap (2, Fig. 36) of the inertia-pinion type starter, the spring which presses the relevant carbon brush on to the commutator should be raised, preferably with a hook (take care not to bend spring to one side and not to raise it longer than necessary). Now check that the carbon brushes can easily be moved in their guides in the brush holder.

The carbon brushes and brush holders must be kept free of dust, oil and grease. If these parts are dirty or jam, they should be cleaned with a clean gasoline-damped rag (not with waste wool, as this easily sheds fibres) and well dried.

Do not sandpaper, file or use knives on the bright ground surface of the carbon brushes. Blow out the brush holders well. If a carbon brush is broken, unsoldered or so worn that the spring or the soldered-in strand in the brush is in danger of striking against the brush holder, then it should be replaced. (Use only BOSCH carbon brushes.) When fitting the carbon brushes, care should be taken that the spring does not strike against the brush.

When fitting the cover strap (2, Fig. 35) of the sliding pinion starter, care should be taken to ensure that the locking clasp lies on the middle of a web; the sealing strip glued into the strap should closely fit everywhere.

When fitting the cap (2, Fig. 36) of the inertia pinion type starter, care should be taken to ensure that the armature shaft is seated correctly in the housing and that the carbon brushes are in close contact with the commutator. Fit compensating washers and fuse and screw on cap (3, Fig. 36).

The carbon brushes should at all events be renewed when the engine is given a general overhaul.

Commutator

The commutator should have an even, grey-black surface, and must be free of dust, oil and grease. Soiled commutators should be cleaned with a clean gasoline-damped rag (not with waste wool) and well dried. Commutators which have become scored and eccentric must be re-turned in a suitably equipped workshop. By no means should a commutator be worked on with sandpaper or a file.

Lubrication

Both bearings of the starter are provided with a self-lubricating bearing (Compo-bush). These bearings must not be greased or treated with grease-dissolving cleaners. To increase their service life, the pinion and the gear rim should be cleaned periodically with a brush dipped in gasoline and then re-greased (graphite grease, e. g. BOSCH-grease Ft 1 v 13). If necessary, remove burrs from gear rim and pinion.

Starter faults

When faults arise it should be borne in mind that their cause need not necessarily lie with the starter itself, nor in the poor electrical connection of the vehicle earthing points, but also in the fuel supply. The following remedial hints are limited to the actual starter system.

A. When the ignition is switched on, the armature shaft does not rotate, or only slowly:

1. Battery exhausted.
2. Battery defective.
3. Battery terminals loose, oxidized, earth connection poor.
4. Starter brushes or terminals have ground contact.
5. Carbon brushes of the starter do not lie on the commutator, are jammed in their guides, are worn, broken, oil-smearred or soiled.
6. Starter switch damaged (parts loose, so that switch is not on, burnt out).
7. Magnetic switch of starter damaged (only with solenoid-controlled starter).
8. Loss of current in leads too great, leads damaged, lead connections loose.

B. Armature rotates, but pinion does not engage:

1. Pinion soiled.
2. Burr on pinion or gear rim.

C. When the ignition is switched on, the starter armature rotates until the pinion connects, then stops:

1. Battery insufficiently charged.
2. Pressure of carbon brushes insufficient.
3. Magnetic switch of starter (only with solenoid-controlled starter) not in order.
4. Loss of current in leads too great.

D. Starter keeps running after switch is released:

1. Starter switch does not switch off or magnetic switch (only with solenoid-controlled starter) sticks.

E. Pinion does not disengage after engine starts:

1. Pinion or flywheel toothing badly soiled or damaged; return spring weak or broken.

INSTRUCTIONS AND WIRING DIAGRAM FOR DYNAMO MAGNETO 12 V 40 W

The dynamo magneto generates alternating current with a lighting power of 40 Watt at 12 Volt.

Only one of the yellow lighting leads should be connected up (see wiring diagram). The second yellow lighting lead remains blind and may be used later for connecting up a rectifier to charge a battery.

The bulbs should be so selected that the total load of the dynamo magneto is 40 Watt, as otherwise the bulbs may fuse.

Care should be taken to ensure a good earth connection from the engine via the chassis to the lamps.

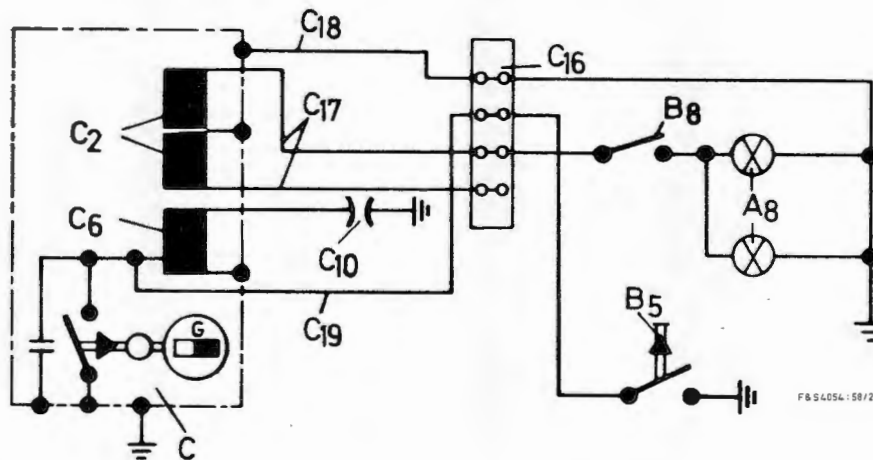


Fig. 37

A₈ = Load (12 V 40 W)
B₅ = Short-circuiting switch
B₈ = Light switch
C = Dynamo magneto
C₂ = Dynamo armature
C₆ = Ignition armature

C₁₀ = Sparking plug
C₁₆ = Terminal carrier
C₁₇ = Lighting lead (yellow)
C₁₈ = Additional earth lead (brown)
C₁₉ = Short-circuiting lead (black)

INSTRUCTIONS AND WIRING DIAGRAM FOR DYNAMO MAGNETO 12 V 75 W

The dynamo magneto generates alternating current with a lighting power of 75 Watt at 12 Volt.

