NO410 M

MAINTENANCE MANUAL

MANUEL DE REPARATION · REPARATIE-HANDLEIDING · INSTANDSETZUNGSANWEISUNGEN

for NSU Dealers · à l'usage des représentants NSU · voor NSU-handelaars · für NSU-Vertreter

Technical Data · List of Special Tools · Flat Rate Repair Times

Caractéristiques · Outillage spécial · Barème des réparations

Technische gegevens · Lijst van speciaal gereedschap · Richtlijden voor reparaties

Technische Angaben · Spezialwerkzeug-Liste · Arbeitsrichtzeiten

Quickly

NSU WERKE AKTIENGESELLSCHAFT NECKARSULM

ENGINE

Engine	= NSU Quickly, unit construction
Cycle	= Two-stroke
Cylinder	= Light-alloy, with hard-chromed bore
Bore	= 40 mm
Stroke	= 39 mm
Capacity	= 49 cc
Compression space	= 10.9 cc
Compression ratio	= 5.5 : 1
Maximum engine speed	= 5200 r. p. m.
Output	= 1.4 h. p.
Compression pressure	= 2.57 kg/sq cm (35.5 lb/sq in)
Piston clearance	= 0.015 to 0.025 mm (0.0006 to 0.001 in)
Gudgeon-pin diameter	= 10—0.05 mm
Little-end diameter	= 10+0.028 mm +0.013 mm
Axial crankshaft play	= 0.3 mm maximum, otherwise must be corrected
Lubrication	= Petroil mixture
Control of gas flow	= By cylinder ports

CARBURETTER

Fuel oil : petrol ratio	= 1:25
Carburetter	= BING Type 1/9/1. Main jet 56. Needle position 2. Needle jet 2.10
Air cleaner	= Wet air filter (in frame) with strangler

IGNITION

Type of ignition	= Flywheel magneto and lighting generator, 6-volt, 3-watt
Ignition timing	= 2.1 mm or 24° before TDC
Contact-breaker gap	= 0.2—0.3 mm (0.008—0.012 in)
Sparking plug, standard	= Bosch, W 240 T 11
Sparking-plug electrode gap	= 0.5 mm (0.02 in)

CLUTCH

Clutch	= Multi-plate clutch
Clutch operation	= By hand
Clutch spring pressure	= 47.5 kg (104.7 lb)
Clutch adjuster	= On handlebars

GEARBOX

Gearbox	= NSU two-speed gearbox built in unit with engine
Gearbox oil capacity	= 135 cc (0.21 pint) SAE 20 in winter SAE 30 in summer
Engagement	= By dogs

Removing Engine from Frame and Replacing

(M 01)

Special tools required:

None.

1. Place the front wheel in a stand. (A suitable stand can be made up very simply in either wood or metal, the design being based on a normal bicycle stand).

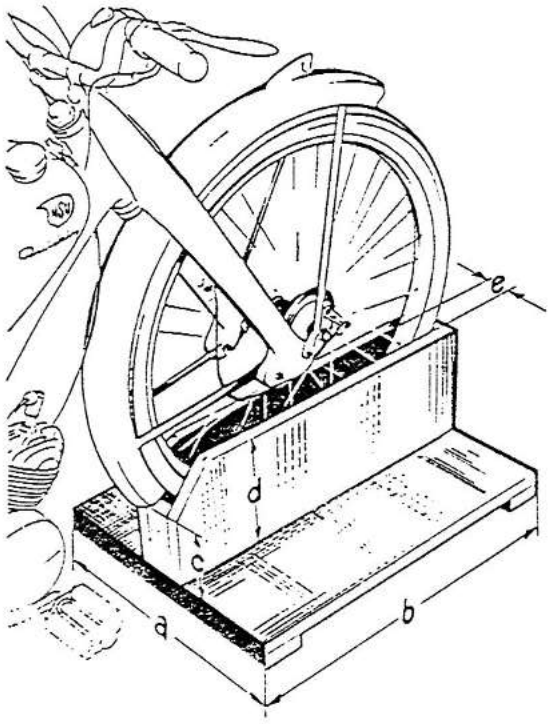


Fig. M 01/1

a = 55 cm (22 in) b = 60 cm (24 in) c = 15 cm (6 in)
d = 20 cm (8 in) e = 5 cm (2 in)

2. Close fuel tap.

3. Clean engine externally.

4. Unscrew two slotted screws and take off front left-hand chainguard section. Take care not to lose the spacer tube. This is not fitted in the latest model.

5. Turn chain until spring link is on rear chain sprocket. Undo and remove spring link. Take off chain. Release clutch lever.

6. Loosen silencer clip and bolt on frame. Unscrew nut holding exhaust pipe in cylinder. Remove exhaust pipe and silencer.

7. Knock out left-hand pin on bearing tube for central stand. Push tube out to the right, so that stand is removed from crankcase.

8. After removing the split pin or the locking wire on the brake lever, disconnect the brake rod.

9. Push in the clutch lever. Disconnect the clutch cable and withdraw through slot in left-hand crankcase cover.

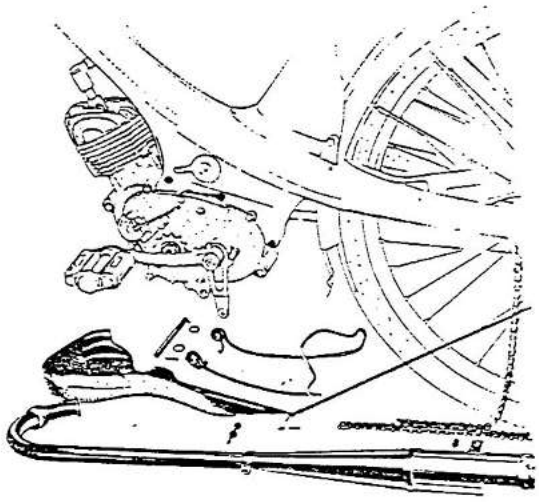


Fig. M 01/2—9

10. Disconnect decompression cable from valve in cylinder head.

11. Unscrew countersunk screw and remove cover from flywheel magneto and lighting generator. Take care not to lose the spacer tube. This also is no longer fitted to the latest model.

12. Disconnect lighting lead from terminal and pull upwards through rubber sleeve.

13. Pull off rubber elbow between carburetter and air filter.

14. Unscrew two nuts (box spanner) and take off carburetter and gasket.

Primary drive, engine-gearbox	= By spur gears
Rear drive, gearbox — rear wheel	= By chain
Reduction, engine — gearbox	= 5.33:1
Gearbox ratios	= 1.88:1 1:1
Reduction, gearbox — rear wheel	= 3:1
Overall reduction ratios	= 30.06:1 15.99:1
Power transmission	= Chain 12.7×4.88 mm = 112
Chain sprockets	= Gearbox, 12 teeth. Rear wheel, 36 teeth
Axial play of gearbox shafts	= 0.2 mm (0.008 in) (not corrected)

WHEELS AND BRAKES

Tyre size	= Low pressure, 26×2
Tyre pressure	= Front tyre about 1.5 kg/sq cm (21 lb/sq in) Rear tyre about 1.75 kg/sq cm (25 lb/sq in)
Rims	= 26×2 well-base rims
Spokes	= Front wheel, L. H., 2.65 mm dia. 263 mm (10⅜ in) long Front wheel, R. H., 2.65 mm dia. 235 mm (9¼ in) long) Rear wheel, L. H., 3.00 mm dia. 235 mm (9¼ in) long Rear wheel, R. H., 3.00 mm dia. 263 mm (10⅜ in) long
Leading dimension for spoking up wheels	= Front wheel: 20.5 mm (13/16 in) from outer edge of brake drum to edge of rim Rear wheel: 30.15 mm (13/16 in) from outer edge of chain sprocket to edge of rim
Front brake	= Internal expanding brake
Rear brake	= Internal expanding brake
Brake operation	= Front: By hand Rear: By foot

OTHER DATA

Maximum heigth	= 960 mm, adjustable (37.8 in)
Maximum width	= 642 mm (25.3 in)
Overall length	= 1895 mm (74.6 in)
Heigth of saddle	= 780 mm, adjustable (30.7 in)
Frame	= Pressed-steel beam type
Front forks	= Swinging-link springing
Permissible load	= 1 person
Foot rests	= Pedals
Stand	= Central stand
Fuel tank capacity	= 3.1 litres (5½ pints), of which 0.4 litres (¾ pint) is reserve supply

EQUIPMENT

Electrical equipment	= Flywheel ignition and lighting generator. Headlamp. Rear lamp.
Other equipment	= Tool kit. Luggage carrier. Lock. Tyre pump

Stripping the Engine after it has been removed from the Frame

(M 02)

Special tools required

1 Set of Quickly special tools with engine clamping fixture No. 16 91 01 914.

1 Standard commercial rotor extractor (30×1 mm thread) or Fox extractor No. 048 422 007.

1 Assembly stand No. 048 422 000.

1. Secure engine in clamping fixture (16 91 00 901), and place upright.
2. Drain off oil. To do this unscrew drain plug and overflow screw in left-hand crankcase cover.

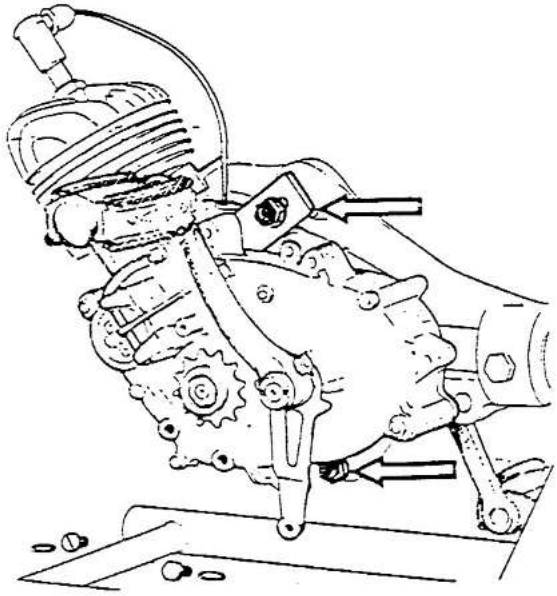


Fig. M 02/1—2

3. Unscrew nuts from both ends of pedal crank spindle using box spanner (16 91 00 902). Remove lock washers.

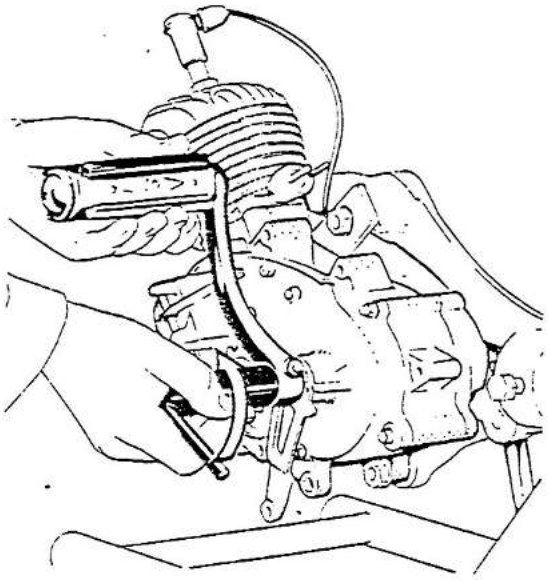


Fig. M 02/3

4. Unscrew nuts and remove washers from crank cotter pins. Knock out cotters with a soft metal punch, and pull off cranks and pedals.
5. Unscrew ignition lead cap. Unscrew sparking plug, and take cap off ignition lead.
6. Unscrew cylinder-head nuts. Remove washers. Take off cylinder head, gasket, and cylinder.

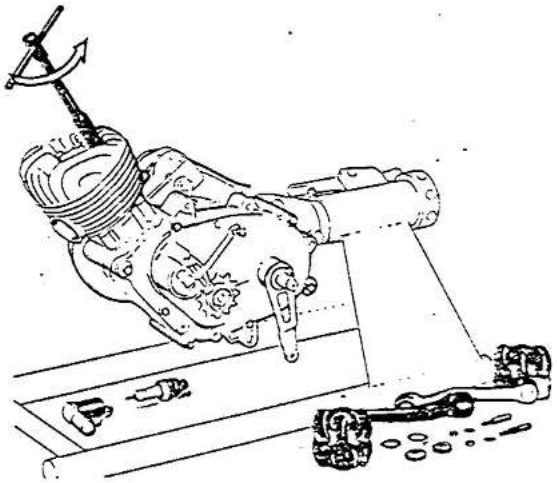


Fig. M 02/4—6

7. Cover cylinder opening in crankcase with a clean cloth. Remove circlips holding gudgeon pin. Carefully warm piston up evenly to a temperature of about 120° C (250° F), and push gudgeon pin out with gudgeon-pin punch (16 91 00 903). Remove piston and take off gasket (between cylinder and crankcase).

