PANTHER

DOWTY OLEOMATIC MOTOR CYCLE FORKS

SERVICE AND MAINTENANCE MANUAL

PHELON & MOORE LTD., CLECKHEATON, YORKS

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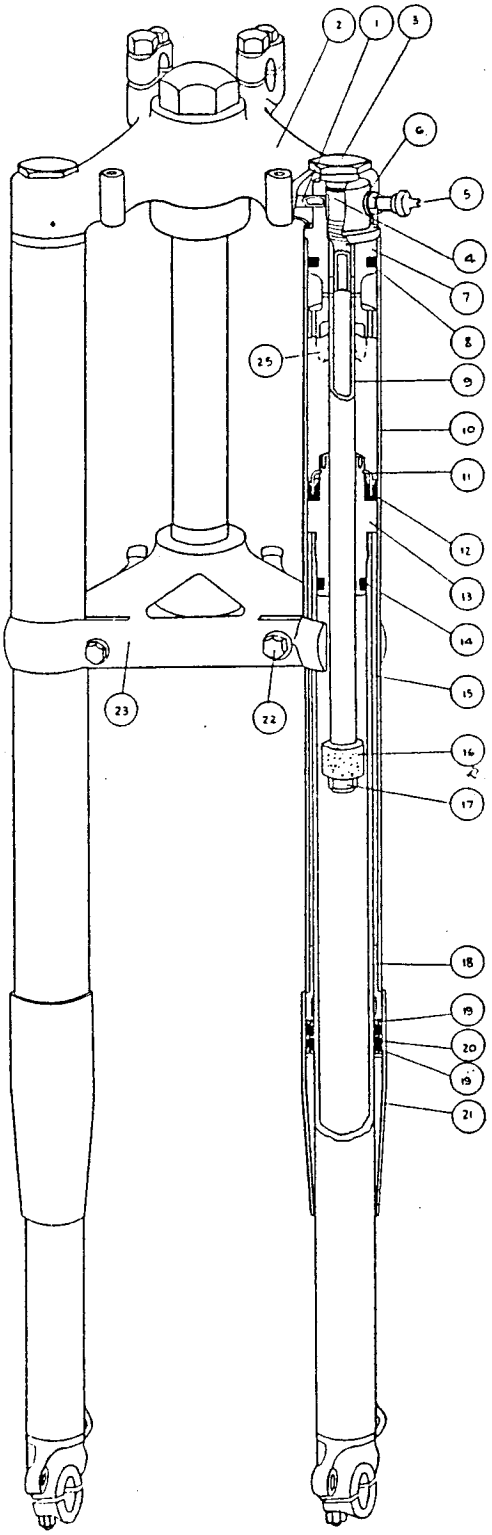
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DESCRIPTION

(see diagram)

1. PIPE, PRESSURE BALANCE.
2. CLIP, HANDLE BAR LUG.
3. PLUG FILLER.
4. STATIC SEAL, FILLER PLUG.
5. VALVE, INFLATION.
6. SEAL, INFLATION VALVE.
7. INTERNAL FITTING TOP.
8. STATIC SEAL, INTERNAL FITTING TOP.
9. TUBE, CARRYING BUFFER.
10. TUBE, OUTER.
11. RING, RETAINING PISTON SEAL.
12. SEAL, PISTON.
13. PISTON.
14. STATIC SEAL, PISTON.
15. TUBE, INNER SLIDING.
16. CUSHION, RUBBER.
17. LOCKNUT, CUSHION.
18. BEARING LOWER.
19. RING, LOCATING SCRAPER.
20. RING, SCRAPER.
21. SHROUD TAPER.
22. BOLT, PINCH.
23. CROWN, FORK FITTING.
24. BOLT, STEERING TUBE PINCH.
25. CUSHION, DASHPOT.

(Not Required on Models 60/70.)

The main members consist of two outer tubes (10), clamped by pinch bolts (22) to the fork crown fitting (23) and attached to the handlebar clip lug (2) by spigots on the top internal fittings (7). A steering tube is brazed into the fork crown fitting and passes through a hole in the handlebar clip lug where it is located by means of a lock nut. A substantial high tensile steel pad bolt prevents rotation of the steering tube relative to the handlebar clip lug.

The axle attachment fittings are brazed into the lower sliding tubes. These vary in design on different machines depending on whether the wheel spindle is fixed or of the 'knock-out' type. The tubes carry light alloy pistons, which are glanded to retain pressure. On Mod. 60/70 forks the piston (13) itself is the upper bearing, its point of application being immediately below the sealing gland. On all Mod. 100 forks the upper bearing is made of 'Mintex' (impregnated asbestos anti-friction material). This bearing is split in two halves so that it may be assembled into a groove in the piston above the gland ring. Synthetic rubber sealing rings (14) below the threaded portion of the piston prevent leakage into the cavity between the inner and outer tubes.