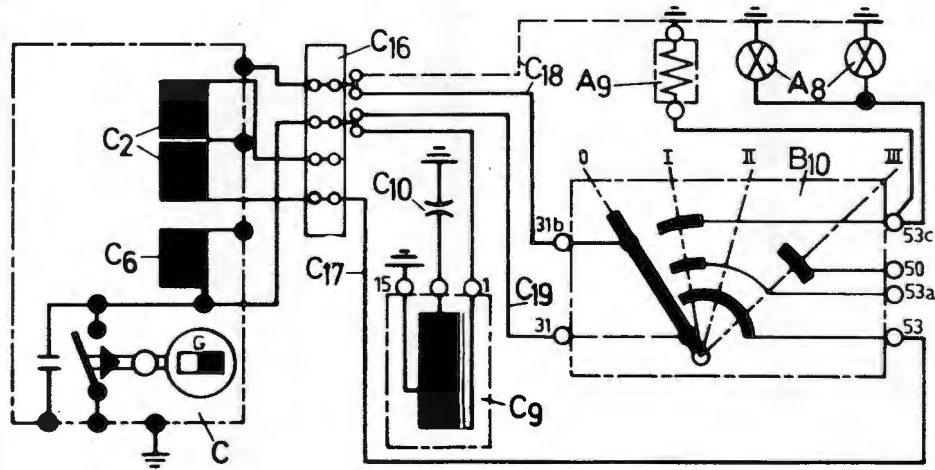
Only one of the yellow leads should be connected up (see wiring diagram).

The second yellow lighting lead remains blind and may be used later for connecting up a rectifier to charge a battery.

The bulbs should be so selected that the total load of the dynamo magneto is 50 Watt.

For reaching the 75 Watt a resistance of 25 Watt must be added.

Care should be taken to ensure a good earth connection from the engine via the chassis to the lamps.



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Fig. 38

A₈ = Load (12 V 50 W)
 A₉ = Resistance (12 V 25 W)
 B₁₀ = Ignition light switch
 C = Dynamo magneto
 C₂ = Dynamo armature
 C₆ = Ignition armature

C₉ = Ignition coil (lying outside)
 C₁₀ = Sparking plug
 C₁₆ = Terminal carrier
 C₁₇ = Lighting lead (yellow)
 C₁₈ = Additional earth lead (brown)
 C₁₉ = Short-circuiting lead (black)

Switching positions:

0 = Off (Ignition short-circuited)
 I = Night operation
 II = Day operation
 III = Intended for starting

INSTRUCTIONS AND WIRING DIAGRAM 12 V 40 W AND BOSCH SOLENOID-CONTROLLED STARTER (Type DD)

The dynamo magneto generates alternating current with a lighting power of 40 Watt at 12 Volt.

The two yellow lighting leads are to be connected up to the rectifier for charging a 12 Volt 38 (or 32) Ah battery for lighting and for operating the electric starter (see wiring diagram).

The bulbs should be so selected that they give a total load of 40 Watt.

Care should be taken to ensure proper wire cross sections for starter operation and a good earth connection between battery, chassis and lamps.

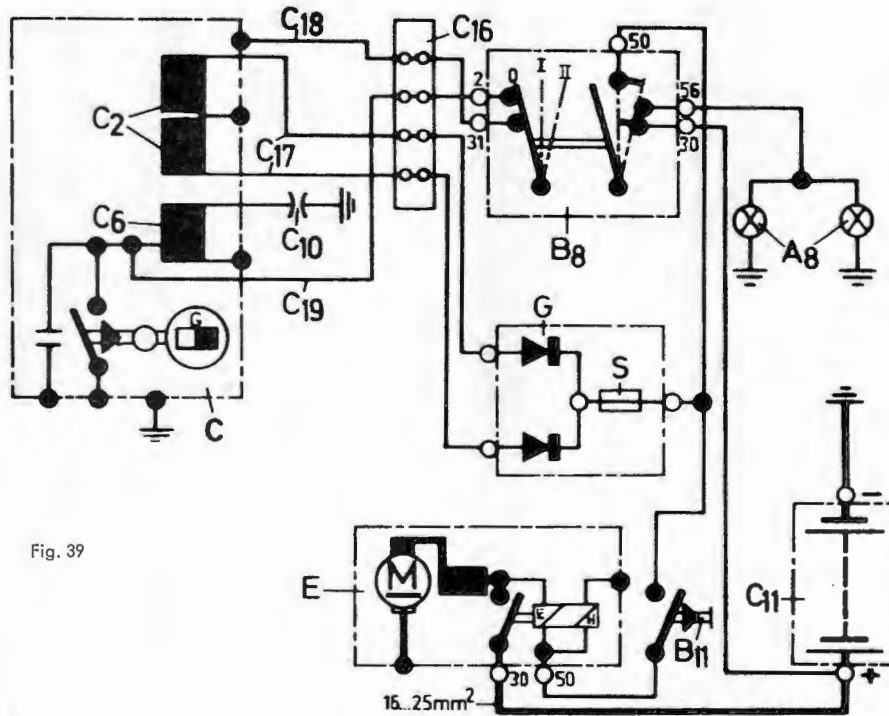


Fig. 39

A₈ = Load (12 V 40 W)
B₈ = Light switch
B₁₁ = Starter switch
C = Dynamo magneto
C₂ = Dynamo armature
C₄ = Ignition armature
C₁₀ = Sparking plug
C₁₁ = Battery

C₁₆ = Terminal carrier
C₁₇ = Lighting lead (yellow)
C₁₈ = Additional earth lead (brown)
C₁₉ = Short-circuiting lead (black)

E = Electric starter
G = Rectifier
S = Fuse (4 Amps)

Switching positions:

0 = Off (Ignition short-circuited)
I = Start (by means of starter switch)
II = Lights

INSTRUCTIONS AND WIRING DIAGRAM FOR DYNAMO MAGNETO 12 V 75 W AND BOSCH INERTIA PINION TYPE STARTER (Type DG)

The dynamo magneto generates alternating current with a lighting power of 75 Watt at 12 Volt.