Fig. M 02/7

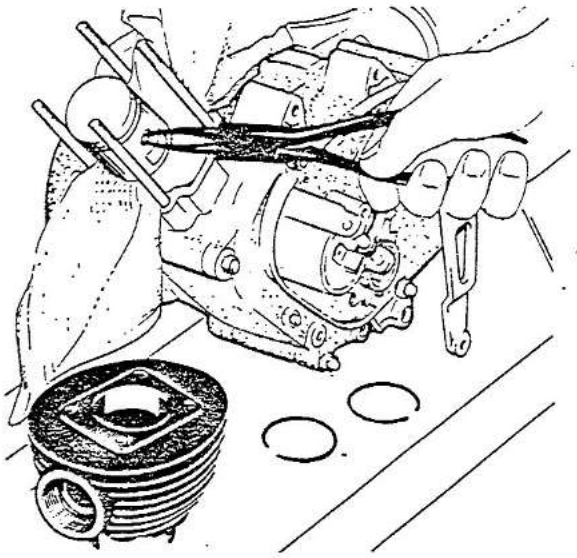


Fig. M 02/7a

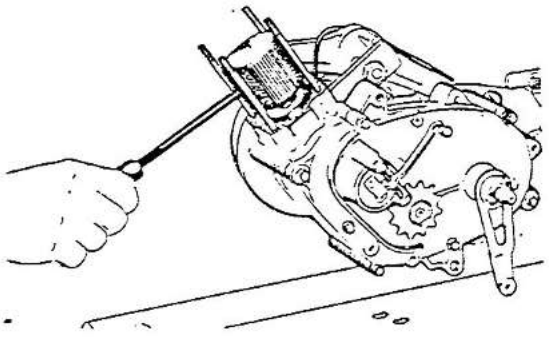


Fig. M 02/7b

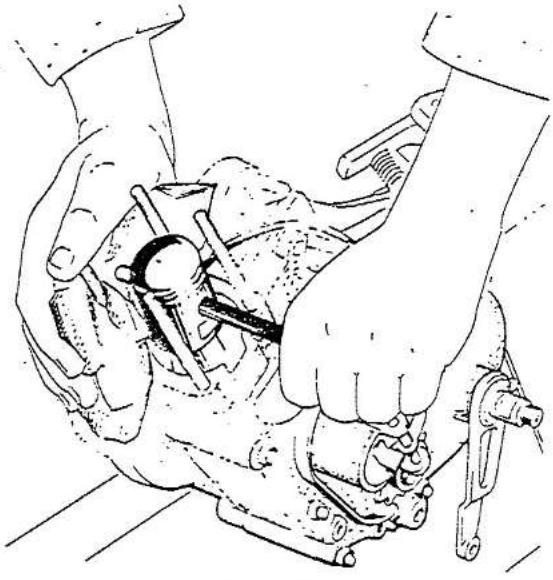


Fig. M 02/7c

8. Turn the engine so that the right-hand side is uppermost.

9. To take off the flywheel (with pole shoes), it is first necessary to loosen the nut which holds it. This nut should, however, not be removed completely, but only unscrewed level **with the outside of the flywheel** when **extractor 16 91 00 904 is used.** This will prevent the main shaft from spreading. If extractor 16 91 01 904, which has a brass cap, is used, the nut should be completely removed, and the brass cap placed over the main shaft in its place. This brass cap can also easily be made up locally and used in conjunction with an existing extractor type 16 91 00 904. The latest type of extractor to be supplied, 16 91 02 904, is provided with a threaded bush which screws onto the main shaft. There is no difference in the method of using the extractor. Hold the flywheel with holder (16 91 00 913). Remove the flywheel.

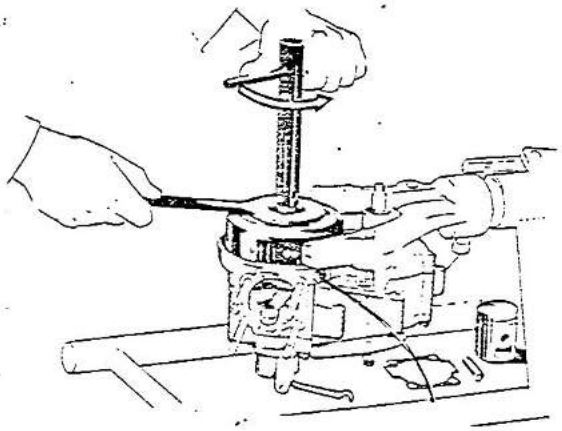


Fig. M 02/9

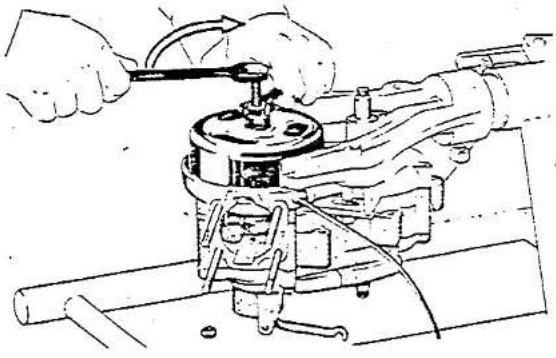


Fig. M 02/9a

10. Unscrew both cheesehead screws on the back plate and the cheesehead screw on the terminal plate. Take off the back plate.

11. Take off the outer circlip and the washer on the gearchange shaft.

15. Set gearchange twistgrip to top gear.

16. Push gearchange lever inwards, disconnect cable, and pull through hole in crankcase cover.

17. Remove three mounting bolts and drop engine out of frame.

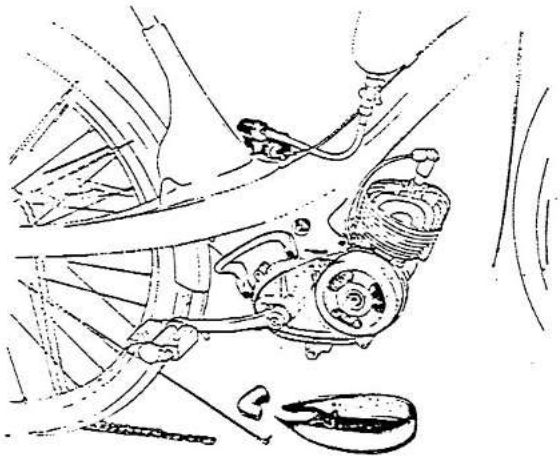


Fig. M 01/10—17

Replacing the engine

18. The engine should be replaced in the frame in the reverse order.

Regarding item 4

Before fitting the two chainguard sections carry out a trial run.

Regarding item 5

Note. Spring link must always be fitted with the spring clip on the outside and with its closed end facing the direction in which the chain travels.

Regarding item 6

On assembly insert a sealing ring before placing the exhaust pipe in the exhaust opening in the cylinder.

Regarding item 17

Make absolutely certain that star washers are placed under the nuts and the heads of the hexagon bolts, so that the bolts cannot loosen in service and so introduce vibration. In the current model, the star washers under the heads of the two bolts that hold the carrying handle have been replaced by locking plates. The star washers fitted to previous models should be replaced by these locking plates if repairs are undertaken.

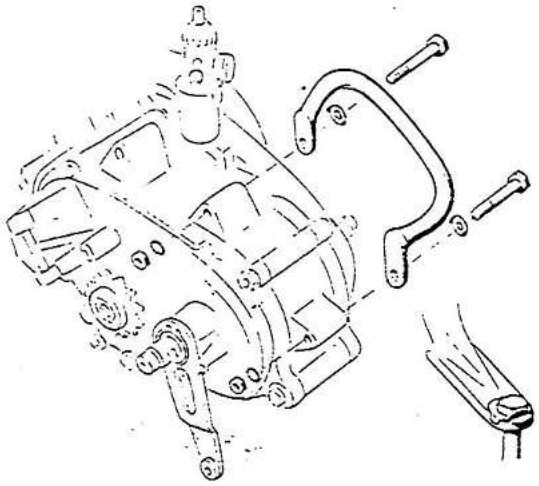


Fig. M 01/17

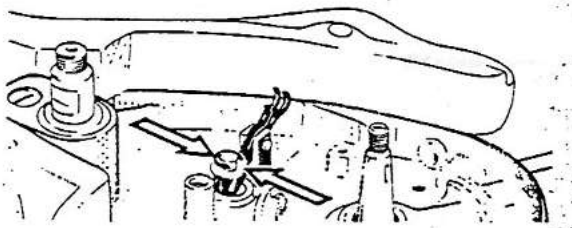


Fig. M 02/11

12. Turn the engine so that the left-hand side is uppermost.

13. Unscrew the nut on the gearbox mainshaft holding the chain sprocket. Hold the chain sprocket while doing this by jamming a rod between the chain sprocket and the clutch casing. Take off the lock washer.

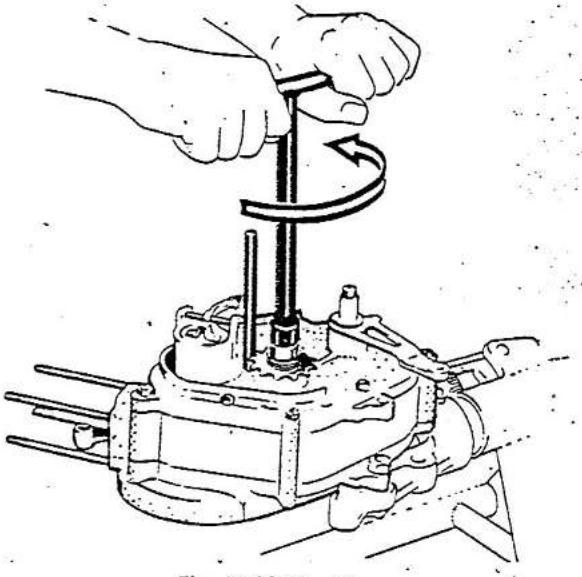


Fig. M 02/12—13

14. Remove the chain sprocket with a normal commercial rotor extractor or the Fox extractor (048 422 007). Take out the key. Remove the rubber sealing ring from the chain sprocket. These sealing rings are not fitted to the latest model.

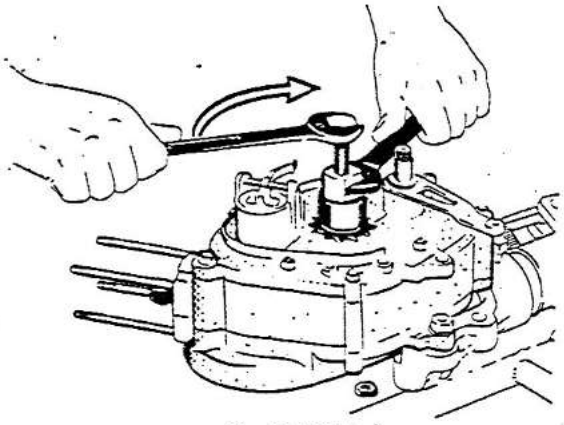


Fig. M 02/14

15. Take the outer circlip off the brake lever. Take off the brake lever.

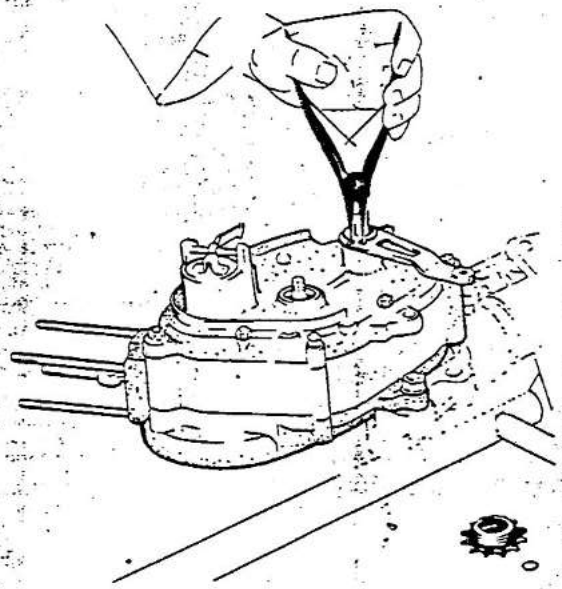


Fig. M 02/15

16. Unscrew 7 nuts with lock washers and 1 bolt with nut and lock washer from left-hand crankcase cover.
Note. Before taking off the cover plate, stick the filler piece (16 91 00 905) in the groove milled for the cotter pin in the pedal crank spindle, so that the two rubber sealing rings in the brake actuating sleeve are not damaged by becoming caught against the edges of the groove. Take off the crankcase cover plate, if necessary loosening it by hitting it with a rubber hammer. Take off the circlip and remove the brake actuating sleeve from the crankcase cover plate. Remove the cover plate gasket.
Do not knock against the top edge of the cover plate (hole for passage of clutch cable), since there is the danger that the cover plate may fracture.