The lower bearings (18) are brazed into the outer tubes and ingress of foreign matter is prevented by double-lipped scraper rings (20) located by tapered shrouds.

Small diameter tubes (9), brazed to the top internal fittings, pass through the piston centres and carry synthetic rubber cushions (16) at their lower ends.

Mod. 100 forks are provided with synthetic rubber dashpot cushions beneath the top internal fittings, whilst in 60/70 models the dashpot is a recess machined into the top internal fitting.

Synthetic rubber seals (8) prevent air leakage from the top internal fittings which are connected by a pressure balance pipe (1).

The inflation valve (5) is fitted to the near-side top internal fitting. It is threaded to fit the normal motor cycle pump connection.

FUNCTION.

The forks are air sprung and oil damped. Air springing has the advantage of allowing considerable deflection for normal surface irregularities whilst maintaining the ability to absorb considerable shocks without excess fork movement.

The movement of the synthetic rubber cushions in oil provides approximately equal and constant damping in both directions without the contact and resultant wear of working parts. These cushions also absorb the shock should the forks extend fully, whilst the oil cushion betwen the pistons and internal top fittings prevents too rapid closing on compression.

INFLATION AND ADJUSTMENT TO LOAD.

A red dot is positioned on the front of each lower sliding tube. When correctly inflated to the load, the bottom edges of the shrouds should coincide with the red dots with rider or riders in position.

To obtain the correct adjustment, over-inflate the fork slightly by removing the inflation valve dust cap and coupling an ordinary tyre pump to the valve. The rider should then sit on the machine, keeping his feet on the footrests and maintaining balance from some convenient support. Air should then be released in small quantities by depressing the stem of the inflation valve until the bottom of the shrouds line up with the red dots. Replace the dust cap on the inflation valve.

It will be seen from the above that the forks can, without fear of error, be correctly adjusted for solo, sidecar, or pillion riding.

INFLATION VALVE.

The inflation valve is fitted with a special core designed to open at low pressure and fitted with oil resisting rubber seatings. *Under no circumstances* should a normal tyre valve insert be used as the action of the oil would rapidly destroy the natural rubber seatings. Dowty Valve Cores can be obtained from your Dealer or direct from the manufacturers.

TOPPING UP.

Topping up becomes necessary only if 'bottoming' occurs in spite of correct inflation. Scrupulous cleanliness is essential.

Remove inflation valve dust cap, depress valve stem and allow all air to escape. The forks will close.

Rest the crank case on a block so that the forks are 1in. from the fully closed position. Unscrew the filler plugs and fill each leg with one of the recommended oils (See 'FILLING'). Replace and tighten filler plugs.

Remove the block from beneath the crank case and depress the inflation valve, thus allowing surplus oil to drain off and the forks to close completely.

Carry out air inflation procedure, adjust to the load, and replace valve dust cap.

FILLING.

Forks are supplied correctly filled and inflated. When filling, it is important that the recommended grade of oil be used as its viscosity does not change appreciably over a wide range of temperatures. Consequently there is little or no alteration in its damping characteristics.

The recommended oils are :—

Mobiloil Arctic	Essolube 30
Castrolite	Motorine D
Single Shell	

The procedure for filling is exactly the same as described under "TOPPING-UP," except that more oil will be required.

Unless dirt has been allowed to enter with the oil during filling or topping up, the oil need never be changed during the life of the machine.

GREASING.

The bottom bearings in each leg should be greased weekly. Six shots with the grease gun should be given to each greaser, situated at the back of the outer tubes, at the lower bearings. Only clean high grade grease should be used. Vent holes are provided in the sides of the outer tubes below the fork crown; these allow surplus grease to escape.

NUTS AND SCREWS.

Periodically check the tightness of all nuts and screws to ensure completely efficient working. It is particularly important that the steering tube pad bolt is really tight, otherwise the fork may become malaligned.

ADJUSTING STEERING HEAD RACE.

Slacken both the clamp bolts on the fork crown fitting and the pad bolt on the handlebar clip plug. Adjust steering head nut as required. Retighten pad bolt hard and clamp bolts on completion of adjustment.

REMOVING AND REPLACING FRONT WHEEL (Fixed Spindle Type).

Place a suitable block under the crank case so that the forks are fully extended and the wheel is clear of the ground. Disconnect the brake cable at the brake drum. Slacken the nuts locating the axle cap on the brake drum side. Screw back the axle nut about two complete turns. Remove both axle caps, supporting the wheel with one hand as it comes clear of the forks.