The two yellow lighting leads are to be connected up to the rectifier for charging a 12 Volt 38 (or 32) Ah battery for lighting and for operating the electric starter (see wiring diagram).

During day operation, because of overcharging the battery, only one circuit is connected up, during night operation both circuits are connected up.

The bulbs should be so selected that they give a total load of 50 Watt.

Care should be taken to ensure proper wire cross sections for starter operation and a good earth connection between battery, chassis and lamps.

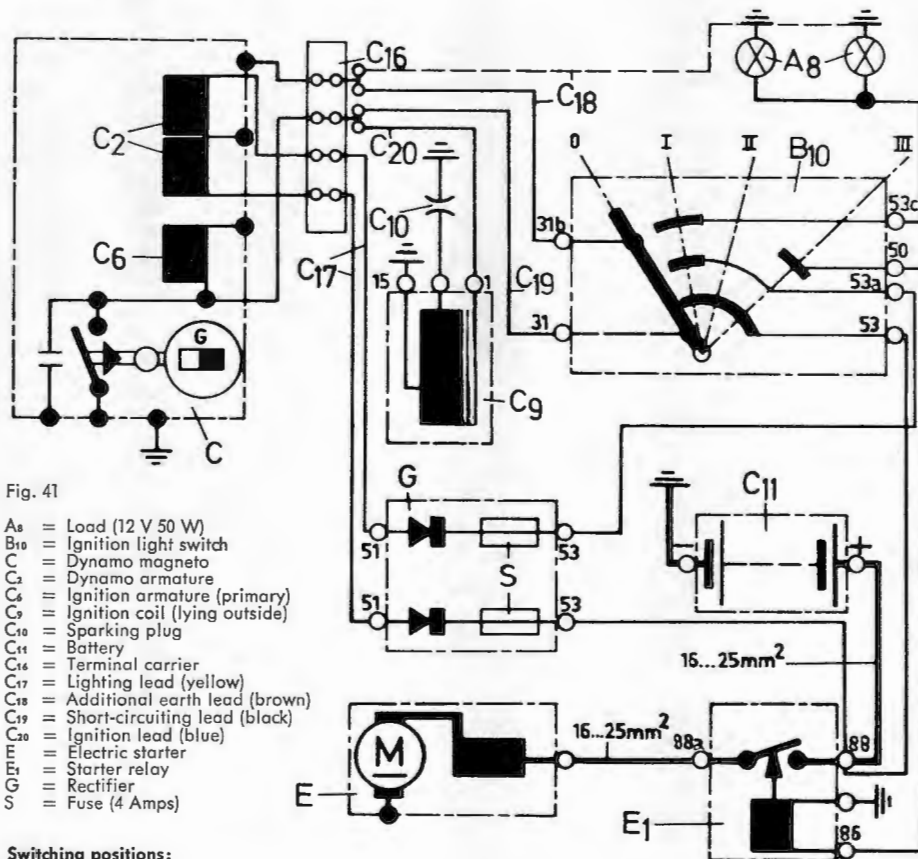


Fig. 41

- A₈ = Load (12 V 50 W)
- B₁₀ = Ignition light switch
- C = Dynamo magneto
- C₂ = Dynamo armature
- C₆ = Ignition armature (primary)
- C₉ = Ignition coil (lying outside)
- C₁₀ = Sparking plug
- C₁₁ = Battery
- C₁₄ = Terminal carrier
- C₁₆ = Lighting lead (yellow)
- C₁₇ = Additional earth lead (brown)
- C₁₈ = Short-circuiting lead (black)
- C₁₉ = Ignition lead (blue)
- C₂₀ = Starter relay
- E = Electric starter
- E₁ = Starter relay
- G = Rectifier
- S = Fuse (4 Amps)

Switching positions:

- 0 = Off (Ignition short-circuited)
- I = Night operation
- II = Day operation
- III = Start (electric)

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LAYING-UP THE ENGINE

If the engine is not used for a fairly long time (e. g. in summer), there is a danger of rusting. In such cases the following precautions should be taken to protect the engine:

1. Mix the fuel with a running-in and anti-corrosion oil in 25 : 1 proportion and run the engine on this mixture for a short time. Use oils with a viscosity grade SAE 30 as supplied by leading oil companies (e. g. ENSIS Oil 30 available from SHELL).



After the last run before laying-up, the engine should be stopped at full operating speed by means of the short-circuiting button, while the choke on the carburettor should be kept closed. When the engine has stopped, close the fuel tap. These precautions will adequately protect the crankshaft, connecting rod and main bearings against corrosion.

2. To protect the cylinder and the piston, place the piston at top dead center, unscrew the sparking plug and pour 3...5 cc (0.106...0.176 fl. oz.) of anti-corrosion oil through the sparking plug hole. Then turn the engine 15...20 times by means of the starter and screw in the spark plug.
3. To protect the engine externally, it is recommended that anti-corrosion oils be used as supplied by the leading oil companies;

for example:

Anticorit MR 5 supplied by Messrs. FUCHS, 68 Mannheim, Germany
Lubrication Oil MIL-L-644 B supplied by MOBIL OIL
Shell ENSIS Fluid 260 supplied by SHELL
RUST BAN 395 supplied by ESSO

If the engine is laid up for more than six months with fuel in the tank, separation of the gasoline and oil in the fuel mixture may occur. In such cases we strongly recommend mixing the two constituents anew by stirring, or that they be replaced.