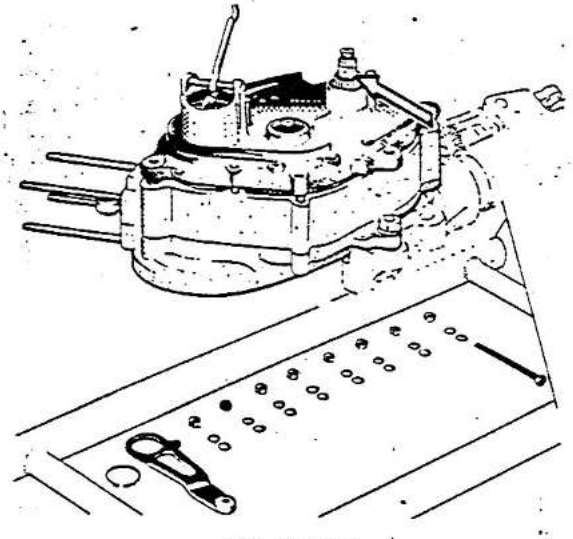


Fig. M 02/16

17. Push the spring clip to one side off the clutch cup by means of a screwdriver.

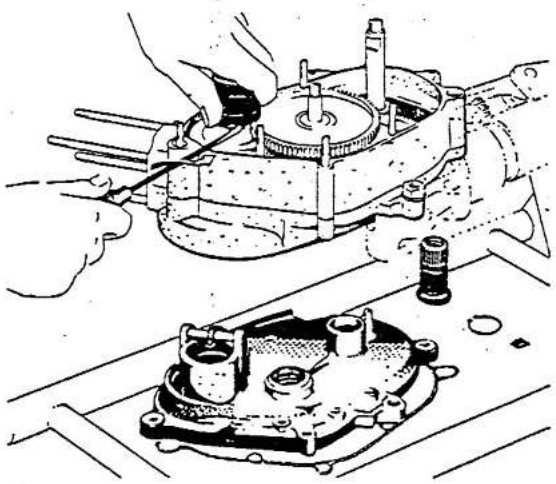


Fig. M 02/17

18. Force off the clutch-operating cup with the levers (16 91 00 908).
Note. Strips of metal or cleaning rags must be placed on the edge of the crankcase under the levers, so that the levers do not damage the sealing surface.

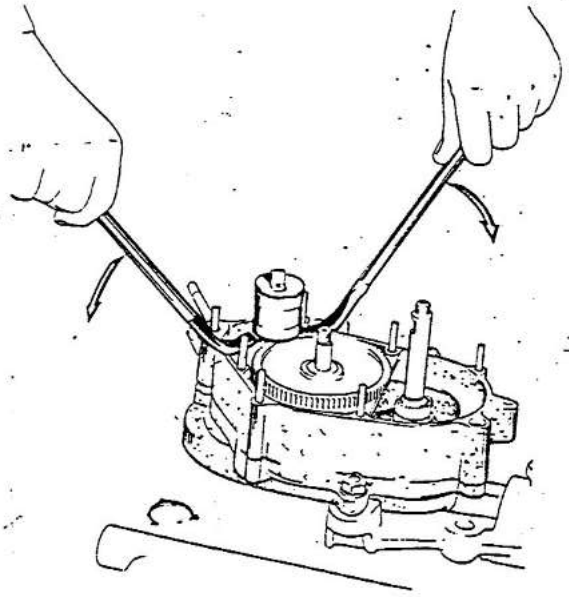


Fig. M 02/18

19. Unscrew a nut and two lock washers from the shaft. Hold the shaft by means of holder (16 91 00 912) placed on the gear pinion, and if necessary by means of a block of wood placed under the big end. Remove the clutch spring with the outer spring cup and the ball bearing which contains the inner spring cup.

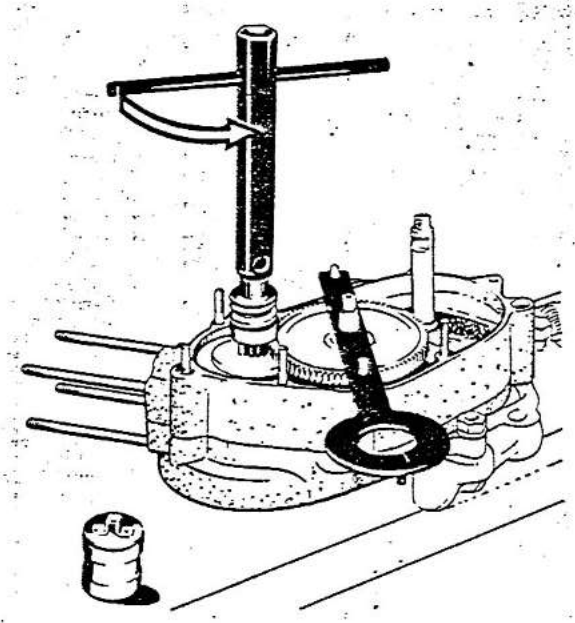


Fig. M 02/19

20. Remove washer and gear pinion from gearbox mainshaft.
Note: Use no force, since the gearchange dogs may be bearing against the layshaft. Turn the pinion slightly to free the dogs.

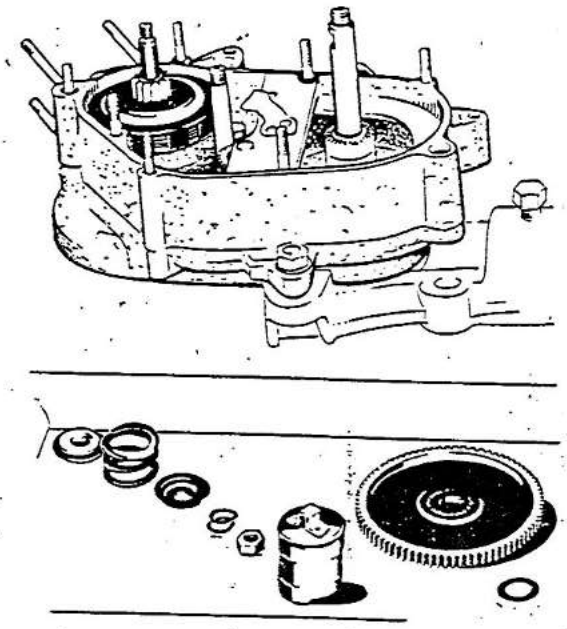


Fig. M 02/20

21. Take off the clutch pinion with the clutch casing, the two lined plates, and the steel plate.

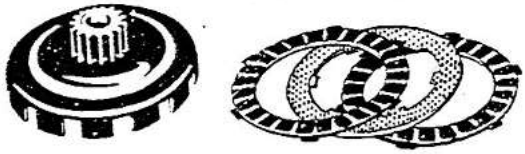


Fig. M 02/21

22. Take the circlip off the left-hand end of the crankshaft, and remove the inner clutch casing with the aid of the levers (16 91 00 908). Remove the rubber sealing ring on the crankshaft by the bearing after the crankshaft has been taken out.

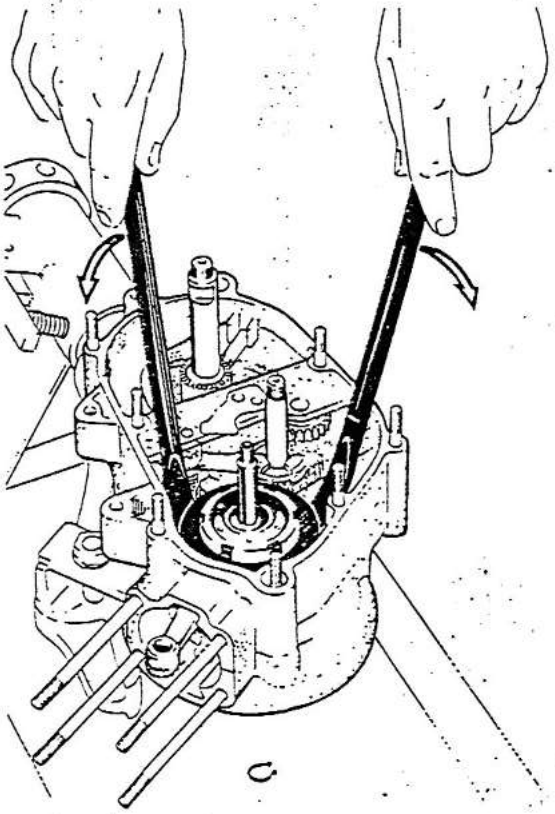


Fig. M 02/22

23. Unscrew the nut and bolt with the two lock washers which are situated roughly in the centre of the crankcase.

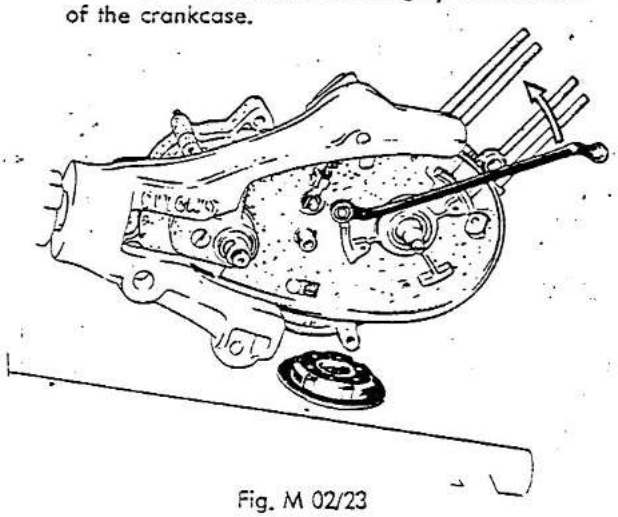


Fig. M 02/23

24. Turn the crankcase so that the left-hand side is uppermost, and take it apart.

25. Take the crankshaft and the gearbox layshaft, together with the thrust washers on either end, out of the right-hand section of the crankcase. Also remove the gearchange fork and its spindle (take the circlip off the fork straight away), the gearchange spring and washer, the driving element together with the sliding spring, the pedal crank spindle with the gear pinion, the gearbox mainshaft with the bottom-gear pinion, and finally the gasket.

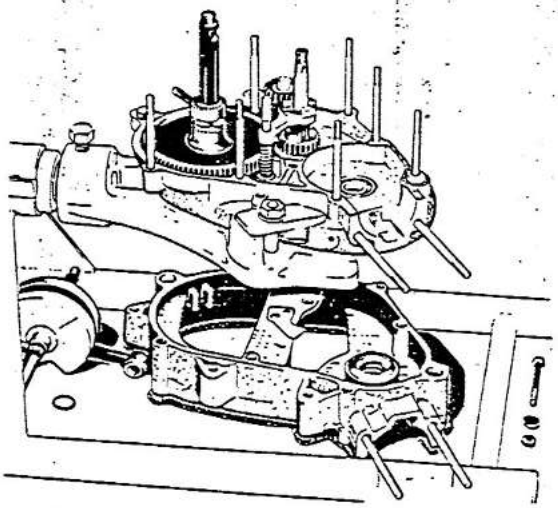


Fig. M 02/24

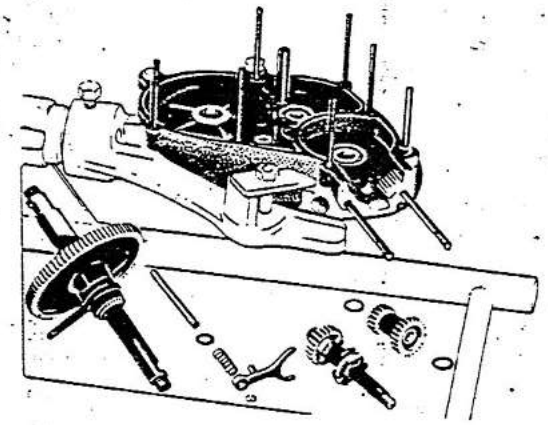


Fig. M 02/25

26. Take the crankcase out of the clamping fixture.

27. Clean and inspect all parts

Assembly of Engine

(M 02)

28. Secure right-hand half crankcase in the clamping fixture with the gearbox side uppermost.

29. Stick the gasket to the crankcase.

30. Measure left-hand and right-hand crankcase sections and the crankshaft and determine the play. The axial play of the crankshaft must not exceed 0.3 mm (0.012 in). The sum of „a" plus „b", less „c", gives the axial play of the crankshaft, „d". If this exceeds 0.2 to 0.3 mm (0.008 to 0.012 in), washers must be placed on the right-hand end of the crankshaft (without serrations) until the play is reduced to this value. The crankshaft is then fitted. It needs hardly be mentioned that all moving parts must be oiled.

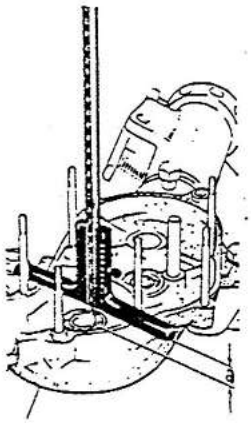


Fig. M 02/30

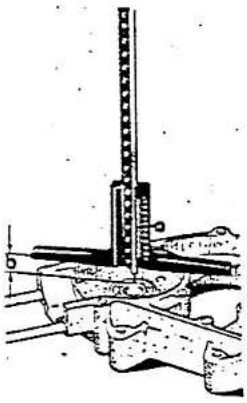


Fig. M 02/30a

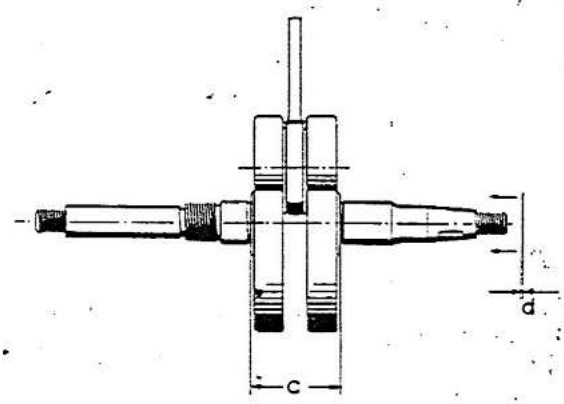


Fig. M 02/30b

a + b — c = d = Axial play

31. Place gearbox mainshaft (98 mm = 3⁷/₈ in long) with bottom gear pinion in right-hand half of crankcase.
Note. The pinion must turn freely on the shaft, and must not bind. (The gearbox mainshaft is now 107 mm = 4⁷/₃₂ in long, and is fitted with 1 bush, 1 thrust ring, and 1 thrust washer.)