To replace the wheel, screw up the nuts locating the axle caps to finger tightness only. Tighten the axle nut on the brake drum side so that the wheel is held tightly against the side of the axle fitting. Now tighten axle cap on this side only. Lift the machine off the block and bounce the fork a few times on the ground. Tighten near side axle cap, replace brake cable, and adjust.

The object of the procedure explained in the preceding paragraph is to ensure that the lower tubes of the forks slide freely in the outer tubes. It will be noticed that a small clearance for this purpose is allowed between the shoulder on

the nearside axle ferrule and the axle fitting. With knock-out spindle wheels, the fork should also be bounced before tightening axle nut and clamp bolt to ensure correct alignment.

DISMANTLING FORKS.

In the unlikely event of dismantling or major fork repairs being required, the owner is advised to employ his Dealer to carry out the work, as the changing of sealing rings calls for great care. However, if this course is impracticable and the fork is rapidly losing air pressure, proceed as follows :—

First check the inflation valve for leakage. If there is no evidence of air escaping, the forks will have to be dismantled. An air escape from either piston sealing ring will be indicated first by oil leakage, which will appear at the vent in the outer tube. This will be easily distinguishable from surplus grease.

Place a block under the crank case to allow the forks to extend fully. Remove front wheel as previously described. Remove mudguard stay bolts and detach mudguards. Depress inflation valve stem, allowing all air to escape.

Slacken pinch bolts on the fork crown fitting. Grasp the outer tube firmly with both hands at a point below the fork crown fitting and rotate gently, backwards and forwards, at the same time pulling downwards until the brass ring on the tube is clear of the fitting. The top internal fittings will then be fully exposed. Still holding the outer tube in one hand, push the inner tube upwards until the edge of the shroud is resting on the axle fitting, exposing the piston.

Grasp the axle fitting firmly and engage a peg spanner in the holes in the top of the piston. (The spanner for this purpose may be obtained from your Dealer.) Unscrew the piston and gently withdraw the inner and outer tubes together, leaving the piston on the central stop tube. Slide the outer tube off the inner tube and remove screws and greaser from the shroud. Withdraw the shroud, together with the rubber locating and scraper rings. Empty the oil from the tube.

Remove the lock nut and washer at the end of the stop tube, at the same time taking care not to bend the tube. The complete piston may now be removed. On Mod. 100 forks the two halves of the 'Mintex' bearing are now detached, allowing the gland ring and metal spacer to be withdrawn. On 60/70 models the steel circlip at the top of the piston must be removed before the gland ring and spacer may be withdrawn.

Exactly the same procedure is repeated with the other leg of the forks.

Wash all parts in clean paraffin. Do not dry the parts with a cloth as however clean it may appear there is always the probability of small particles of grit adhering to it.

Examine carefully the lips of the piston sealing rings and if they are chipped, however slightly, they must be replaced. If there is evidence of extensive or deep scoring in either outer tube, it should be replaced. Such scoring is caused invariably by dirt being introduced into the fork during filling or topping up, so the importance of cleanliness will be realised. Scoring cannot occur in normal usage and even after many thousands of miles have been covered the tubes will retain their original polished appearance.

It will be noted that the working portion of the forks may be dismantled without removing the fork crown or handlebar clip lug from the machine. Thus it is not necessary to disturb the steering head race adjustment or the balance pipe unit.

REASSEMBLING FORKS.

Insert the rubber scraper ring into the top of the shroud with the longer lip of the ring downwards towards the axle fitting. Place the soft rubber locating ring over the scraper ring, sliding the shroud over the inner sliding tube. Introduce the outer tube over the inner tube and slide the shroud into position, locating it by replacing the screws and greaser. Place new gland ring and spacer in position on the piston and locate with 'Mintex' bearing or circlip according to type of fork. Smear the diameter of the ring with good quality lubricating grease. The static rubber sealing rings at the threaded end of the piston should be similarly treated. Replace the piston in position on the centre tube and attach the rubber out-stop, washer, and locknut. Smear a little grease around the static sealing ring on the top internal fitting.

Fill the inner tube with one of the recommended brands of oil. Hold the outer and inner tubes by the axle fitting, pass them up through hole in fork crown fitting, and screw in the piston with the peg spanner. Take care, during this operation, that the lip of the piston sealing ring is not damaged on the edge of the hole in the fork crown fitting.

Gently force the outer tube upwards until the top edge butts on the flange of the top internal fitting. Rotate the tube so that the vent hole faces outwards. Proceed in the same manner with the alternate leg, finally tightening pinch bolts and replacing mudguard and wheel. Topping up and inflation to load completes the operation.

TOOLS REQUIRED FOR DISMANTLING.

1. Pliers.
2. Screwdriver.
3. Adjustable Spanner.
4. Peg Spanner (for dismantling piston).
5. Circlip Pliers (Mods. 60/70 only).