LUBRICATION AND MAINTENANCE CHART		Maintenance time schedule				
		Daily	Every 100 hours	Every 200 hours	When required	On assembly
 <p>322</p>	<p>Intake silencer Remove intake silencer, clean in gasoline and blow out with compressed air.</p>	if very dirty			X	
 <p>303</p>	<p>Spark plug A provisional cleaning of the spark plug from carbon residue can be made on the insulator foot between the electrodes. An efficient cleaning can only be achieved by means of a sandblast unit.</p> <p>Functional check Unscrew spark plug, fit spark plug terminal, put spark plug thread in ground contact (cylinder head) and operate starter. If the spark plug is in good order, a strong spark must flash across the electrodes. Gap between electrodes 0.5 mm (0.020 in.), see drawing.</p>				X	
Carburettor	Clean and adjust.				X	
Ignition system	Check and, if necessary, adjust contact breaker.	X				
	Apply BOSCH Ft 1 v 4 special grease to felt lubricator for contact breaker cam.		X			
Engine and exhaust muffler	Decarbonize (see page 22).		X			
Recoil starter	Smear coil spring with Aero SHELL grease T4. Fill the 4 oil grooves in the pulley with the same lubricant. Lubricate starter cord and pawls lightly with SAE 10 oil.					X
Pinion on solenoid-controlled starter, pinion on inertia-pinion type starter and toothed rim on magneto flywheel	Clean with gasoline and lubricate with graphite grease (e. g. BOSCH special grease Ft 1 v 13).					X
Cylinder, connecting rod bearings, crankshaft bearings	By two-stroke mixture, i. e. commercial HD grades SAE 40 or 50 of leading oil companies (which correspond to the API classification MS and MIL-L 2104 A) with commercial brands of gasoline mixed at a ratio of 1:25. Or use SACHS Special Motor Oil (F & S Part No. 0263 005 100) which is available in cans.					

TIGHTENING TORQUES FOR BOLTS AND NUTS

Bolts

F & S-No.	Qty.	Used on	Dimension	Tightening Torque
0940 120 200	4	Magneto ring in magneto housing	M 6 x 10	0.9... 1.1 kpm (6.5... 8.0 ft. lb.)
1440 039 001	4	Crankcase	M 8 x 80	2.4... 2.6 kpm (17.4...18.8 ft. lb.)
1940 107 000	2	Crankcase	M 8 x 60	2.4... 2.6 kpm (17.4...18.8 ft. lb.)
1440 038 001	4	Cylinder head	M 8 x 60	3.3... 3.5 kpm (23.9...25.3 ft. lb.)
0240 056 001	3	Armature base plate . .	M 5 x 12	0.4... 0.5 kpm (2.9... 3.6 ft. lb.)

Nuts

F & S-No.	Qty.	Used on	Dimension	Tightening Torque
1942 001 000	4	Cylinder	M 10 (SW 14)	4.6... 4.8 kpm (33.3...34.7 ft. lb.)
0242 009 000	4	Cylinder	M 10 (SW 17)	2.0... 2.2 kpm (14.4...15.9 ft. lb.)
0316 057 100	4	Fan	M 6	0.5... 0.6 kpm (3.6... 4.3 ft. lb.)
1442 005 001	1	Crankshaft, magneto side	M 14 x 1.5	9.0... 9.5 kpm (65.1...68.7 ft. lb.)

SW 14 = 14 mm (0.551 in.) across flats

SW 17 = 17 mm (0.669 in.) across flats

REPAIR DIMENSIONS

SACHS SA 340

Cylinder assy. No.	Standard 2487 025 000		1st rebore 1487 025 001		2nd rebore 1487 025 002	
Cylinder dia.	mm $+0.049$ 75.5 $+0.030$	ins. $+0.00193$ 2.9724 $+0.00118$	mm $+0.049$ 76 $+0.030$	ins. $+0.00193$ 2.9913 $+0.00118$	mm $+0.049$ 76.5 $+0.030$	ins. $+0.00193$ 3.0118 $+0.00118$
Piston assy. No.	1486 036 005		1486 036 006		1486 036 007	
Punched in dimension	75.5 mm		76 mm		76.5 mm	
Piston ring No.	1415 006 000		1415 006 001		1415 006 002	
Piston pin No.	1416 004 000					
Connecting rod bush No.	1432 028 001 Bore 22 mm $+0.020$ -0.030		0.86614 in. $+0.00078$ -0.00118 ream to 22 mm $+0.050$ $+0.030$		0.86614 in. $+0.00196$ -0.00118	

SACHS SA 340 SS (cylinder with Ni-Resist liner)

Cylinder assy. No.	Standard 1487 025 015		1st rebore 1487 025 016		2nd rebore 1487 025 017	
Cylinder dia.	mm $+0.049$ 75.5 $+0.030$	ins. $+0.00153$ 2.9724 $+0.00078$	mm $+0.039$ 76 $+0.020$	ins. $+0.00153$ 2.9913 $+0.00078$	mm $+0.039$ 76.5 $+0.020$	ins. $+0.00153$ 3.0118 $+0.00078$
Piston assy. No.	1486 036 025		1486 036 026		1486 036 027	
Punched in dimension	75.5 mm		76 mm		76.5 mm	
L-Piston ring No.	1415 007 005		1415 007 006		1415 007 007	
Piston ring No.	1415 006 020		1415 006 021		1415 006 022	
Piston pin No.	1416 004 000					
Connecting rod bush No.	1432 028 001 Bore 22 mm $+0.020$ -0.030		0.86614 in. $+0.00078$ -0.00118 ream to 22 mm $+0.050$ $+0.030$		0.86614 in. $+0.00196$ -0.00118	

SACHS SA 370

Cylinder assy No.	Standard 1487 020 000		1st rebore 1487 020 001		2nd rebore 1487 025 002	
Cylinder dia.	mm $79 \begin{smallmatrix} + 0.049 \\ + 0.030 \end{smallmatrix}$	ins. $3.1102 \begin{smallmatrix} + 0.00193 \\ + 0.00118 \end{smallmatrix}$	mm $79.5 \begin{smallmatrix} + 0.049 \\ + 0.030 \end{smallmatrix}$	ins. $3.1299 \begin{smallmatrix} + 0.00193 \\ + 0.00118 \end{smallmatrix}$	mm $80 \begin{smallmatrix} + 0.049 \\ - 0.030 \end{smallmatrix}$	ins. $3.1496 \begin{smallmatrix} + 0.00193 \\ + 0.00118 \end{smallmatrix}$
Piston assy. No.	1486 032 005		1486 032 006		1486 032 007	
Punched in dimension	79 mm		79.5 mm		80 mm	
Piston ring No.	1415 003 100		1415 003 001		1415 003 002	
Piston pin No.	1416 002 000					
Connecting rod bush No.	1432 028 001	Bore 22 mm $\begin{smallmatrix} + 0.020 \\ - 0.030 \end{smallmatrix}$	0.86614 in. $\begin{smallmatrix} + 0.00078 \\ - 0.00118 \end{smallmatrix}$	ream to 22 mm $\begin{smallmatrix} + 0.050 \\ + 0.030 \end{smallmatrix}$	0.86614 in. $\begin{smallmatrix} + 0.00078 \\ - 0.00118 \end{smallmatrix}$	

ENGINE FAULTS

A number of possible faults are listed below, together with likely causes.