32. Insert the gearchange spindle from the right-hand side (outside). Fit the spring, gearchange fork, and dogs. Insert the circlip (gearchange fork side). All these components must move freely. (When fitting the gearchange fork, the lug must point downwards.)

33. Fit pedal crank spindle with gear pinion in the crankcase.

34. Place thrust washer on gearbox mainshaft. Insert layshaft and fit the second thrust washer, 10.2×17×1 mm, or a double-thickness thrust washer 10.2 × 17 × 2 mm.

35. Cover edge of left-hand crankcase with jointing compound, and when fitting it make absolutely certain that it is properly seated. The two fitted sleeves must be placed in the right-hand crankcase section. Place the left-hand crankcase section on top of the right-hand section. Fit a star washer under the head of the bolt used to hold the two sections together, and then pass the bolt from left to right through the holes provided approximately in the centre of the crankcase sections. Fit a star washer and nut, but **screw up only lightly to avoid distorting the crankcase.** (See section 44.) Place the driving element with the sliding spring on the pedal crank spindle, with the narrow end of the driver against the pinion. Place the eye formed on the spring in the recess provided in the left-hand crankcase section.

36. Push the rubber sealing ring over the serrations on the left-hand end of the crankshaft.

37. Fit the inner clutch casing and insert the circlip. Push the clutch casing down with tool (16 91 00 909) and the axle nut, and push the circlip into place in its groove with the aid of a pair of screwdrivers.
Do not hit the clutch casing.

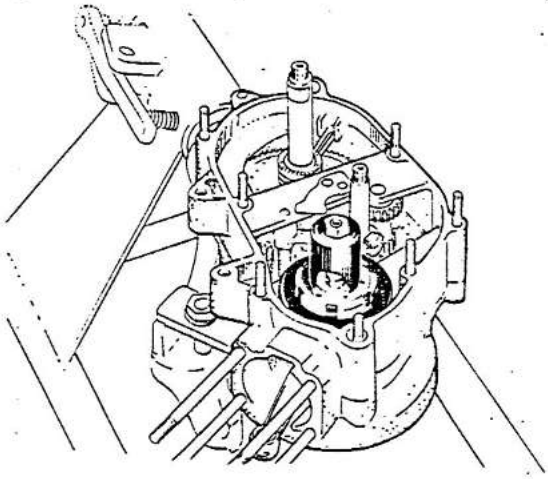


Fig. M 02/37

38. Lay a lined plate, a steel plate, and another lined plate in the clutch casing, and then fit the outer clutch casing.

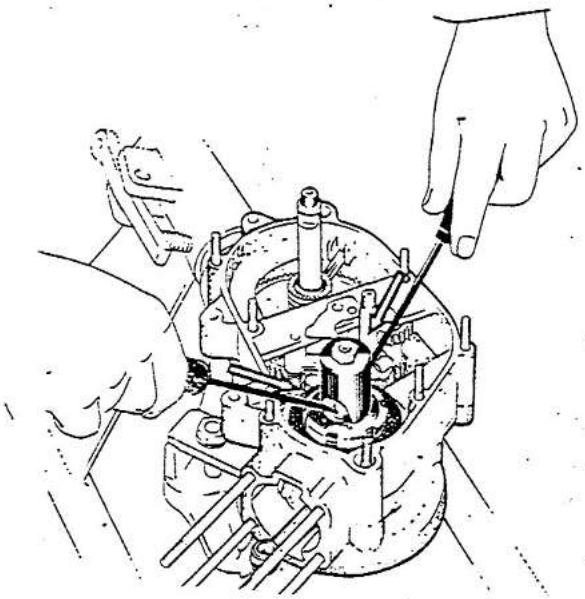


Fig. M 02/37a

39. Push the gear pinion on the gearbox mainshaft. The pinion must be pushed and turned until it slips into place.

40. Lay the thrust washer on the gear pinion. Place the ball bearing carrying the inner spring cup, the clutch spring, and the outer spring cup on the left-hand end of the crankshaft. Compress the spring with the assembly bracket (16 91 00 910), fit two spring washers, and tighten up the nut. Hold the shaft by fitting holder (16 91 00 913) to the gear pinion; tighten the nut up **until the clutch slips.**

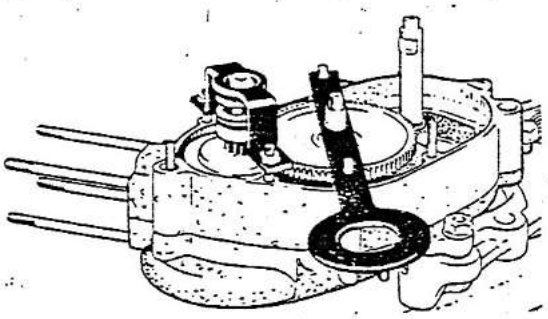


Fig. M 02/40

41. Remove the bracket, and place the clutch-operating cup over the spring and ball bearing. Use a screwdriver to push the circlip into the cup. Then push down the three lugs with a screwdriver to make sure that the circlip is firmly seated. (See Fig. M 02/17.)

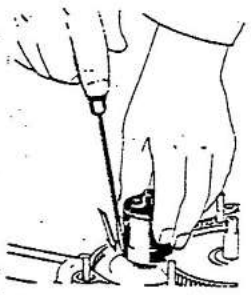


Fig. M 02/41

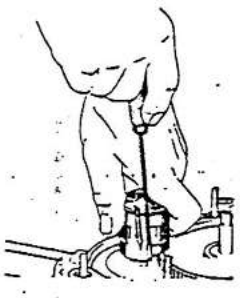


Fig. M 02/41a

42. Stick the gasket to the left-hand crankcase cover with jointing compound.

43. Push in brake actuating sleeve. To prevent the two rubber sealing rings being damaged, the tapered sleeve (16 91 00 906) must be fitted, and the filler piece (16 91 00 905) must be stuck in the groove in the spindle with thick grease.

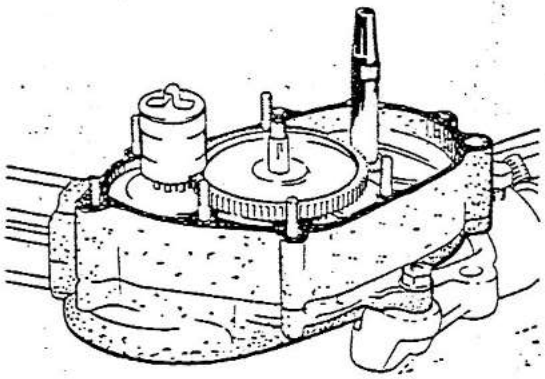
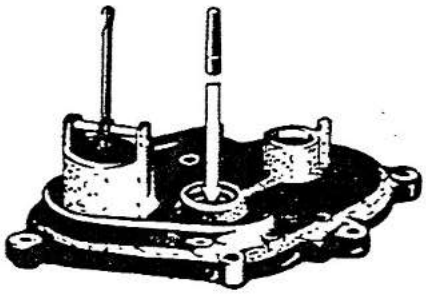


Fig. M 02/43



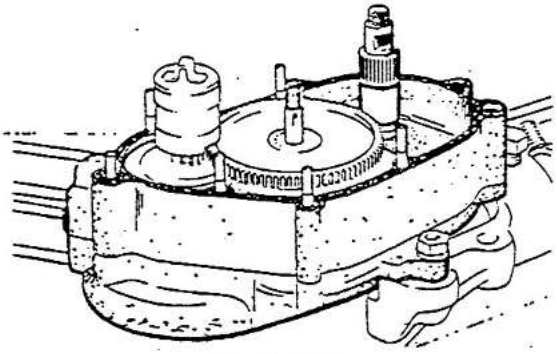


Fig. M 02/43a

44. When fitting the left-hand crankcase cover to the left-hand half of the crankcase, take special care in the case of vehicles later than No. 20 694/ 21 026 that the edge of the sealing ring in the crankcase cover is not damaged by a sharp edge on the modified gearbox mainshaft. The sleeve (018 110 282) should therefore carefully be pushed into the sealing ring from the outside, with its open end leading, until it rests against the ball bearing. Also place both fitted sleeves in the cover, and then fit this slowly on top of the crankcase. The gearbox mainshaft will force out the sleeve (018 110 282). Secure the cover by screwing a nut with two lock washers on each of the 7 studs, and by a hexagon-head bolt with nut and two lock washers. Tighten up the nut on the right-hand side of the crankcase (see section 35).

45. Fit a circlip to the brake actuating sleeve, attach the brake lever with the lug pointing to the right, and then fit a second circlip.

46. Place a spring washer on the gearbox mainshaft, followed by the chain sprocket. Fit 1 rubber sealing ring and 2 spring washers, then screw on the nut and tighten up. Hold the chain sprocket by jamming a rod between the sprocket and the clutch casing. Tighten the nut up firmly. In the latest model the seal is on the shaft and not on the chain sprocket, so that the rubber ring is no longer used.

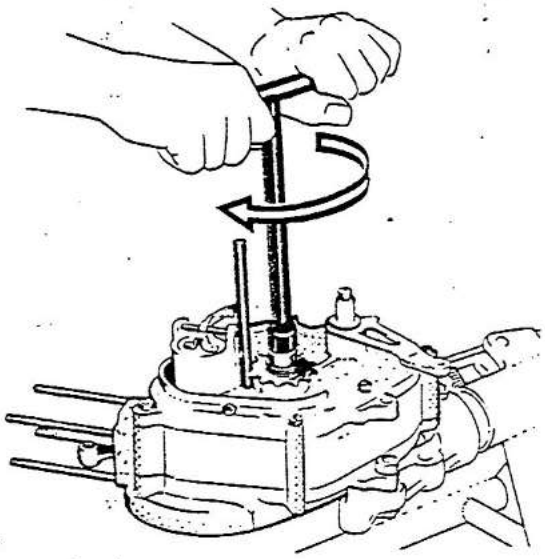


Fig. M 02/46

47. Screw in the oil drain plug.

48. Turn the engine so that the right-hand side is uppermost.

49. Place a washer on the gearchange spindle on top of the lever, and fit a circlip. Check the gearchange mechanism by pushing the top of the lever inwards towards the crankcase (bottom gear). The lever must spring back halfway when released (top gear).

50. Fit the back plate and the ignition cable on the crankcase by means of two cheesehead screws with washers and spring washers. Screw the cheesehead screw and 2 spring washers into the terminal plate. This must be fitted with the cable terminal near the gearchange lever. The felt pad must be greased.

51. Fit the flywheel. Insert 2 spring washers and tighten up nut. Hold flywheel with holder (16 91 00 913).

52. Turn the crankcase so that it is upright.

53. Insert the setting pin (16 91 00 911) in the little-end bearing, and align the connecting rod if necessary.

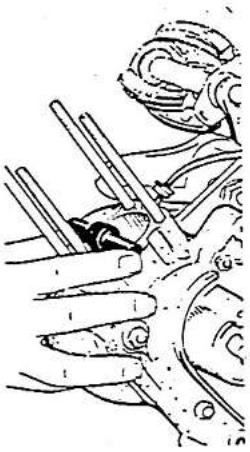


Fig. M 02/53

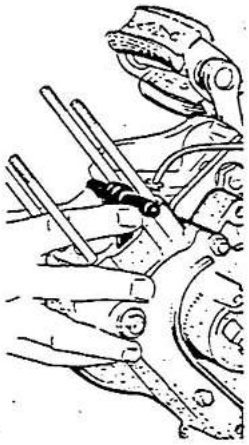


Fig. M 02/53a

54. Place the gasket on the crankcase. Heat the piston up carefully and evenly to a temperature of 120° C (250° F). Insert one circlip and push in the gudgeon pin.
The piston is correctly fitted when the longer edge of the port is at the rear.
A clean cloth should again be placed over the crankcase opening to prevent dirt or foreign bodies falling into the crankcase. Fit the circlip in the piston.

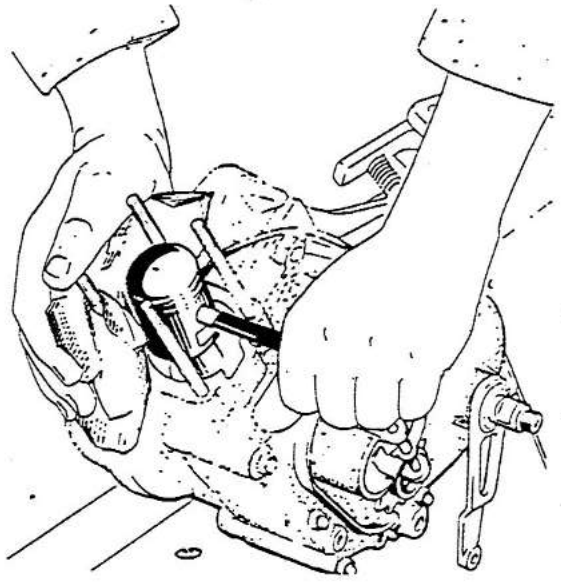


Fig. M 02/54

55. Support the piston on the wooden block. Grip the piston with the piston-ring pliers (16 91 00 907), making certain that the rings fit properly. Carefully push the cylinder over the piston, removing the piston-ring pliers and the wooden block.

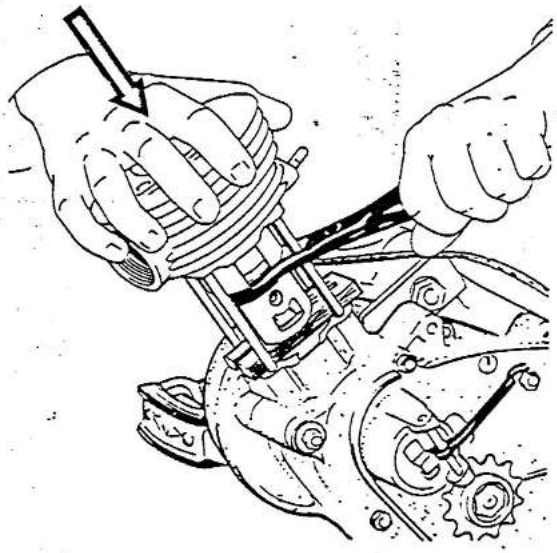


Fig. M 02/55

56. The cylinder is temporarily secured using a pair of spacer tubes to enable the ignition timing to be checked and adjusted as necessary.

57. Time the ignition: contact gap "a" must be 0.2—0.3 mm (0.008 to 0.012 in). Ignition takes place 2.1 mm (0.084 in) before TDC. The break gap of the pole shoe should be 9—12 mm (3/8 to 1/2 in). The arrow on the flywheel shows the direction of rotation; note that the engine turns **anti-clockwise.**

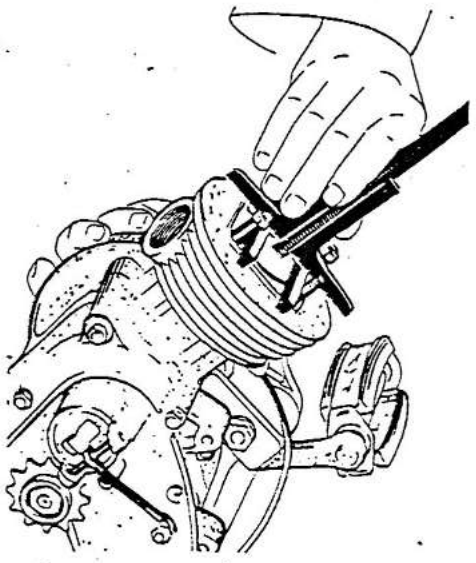


Fig. M 02/57

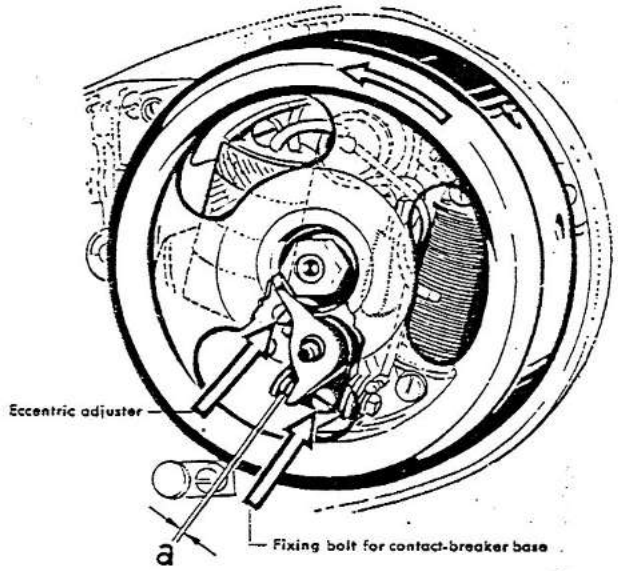


Fig. M 02/57a

a = contact gap 0.2—0.3 mm (0.008 to 0.012 in)

58. Unscrew both hexagon nuts again, and remove the spacer tubes. Fit the cylinder-head gasket. **Make certain opening for decompression passage is not blocked.** Fit cylinder head and tighten nuts.

59. Unscrew oil filler plug on crankcase by right-hand end of pedal crank spindle, and fill with **120 cc (0.21 pint) of SAE 30 oil in summer or SAE 20 oil in winter.** The hole drilled in the front portion of the left-hand crankcase cover plate, in which a slotted bolt is screwed, enables the oil level to be checked. Replace the oil filler plug.

60. **Fit the right-hand crank with pedal first,** pushing it on the spindle and securing it with the cotter pin. **Then fit the left-hand crank,** which is also secured by means of a cotter pin. The two cranks must be displaced by 180°. Note that the left-hand pedal is marked with an „L", an the right-hand pedal with an „R". Screw the nuts on either must be placed against the machined bloss on the special spanner (16 91 00 902).

Note. The nut and washer on the cotter pin must be placed against the machined boss on the pedal crank. The crank spindle must not be turned until both pedal cranks have been firmly secured.

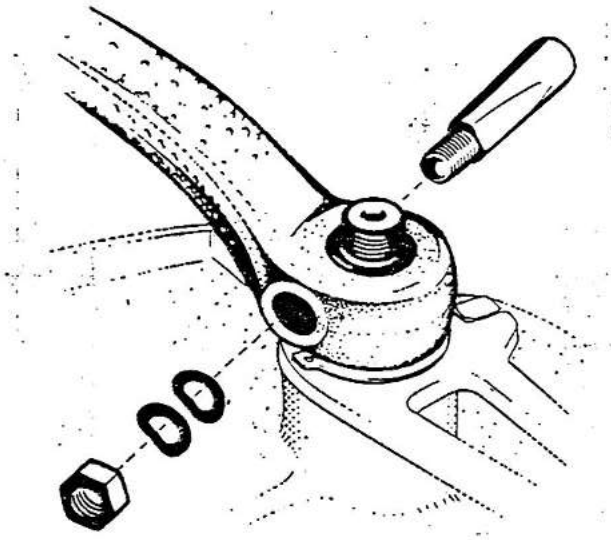


Fig. M 02/60

61. Screw in sparking plug. Push rubber sleeve over ignition cable, fit cap, and place on sparking plug.

62. Take the engine out of the clamping fixture.

Front Wheel - Removal and Fitting

(F 01)

1. Disconnect lower end of front brake cable. Loosen both pinch bolts on the pivoted links. Unscrew nut from pin axle, and knock out axle.

2. Replace in the reverse order. Note that the two spacer rings are placed on the left-hand bearing cone. (If a speedometer is fitted, these two rings are not required).

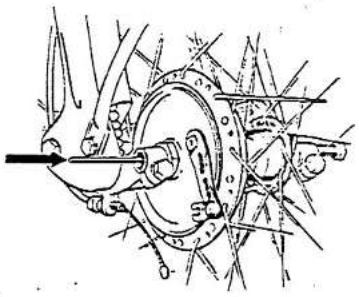


Fig. F 01 c

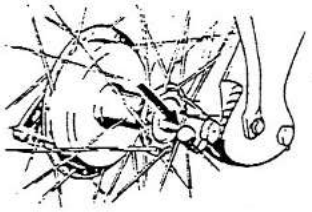


Fig. F 01

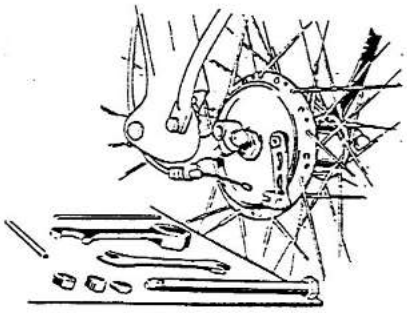


Fig. F 01 d

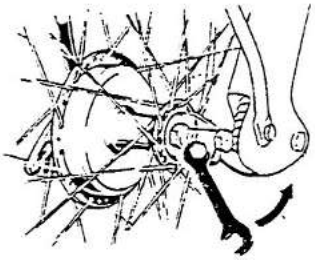


Fig. F 01 a

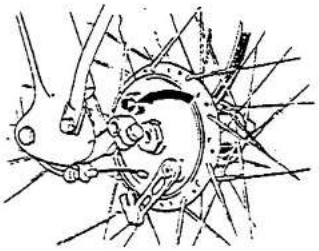


Fig. F 01 e

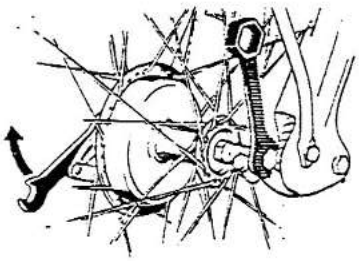


Fig. F 01 b

Rear Wheel - Removal and Fitting

(F 02)

1. Disconnect brake rod from rear-brake cam lever. Unscrew axle nut, and pull out axle. Remove chain from rear chain sprocket (on hub), and drop rear wheel out downwards.

2. Replace in the reverse order. Re-adjust the chain tension by means of the chain adjusters, taking care to see that the rear wheel fits squarely in the forks.

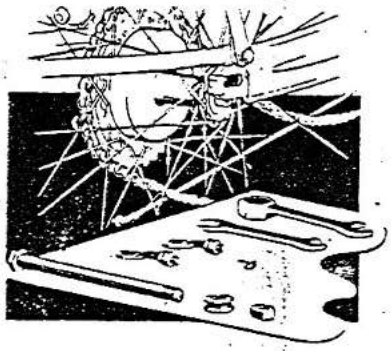


Fig. F 02 b

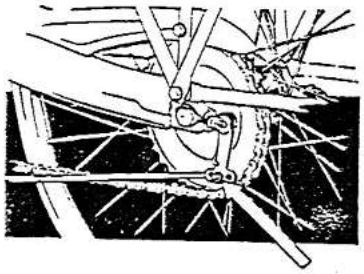


Fig. F 02

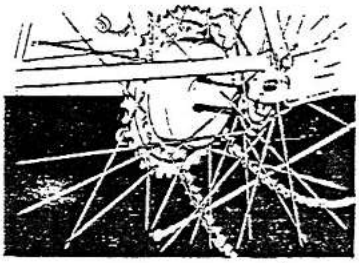


Fig. F 02 c

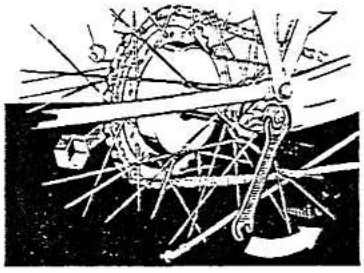


Fig. F 02 a

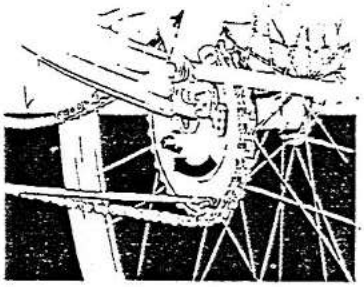


Fig. F 02 d

Ball Bearing Cup or Seal in Hub - Removal and Fitting

(F 03)

1. Remove front wheel (see F 01)
   Remove front brake back plate (see F 04)
   or
   Remove rear wheel (see F 02)
   Remove rear brake back plate (see F 05)

2. Unscrew the left-hand bearing cone (hold with an open-ended spanner), then knock out the complete right-hand cone with a flat punch. Use a normal commercial type of extractor with an expanding sleeve to withdraw the two bearing cups. On the left-hand side the sealing ring will be withdrawn with the bearing cup.