A. Engine refuse to start

a) Plug not sparking, because

1. Plug oiled up, damp, shorted or damaged,
2. Exterior of plug wet,
3. Ignition lead loose or broken,
4. Short-circuit button jams, or leads from engine are damaged,
5. Breaker contacts oiled up, damp or burnt,
6. Ignition armature or condenser damaged.

b) No fuel reaching engine, because

1. No fuel in tank,
2. Fuel cock closed,
3. Fuel strainer clogged,
4. Fuel line blocked,
5. Jets clogged.

c) Fuel mixture not ignitable, because

1. Carburettor flooded,
2. Water in carburettor,
3. Infiltrated air due to loose carburettor.

d) Lack of compression, because

1. Piston rings broken,
2. Piston and cylinder worn,
3. Vent cock on crankcase open,
4. Cylinder head or spark plug loose.

B. Engine lacks power

a) Due to dirty components, because

1. Intake silencer soiled,
2. Exhaust and transfer ports in cylinder clogged with carbon.
3. Thick carbon deposit in cylinder head,
4. Fuel tank gets no air (filler cap),
5. Spark plug vitrified.

b) Due to lack of compression, because (see under "Lack of compression, because").

C. Other engine faults

a) Engine runs unevenly, because

1. Ignition lead loose or damaged,
2. Engine overheats; fuel vapor lock in carburettor interrupts fuel supply,
3. Contact breaker points oiled up or fused,

4. Locating pin for contact breaker arm worn,
5. Spark plug or spark plug terminal or ignition armature not in order.

b) Engine four-strokes and does not reach speed, because

1. Choke closed,
2. Carburettor floods due to clogged or damaged inlet needle seating,
3. Exhaust duct clogged with carbon,
4. Carburettor setting incorrect or jets loose,
5. Intake silencer soiled.

c) Engine pinks at full speed under load, because

1. Ignition too far advanced,
2. Combustion chamber needs decarbonizing,
3. Cooling fins soiled,
4. Small end bushing worn.

d) Engine backfires or spits into carburettor, because

1. Engine not getting adequate fuel,
2. Spark plug glows due to incorrect heat value,
3. Spark plug shorted, dirty or vitrified,
4. Engine getting infiltrated air,
5. Water in carburettor.

e) Engine gets too hot and piston seizes, because

1. Engine badly decarbonized (piston crown polished clean),
2. Engine not getting sufficient fuel,
3. Carburettor adjusted incorrectly or wrong oil used,
4. Cooling fins on cylinder and cylinder head soiled,
5. There are pre-ignitions.