3. Replace in the reverse order,

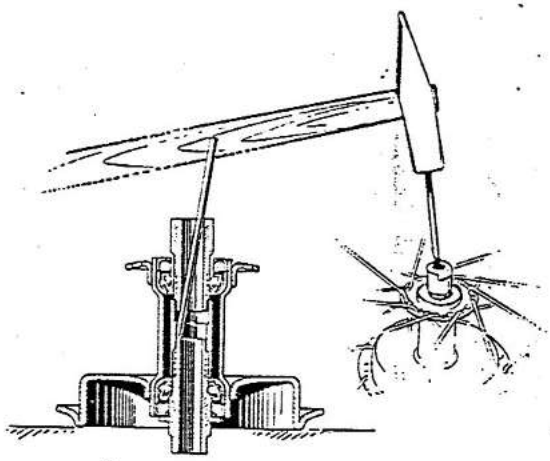


Fig. F 03 a

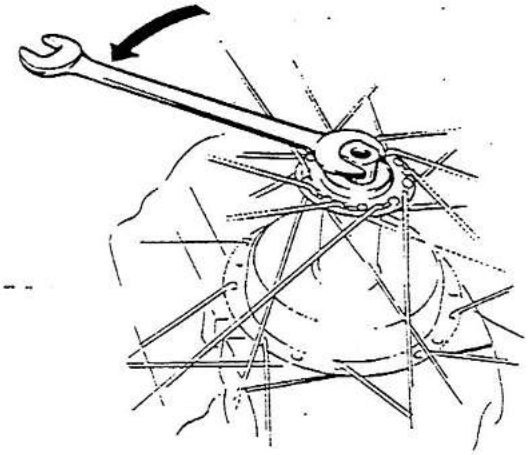


Fig. F 03

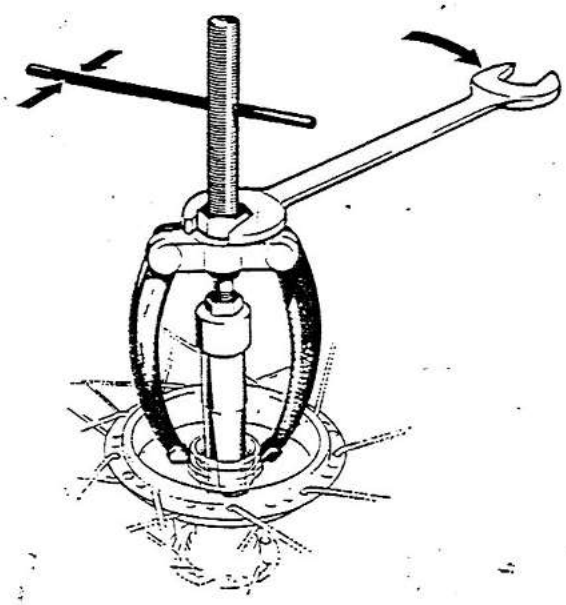


Fig. F 03 b

Front Brake Back Plate - Removal and Fitting

(F 04)

1. Remove front wheel (see F 01)

2. Unscrew hexagon nut on brake back plate (hold by grasping the brake cam lever). Hold the back plate by the brake cam lever, and hit the right-hand bearing cone a few times with a rubber hammer. The brake back plate can then easily be removed.

3. Replace in the reverse order.

Rear Brake Back Plate - Removal and Fitting

(F 05)

1. Remove rear wheel (see F 02)

2. Take circlip out of hub. For remaining operations, see F 04.

3. Replace in the reverse order.

Renew Brake Linings

(F 08)

1. Remove front wheel (see F 01)
   Remove front brake back plate (see F 04)
   or
   Remove rear wheel (see F 02)
   Remove rear brake back plate (see F 05)

2. Disconnect return spring hooked on to brake-cam ends of brake shoes by means of a sharp-nosed pair of pliers. Take off the brake shoes. Cut off the rivet heads on the inside of the brake shoes, and knock the rivets out with a suitable punch. Take off the brake linings.

3. When riveting on the new linings, insert and clench over the central rivets first. Make certain that the brake linings fit properly over the whole of the brake shoes.

4. Fit the brake shoes in the following manner: — Hook one return spring into both brake shoes (pivot end), and hook the second return spring into the left-hand brake shoe. Fit the left-hand brake shoe in place, an then fit the right-hand brake shoe. Hook the other end of the second spring into place in the right-hand brake shoe with a sharp-nosed pair of pliers.

Front Forks - Removal and Fitting

(F 20)

1. Remove front wheel (see F 01)

2. Unscrew knurled bolt, and take off headlamp rim and reflector. Disconnect leads and pull out through rubber grommet together with protective sleeve. Unscrew hexagon cap on fork stem and remove lock washer. Unscrew two hexagon-head bolts with nuts and star washers on the forks and handlebar bracket, and lay the complete handlebars on the tank or frame (place a cloth underneath to prevent damage to the paintwork). Take off the headlamp. Unscrew the lock nut on the fork stem and drop the forks downwards clear of the steering head. Pull the protective sleeve and the two cables out of the forks.

3. If the forks are to be changed, the front mudguard will have to be removed (see F 26).

4. Replace in the reverse order.

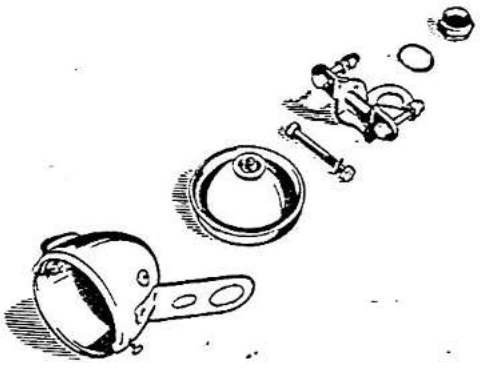


Fig. F 20 a

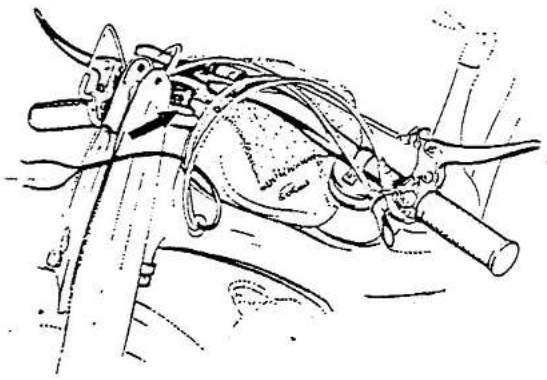


Fig. F 20

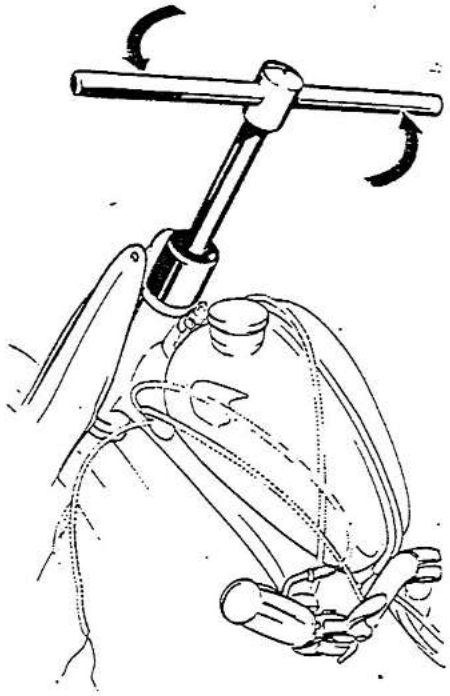


Fig. F 20 b

Steering-Head Cones, Cups, and Balls - Removal and Fitting

(F 21)

1. Remove front wheel (see F 01)
   Remove front forks (see F 20)

2. Take off the cover and the upper steering-head cone with balls, and also the balls out of the lower race. Knock the upper and lower head races out of the steering head with a suitable punch. If the lower cone is to be replaced, it must be forced off the fork stem by hitting it with a flat punch, or must be levered off with a pair of screwdrivers.

3. Assembly: After pressing the lower cone on to the fork stem with a suitable tube and fitting the two head races into the steering head, place 21 balls (5 mm dia.) bedded in grease in each race, and then fit the upper cone and cover. Insert the forks carefully from underneath, and screw on the lock nut. The head bearings should then be adjusted so that there is no play in the forks, but that the weight of the forks (preferably with the front wheel fitted) will prove sufficient to swing them right round to full lock.

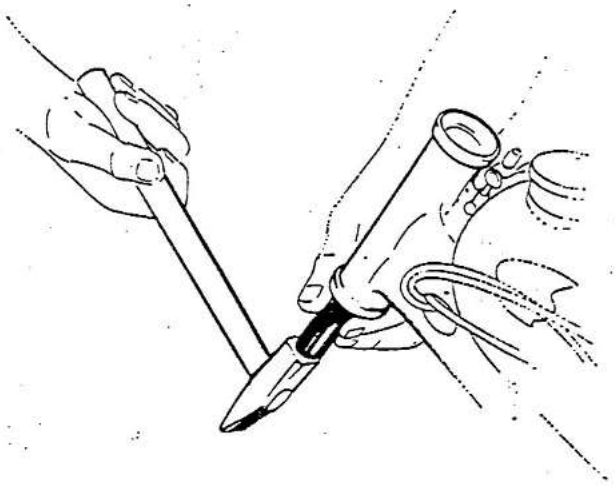


Fig. F 21 b

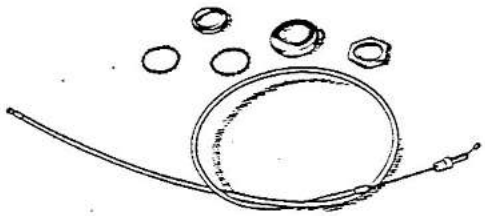


Fig. F 21

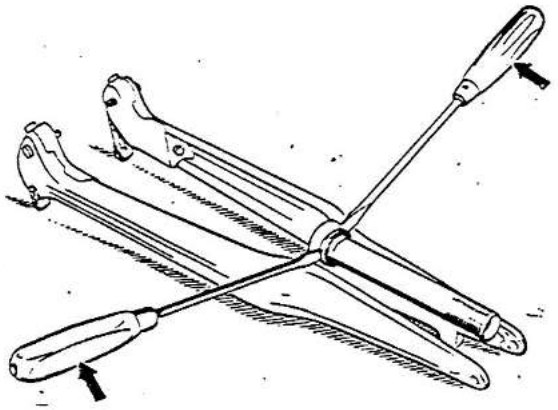


Fig. F 21 c

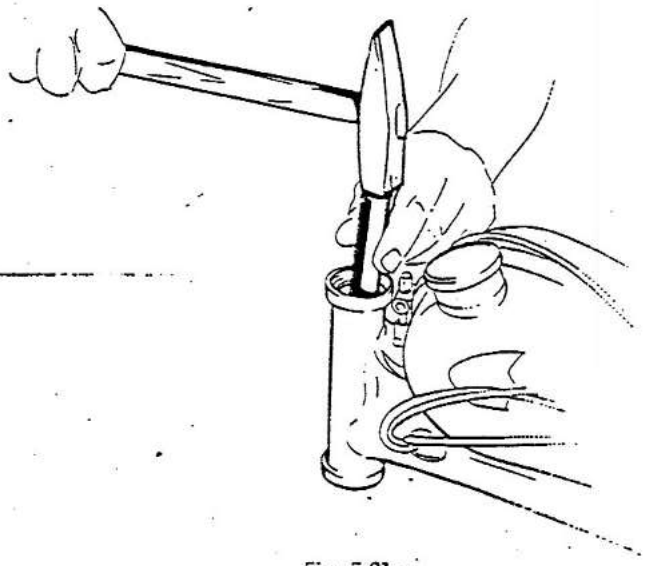


Fig. F 21 a

Pivoted Links (Left-Hand and Right-Hand) - Removal and Fitting

(F 24)

1. Remove front wheel (see F 01)

2. Unscrew nuts on left-hand and right-hand pivot bolts and knock out the bolts. On the right-hand pivoted link unscrew the brake cable adjuster. Unscrew hexagon-head bolts screwed into threaded bushes in ends of fork springs on either side, and take pivoted links with springs out of the forks.

3. Replace in the reverse order. Adjust the brake cable.

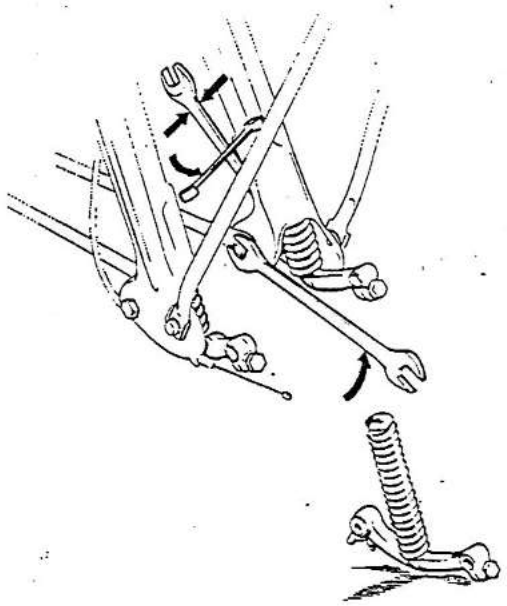


Fig. F 24

Replacing Bushes in Pivoted Links

(F 25)

1. Remove front wheel (see F 01)
   Remove pivoted links (see F 24)

2. Knock out old bearing bushes with a suitable punch and press in new. Ream bush out to 11.02 mm dia., or in the case of machine 122280/131361 and later, fitted with the new pivoted links, to 12.02 mm dia.

3. Replace in the reverse order.

Front Mudguard - Removal and Fitting

(F 26)

1. Remove front wheel (see F 01)

2. Unscrew nut on forks (centre of mudguard). After unscrewing the two hexagon-head bolts with lock washers and self-locking nuts on the forks, the mudguard can be removed.

3. Replace in the reverse order.

CONTROLS AND CABLES

Handlebars (and Fittings) - Removal and Fitting

(F 40)

1. Disconnect clutch, brake, decompression, throttle, and gearchage cables (see F 50, F 51, F 52, F 53, F 54). Unscrew two cap nuts with lock washers from hexagon-head bolts on handlebar clamps. Remove handlebars, bending clamps up as necessary.

2. Replace in the reverse order.

Handlebar Bend - Stripping and Assembly

(F 41)

1. Remove throttle and gearchange twistgrips (see F 40, F 45, F 46).
2. Assemble in the reverse order.

Brake or Clutch Lever - Removal and Fitting

(F 44)

1. Disconnect brake and clutch cables from the levers. Unscrew both 5-mm nuts with spring washers and both pivot bolts from the twistgrip bodies. Take off levers.
2. Replace in the reverse order.

Throttle Twistgrip - Removal and Fitting

(F 45)

1. Push rubber sleeve clear of adjuster. Slacken lock nut on adjuster, and screw cable adjuster on carburetter in as far as possible. Unscrew carburetter cap, and pull cable and throttle slide out of carburetter. Disconnect the cable. Unscrew slotted screw in twistgrip body. Pull complete twistgrip off handlebars. Disconnect cable from twistgrip.
2. If the twistgrip is to be replaced, the front brake cable must be disconnected from the hand lever and the brake cam lever, and the hand lever removed from the twistgrip by unscrewing the nut and the pivot bolt.
3. Replace in the reverse order.

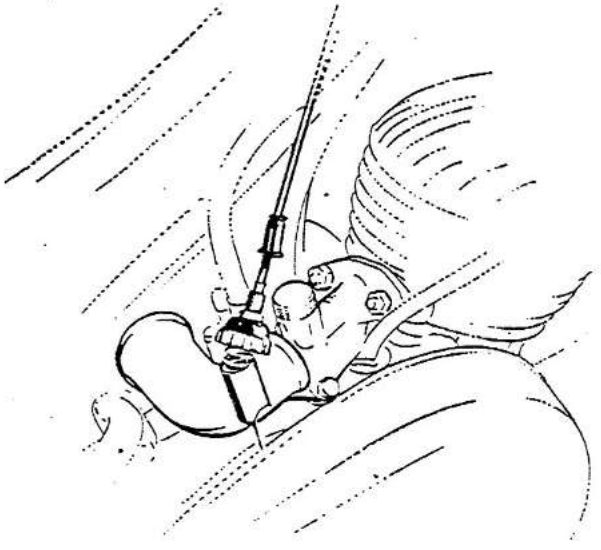


Fig. F 45

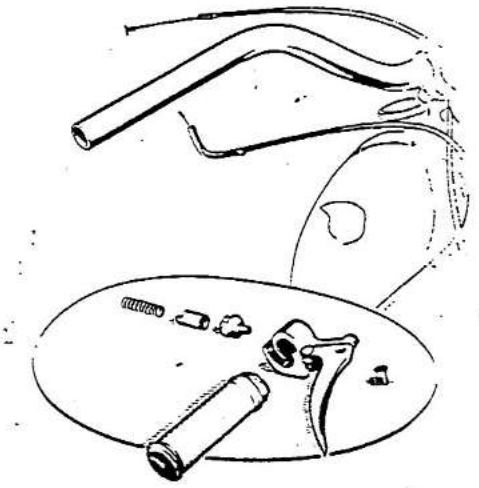


Fig. F 45 a

Gearchange Twistgrip - Removal and Fitting

(F 46)

1. Disconnect decompression cable from valve by lightly pressing thrust plate with a screwdriver. Unscrew slotted screw in twistgrip body, and pull complete twistgrip off handlebars; disconnect gearchange cable. When taking out the nipple, lift the rubber sleeve on the twistgrip slightly with a thin screwdriver.

2. To make certain that the nipple is properly seated on assembly, unscrew the slotted screw and take off the cover from the flywheel magneto.

3. If the gearchange twistgrip is to be replaced, the decompression cable must be disconnected as described in section 1. Unscrew the slotted screw on the decompression lever. Completely unscrew the slotted screw on the twistgrip body, and remove the decompression cable with the lever and bracket. Screw the slotted screw in again. Take off the chainguard. Push the clutch lever in and disconnect the cable; also disconnect the cable from the hand lever on the handlebars. Loosen the lock nut on the adjuster, and unscrew the adjuster on the twistgrip; disconnect the cable. Unscrew the pivot bolt on the twistgrip body and remove the clutch lever. Unscrew the slotted screw on the twistgrip body, and take the complete twistgrip off the handlebars; disconnect the gearchange cable.

4. Replace in the reverse order.

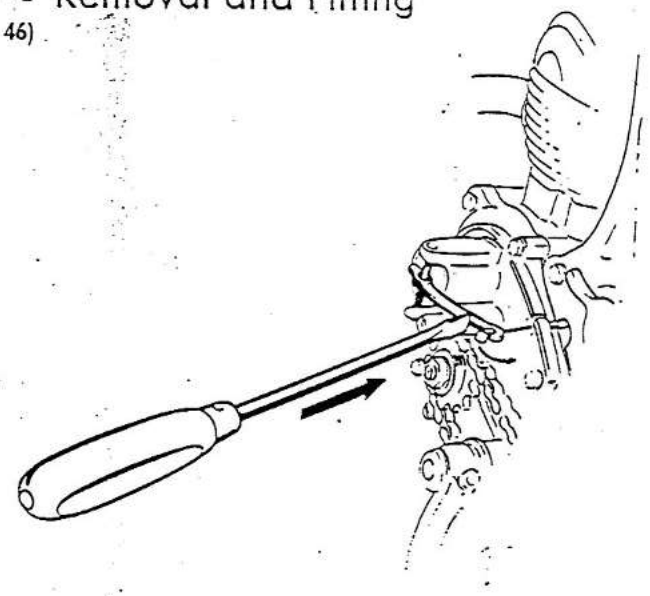


Fig. F 46 a

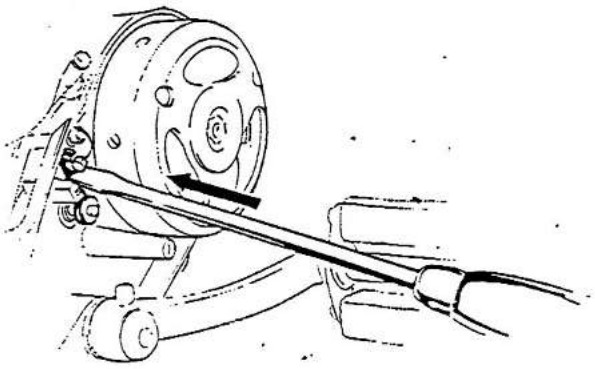


Fig. F 46 b

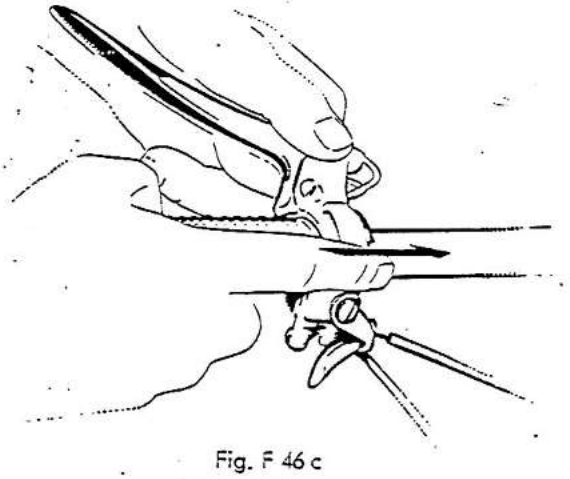


Fig. F 46 c

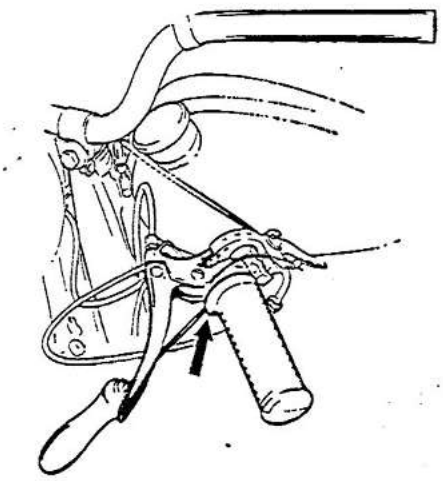


Fig. F 46

5. When removing and fitting the cover for the flywheel magneto, remember that a spacer tube is used. This tube is not required for vehicles after No. 78001/82783.
6. Also remember the spacer tube when removing or fitting the front section of the chainguard. This tube has not been fitted after machine No. 62701/66990.

Sleeve on Twistgrip - Removal and Fitting

(F 47)

1. Push a thin screwdriver a fair distance down between the sleeve and the twistgrip, and lift the sleeve. Squirt petrol between sleeve and twistgrip with an oil can, and pull the sleeve off.
2. Assembly: Moisten the twistgrip with petrol, and push the sleeve on.

Clutch Cable - Removal and Fitting

(F 50)

1. See F 46, section 3.
2. Twist a piece of wire (about 1.5 metres = 5 ft long) round the lower nipple and pull the old cable out in an upward direction. Then twist the wire, which is protruding through the rubber grommet on the frame, round the lower nipple of the new cable, and pull this back through the frame.
3. Assemble in the reverse order (see F 46, section 3).

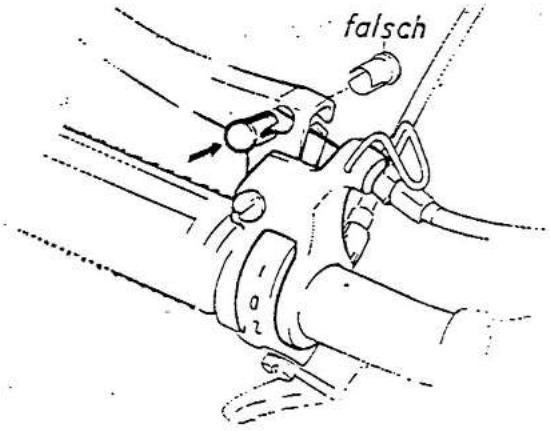


Fig. F 50

falsch = incorrect

Brake Cable - Removal and Fitting

(F 51)

1. Take off chainguard (see M 16)
2. Disconnect nipple at lower end of brake cable. Screw the adjuster out of the right-hand pivoted link. Bend up the cable clip inside the right-hand fork member. Disconnect the cable from the lever on the handlebars, and pull it out downwards.
3. Replace in the reverse order. Do not forget to bend down the clip on the forks.

Decompression Cable - Removal and Fitting

(F 52)

1. Push down the decompression valve with a screwdriver. Take the spring off the thrust plate and disconnect the cable at the cylinder head. Unscrew the set screw in the solderless nipple (upper end of cable), and pull out the cable.

2. Assembly: Secure the upper end of the cable in the solderless nipple (allow the end of the cable to project about 7 mm = 3/8 in). Fit the spring on the thrust plate down by the valve, and push the nipple down into the cylinder head with a screwdriver. There should be about 0.5 to 1.0 mm (0.02 to 0.04 in) play in the cable.

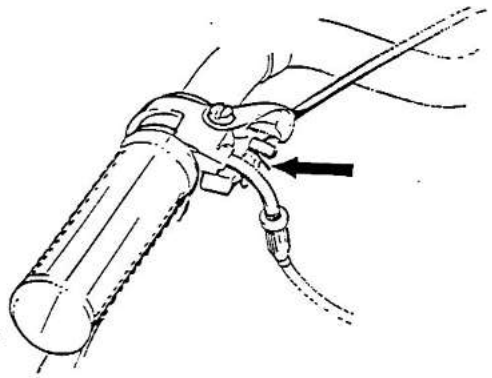


Fig. F 52

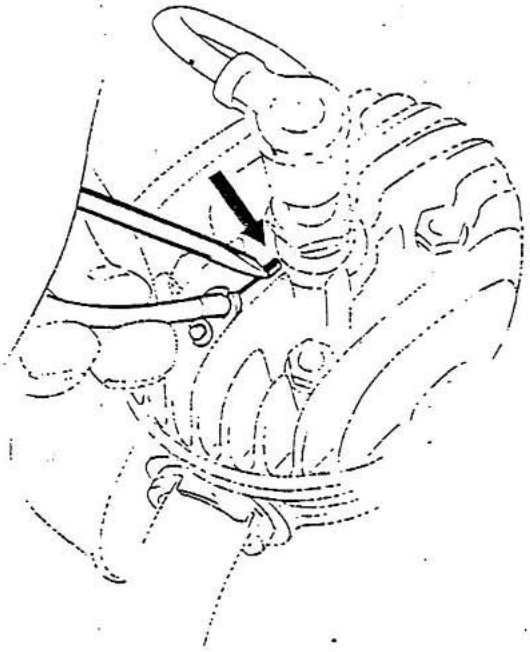


Fig. F. 52 a

Throttle Cable - Removal and Fitting

(F 53)

1. Loosen nut on adjuster, and screw adjuster right in. Unscrew cap from carburetter, and take out cable and throttle slide. Disconnect the cable. Unscrew the slotted screw on the body of the twistgrip. Pull the complete twistgrip off the handlebars, and disconnect the cable from the twistgrip. To take off the cable, loosen the strap holding the fuel tank slightly, so that the cable can be pulled out under the two rubber blocks.