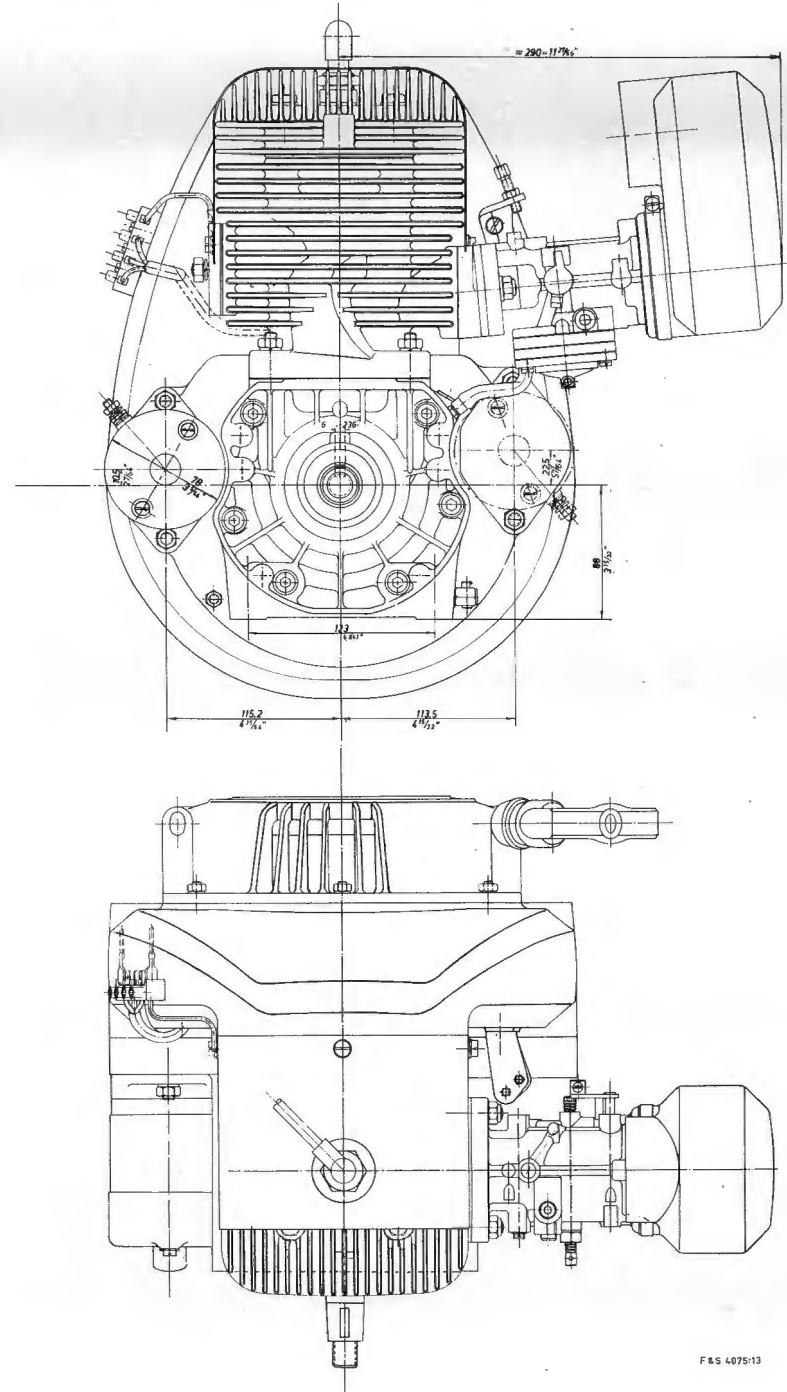
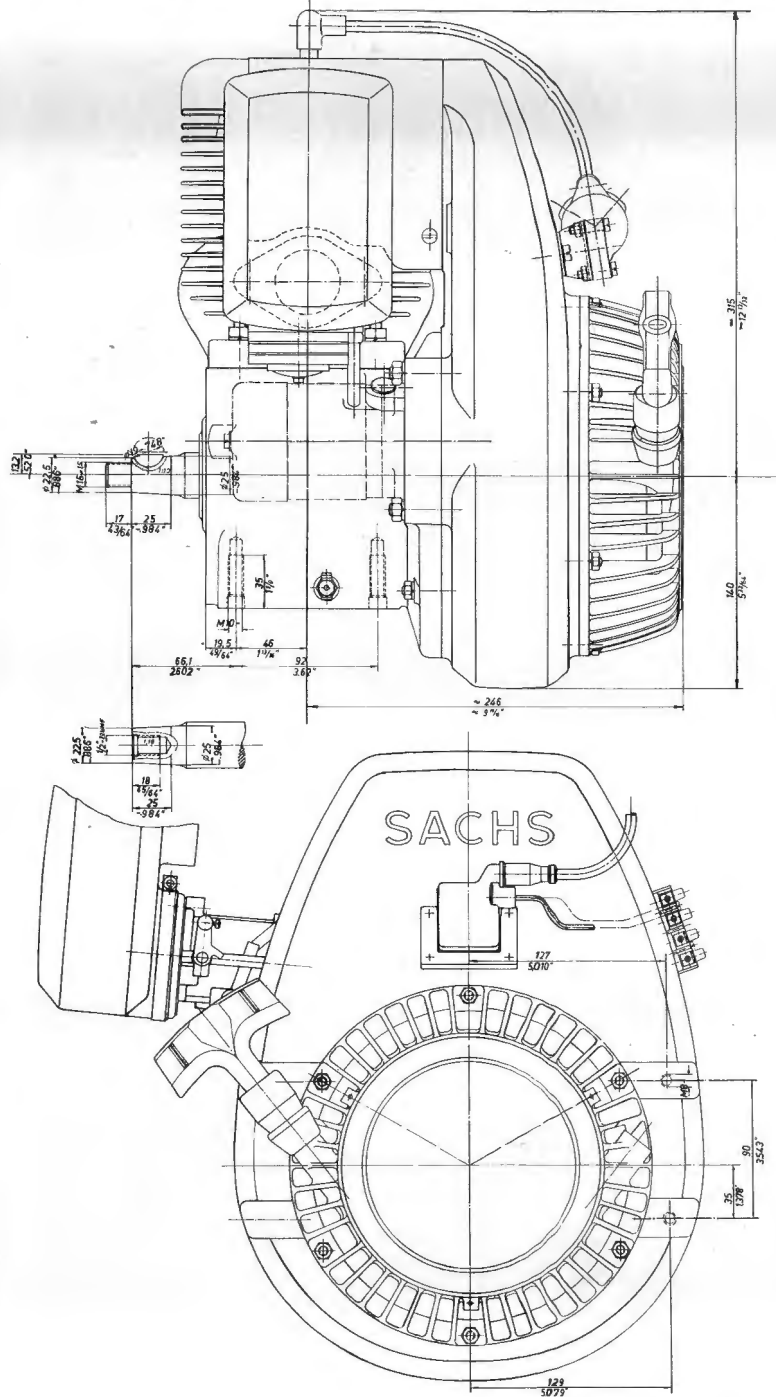
f) Engine has no idling speed, because

1. Idling adjustment screw or idle stop screw incorrectly adjusted,
2. Control cable for butterfly valve wrongly adjusted,
3. Ignition armature damaged.