2. Replace in the reverse order.

Gearchange Cable - Removal and Fitting

(F 54)

1. Take cover off flywheel magneto (see M 50).

2. See F 46, sections 1, 2, and 3.

3. Disconnect cable from gearchange lever. Attach a piece of wire (about 1.5 metres = 5 ft long) firmly to the lower nipple, and pull old cable with the wire attached **out in an upward direction.**

4. Assembly: Attach the lower nipple of the new cable to the wire, and pull it **downwards through the frame.** The remaining operations are then carried out in the reverse order. (See F 46, sections 1, 2 and 3).

FRAME

Frame - Removal and Fitting
(F 60)

1. Remove engine (see M 01)
   Remove rear wheel (see F 02)
   Remove luggage carrier (see F 75)
   Remove rear mudguard (see F 62)
   Remove saddle (see F 72)
   Remove fuel tank (see F 80)
   Remove front forks (see F 20)

2. When removing the forks it is advisable to hang the frame up.
   Attach wires to the ends of the leads and cables etc., (as described in F 50 and F 54), and pull these out of the frame when taking off the handlebars.

3. Replace in the reverse order.

Rear Mudguard - Removal and Fitting
(F 62)

1. Remove rear wheel (see F 02)
   Remove luggage carrier (see F 75)
   Remove rear lamp (see E 09)

2. Bend up five clips on the rear mudguard and on the stays, and pull out the lead for the rear light as far as the main frame member. Unscrew the hexagon-head bolt on the rear chainguard and the central stay. Unscrew two hexagon-head bolts with nuts and lock washers on the front mounting (cover plate), and take off mudguard.

3. Replace in the reverse order.

Exhaust System - Removal and Fitting
(F 70)

1. See M 01, section 6.

Pivoted Saddle - Removal and Fitting
(F 72)

1. Loosen the expander bolt a couple of turns. Lay a large screwdriver or a flat bar on the head of the bolt, and hit it with a hammer so that the nut is freed and the saddle can be removed.

2. When fitting the saddle, take care that the saddle column is not pulled out **beyond the marks.** Tighten the expander bolt up well.

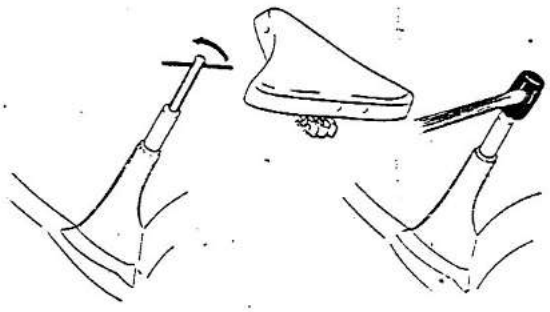


Fig. F 72

Centre Stand - Removal and Fitting
(F 74)

1. See M 01, section 7.

Luggage Carrier - Removal and Fitting
(F 75)

1. Remove tyre pump. Unscrew two hexagon-head bolts with nuts and spring washers from the beam on either side and hexagon-head bolt from top of rear mudguard, and take off luggage carrier.

2. Replace in the reverse order.

Fuel Tank - Removal and Fitting
(F 80)

1. Remove fuel pipe from tap, and unscrew not from strap. Hinge strap up, and take off fuel tank.

2. If a new fuel tank is to be fitted, unscrew the tap and take off cap and seal. Also remove the two rubber blocks. Replace in the reverse order.

3. Replace in the reverse order.

Fuel Tap - Removal and Fitting
(F 82)

1. Unscrew fuel pipe from fuel tap. Lean the machine over to the left and unscrew union nut holding tap tho tank.

2. Replace in the reverse order.

Pedals - Removal and Fitting
(F 85)

1. Left-hand pedal is marked „L" (left-hand thread), and right-hand pedal is marked „R" (right-hand thread). Unscrew pedals with a spanner, and remove.

2. Replace in the reverse order.

ELECTRICAL INSTALLATION

Rear-Light Lead - Removal and Fitting

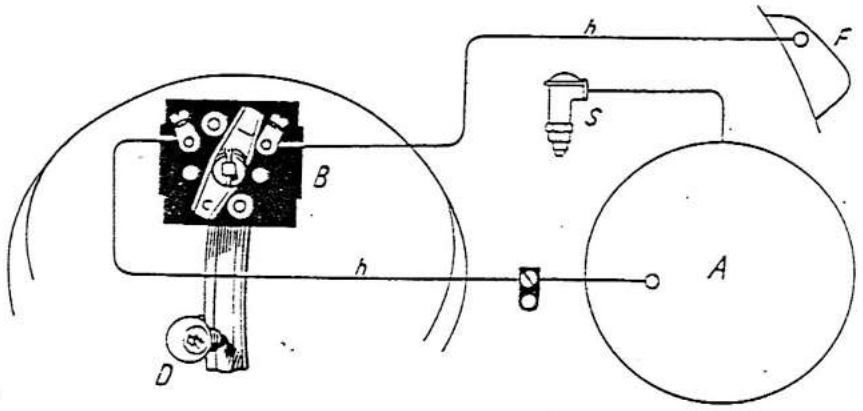
(E 02)

1. Unscrew knurled bolt on headlamp, and take off headlamp rim and reflector. Disconnect both leads, and pull out with the protective sleeve. Unscrew slotted screw on rear lamp, take off cap, disconnect lead, and pull through mudguard. Bend up five clips on rear mudguard and stay, and take lead off as far as frame. Take the cover off the flywheel magneto by unscrewing the slotted screw, and disconnect the lead from the terminal. (It is necessary to disconnect all the leads in this way, since it is difficult to pull one lead on its own through the frame and the protective sleeve.)

2. Firmly twist or solder a piece of wire (about 1.5 metres = 5 ft long) to the lower end of each lead. Pull both leads and the protective sleeve up through the frame and out of the top.

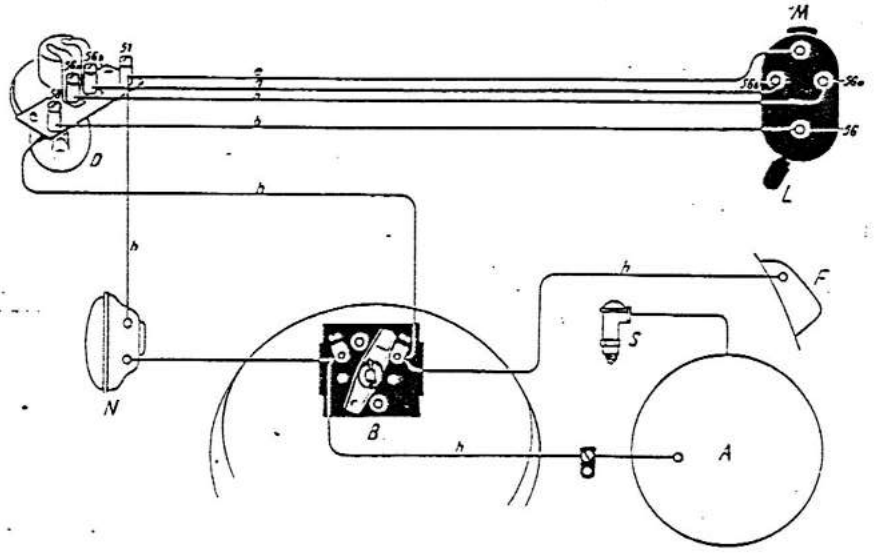
3. Assembly: Connect the new lead to the wire, and pull it through into the frame with the protective sleeve. The remaining operations are then carried out in the reverse order. (The rear-light lead should be connected to the terminal with the red markings in the headlamp).

Wiring Diagram
(3-watt equipment)



A = Flywheel magneto and lighting generator
B = Switch plate
F = Rear lamp
S = Sparking plug
h = grey

Wiring Diagram
(17-watt equipment)
for export only



A = Flywheel magneto and lighting generator
B = Switch plate
D = Double-filament bulb
F = Rear lamp
L = Dipper switch
N = Horn
S = Sparking plug
b = red
e = white
g = green
h = grey

Lighting Leads - Removal and Fitting
(E 04)

1. See E 02.

Rear Light - Removal and Fitting
(E 09)

1. Unscrew slotted screw and take off rear lamp. Disconnect lead. Unscrew nut with lock washer on mudguard, and take off bulb socket.
2. Replace in the reverse order.

Headlamp Glass or Reflector - Removal and Fitting
(E 12)

1. Unscrew knurled bolt on headlamp and take off rim and reflector. Remove three spring clips on reflector, and take off reflector. Take out glass and sealing ring.
2. Replace in the reverse order.

Headlamp - Removal and Fitting
(E 13)

1. Unscrew knurled bolt on headlamp, and take off rim and reflector. Disconnect both leads. Unscrew hexagon cap on fork stem and take off lock washer. Unscrew two hexagon-head bolts with nuts and star washers on forks and handlebar bracket, and lay the complete handlebars on the tank or frame, (place a cloth underneath to prevent damage to the paintwork). Take off the headlamp.
2. Replace in the reverse order.

CARE and MAINTENANCE

Grease vehicle
(W 01)

1. See Instruction Book.

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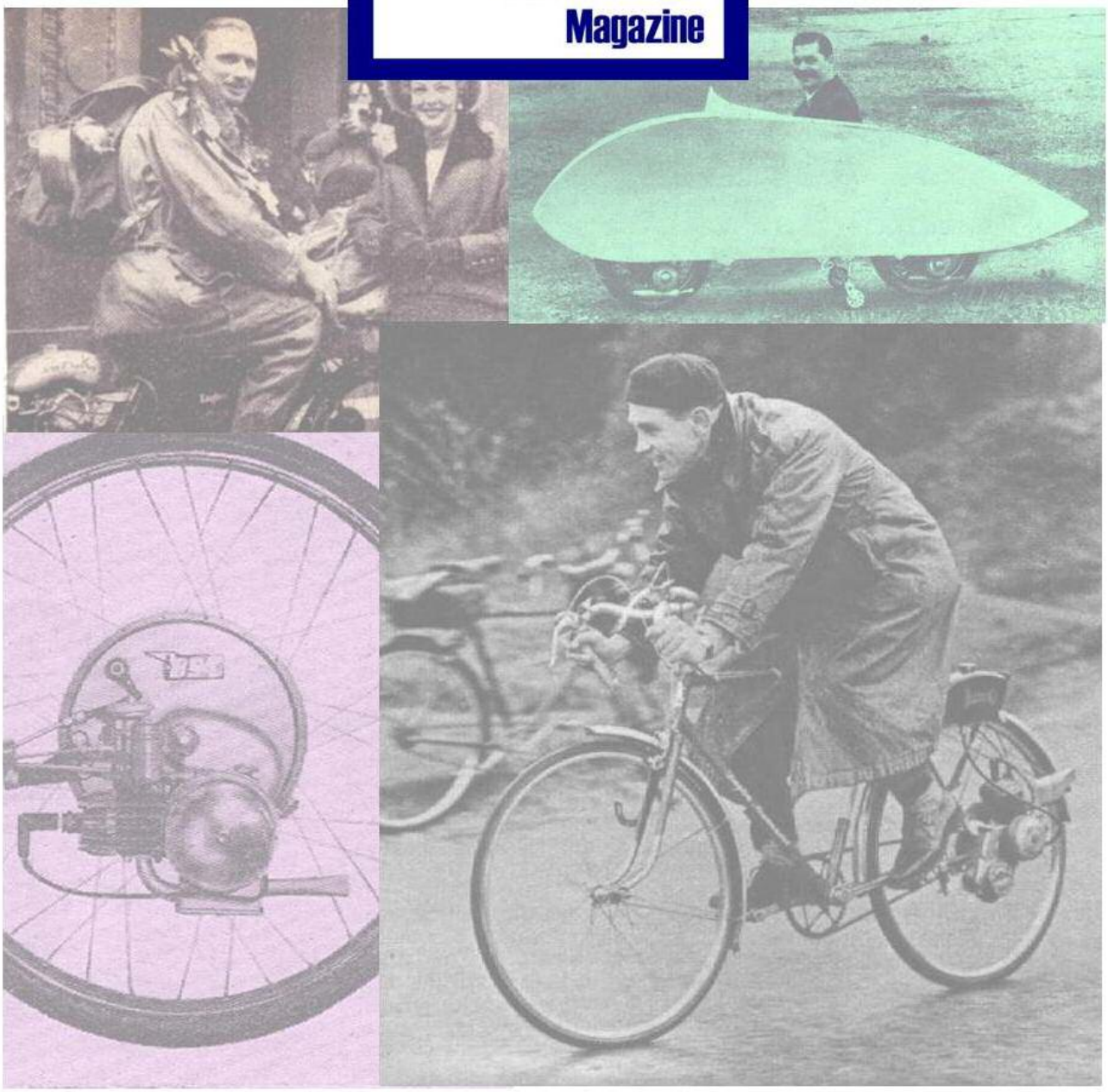

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