g) Fuel consumption of engine is too high, because

1. Fuel tank, fuel line or carburettor leaking,
2. Jets too large.

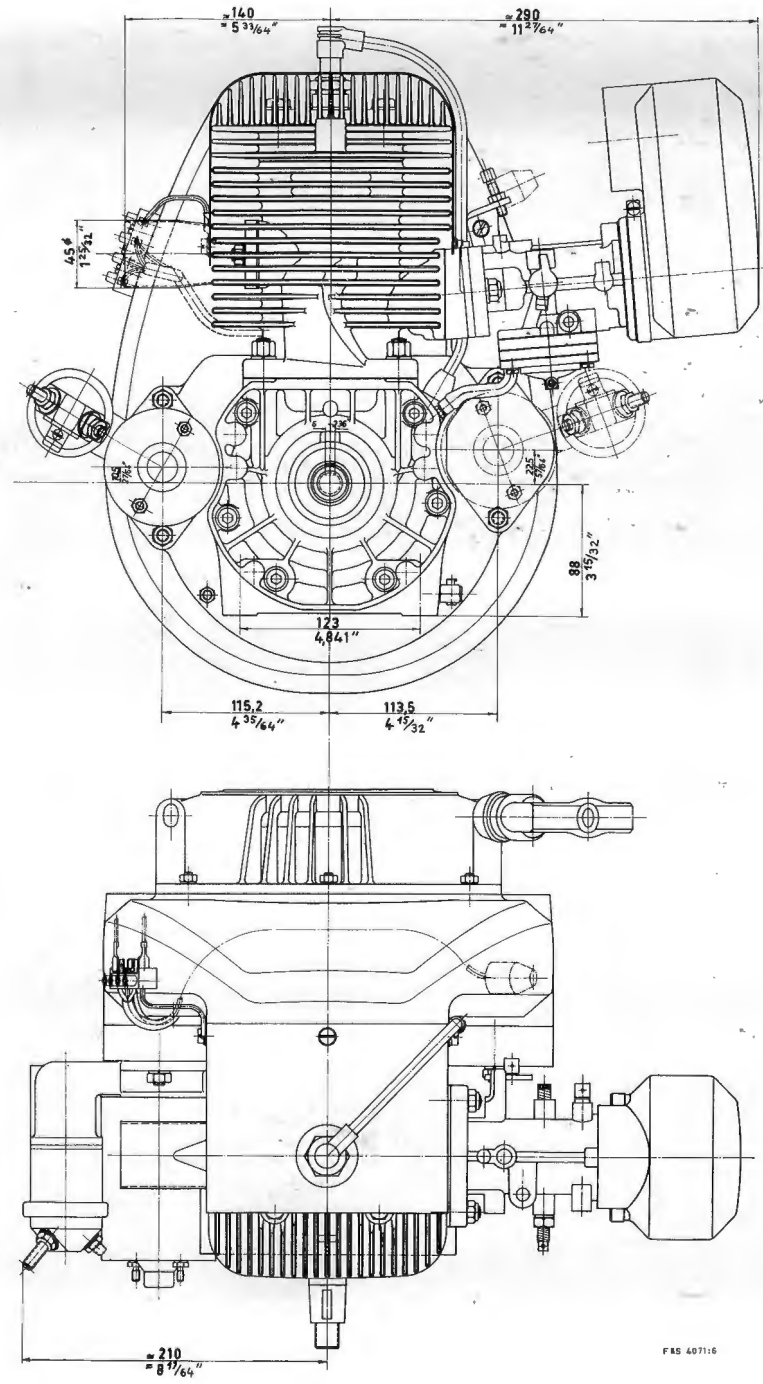
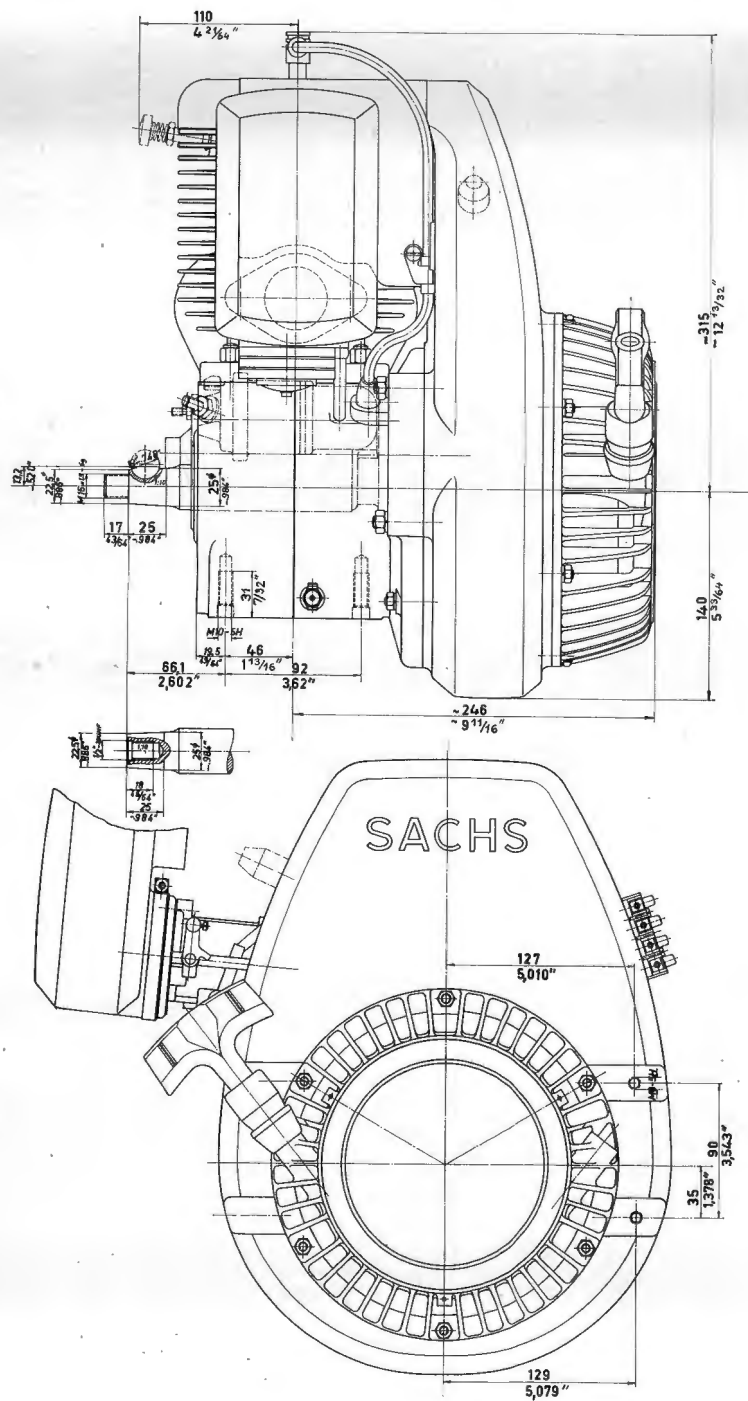
INSTALLATION DIMENSIONS FOR SACHS 340 and 340 SS (with inertia-pinion type starter)



F & S 4075-13

In the interest of technical progress we reserve the right to introduce modifications without notice.

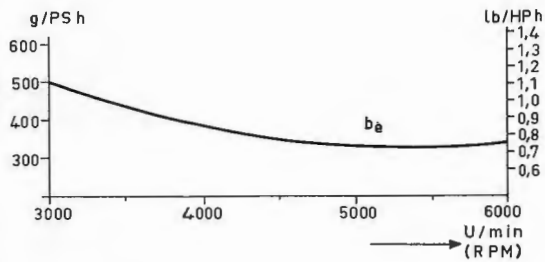
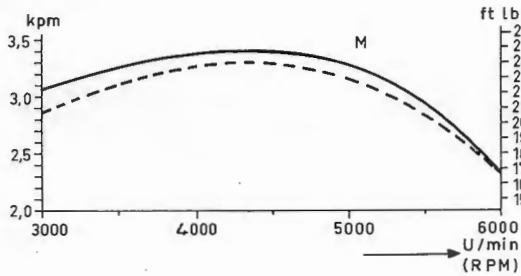
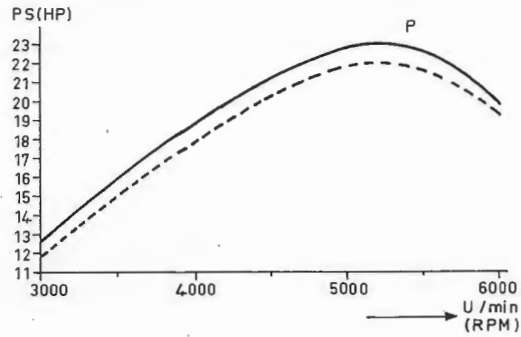
INSTALLATION DIMENSIONS FOR SACHS SA 370



In the interest of technical progress we reserve the right to introduce modifications without notice.

TECHNICAL DATA

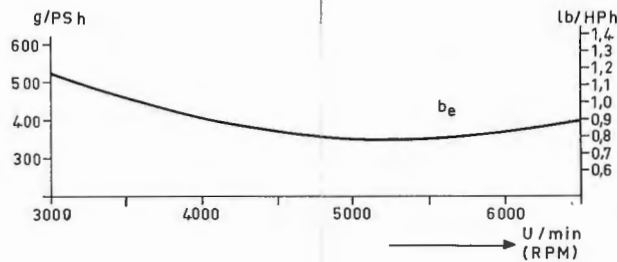
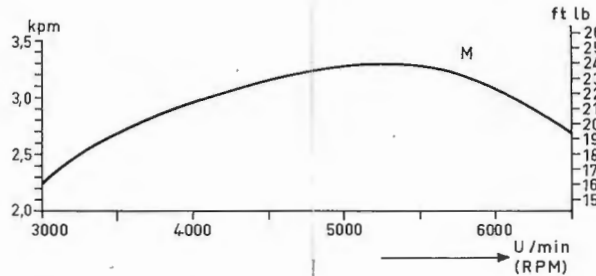
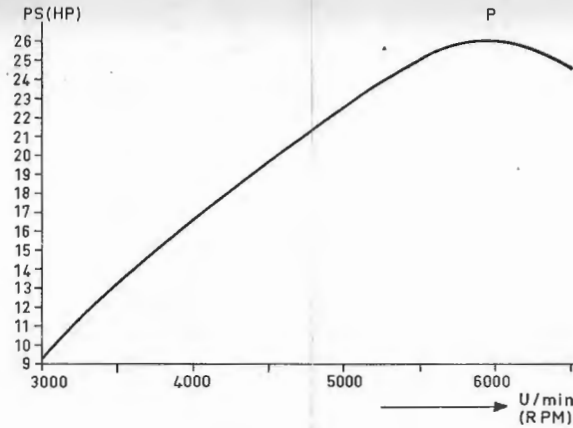
SACHS SA 340



F. B. S. 4075:4

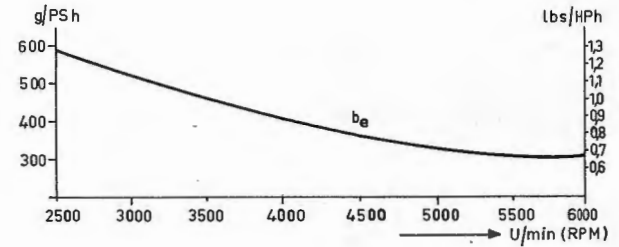
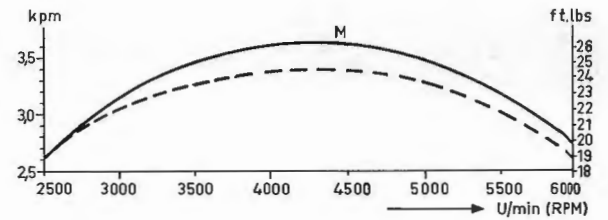
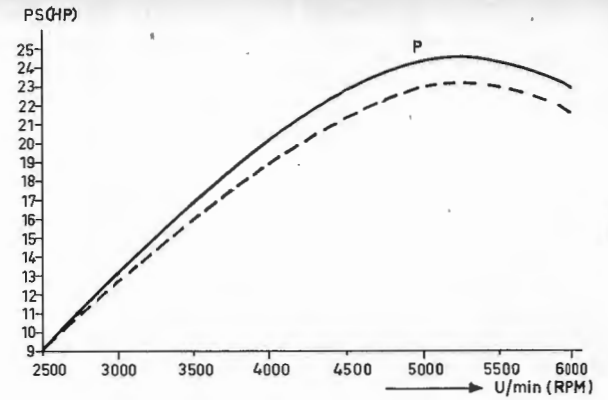
— with aluminum cylinder
 --- with grey cast iron cylinder

SACHS SA 340 SS (super sport)



F. B. S. 4075:5

SACHS SA 370



F. B. S. 4071:5

— with carburettor HD-13 A
 --- with carburettor HR-18 A

The indicated engine performance is valid for barometric reading $b_0 = 760$ mm Hg and air temperature $t_L = 20^\circ$ C for the fully run-in engine with a tolerance of $\pm 5\%$. To obtain the performance according to DIN 6270 ($b_0 = 736$ mm Hg and $t_L = 20^\circ$ C) the performance given above must be multiplied by the correction factor 0.97.

In the interest of technical progress we reserve the right to introduce modifications without notice.