A70

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May 1989

(Superseding AP 104B-0801-13 dated Aug 71)

MAIN UNDERCARRIAGE LEG

MESSIER PART NUMBERS

C22093-2	C22093-10-2
C22093-3	C22093-1003
C22093-4	C22093-1004
C22093-5	C22093-1005
C22093-6	C22093-1006
C22093-106	C22093-2006

GENERAL AND TECHNICAL INFORMATION
PARTS CATALOGUE AND RELATED INFORMATION
REPAIR AND RECONDITIONING INSTRUCTIONS

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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NOTES TO READERS

1. This publication incorporates Messier Hispano Bugatti Manual 32-11-22 in its entirety.

2. The publication will contain material from various sources ie the prime contractor and secondary contractor. Material from the prime contractor will comply with AvP 70 specifications. Secondary contractors material will consist of Civil Airworthiness specifications or BCARs, this information may have pages identified by either Revision states or Amendment states or both.

3. To enable recipients to amend their publications the following information will apply.

   (a) The AIS will give instructions for the incorporation of any preliminary matter of Annexes which may be applicable.

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   (c) Recording instructions are to be carried out as detailed on the AIS and Vendor's Letter of Transmittal.

4. Messier Hispano Bugatti Overhaul manual 32-11-22 incorporates auxiliary pages which transmit amendments to the original text. Information explaining the use and applicability of auxiliary pages is contained in the Foreword to Overhaul Manual 32-11-22.

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OVERHAUL MANUAL

WITH

ILLUSTRATED PARTS LIST

REAR UNDERCARRIAGE LEGS (LEFT AND RIGHT)

PART NUMBERS

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FOREWORD

1. General Instructions

This manual is intended for the guidance of the personnel responsible for the shop overhaul of components after their removal. These components are manufactured by MESSIER-HISPANO-BUGATTI (France).

It provides a general description of the component concerned, explains its operation, and gives specific instructions and information concerning the work to be carried out for its overhaul, repair, testing and return to service. The values given for torque loadings, tolerances and clearances are to be strictly adhered to.

This manual has been compiled in accordance with Specification ATA 100 of the AIR TRANSPORT ASSOCIATION OF AMERICA. It is identified by a number which appears at the foot of each page, consisting of three groups of digits separated by a dash :

- the first group of digits indicates the system)
- the second group of digits indicates the section) aircraft breakdown
- the third group of digits indicates the subject)

The "System" and "Section" numbers indicate the part to which the particular component belongs. The "Subject" number is chosen by the manufacturer to suit the required classification. This number may consist of one, two, three or four digits.

The documentation concerning each subject in this manual is divided up into chapters, which are sufficiently short to make for easy reference. The subjects are listed in the table of contents, in conjunction with the list of effective pages.

2. Particular Instructions

The following text describes the various methods of incorporating in the Overhaul Manuals the amendments which arise due to modifications applied to the relevant components, taking into account the range of applicability of such modifications.

A. Modification applicable to all components (delivered or in course of manufacture)

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In this case, the description and overhaul of the particular component refers to its latest standard. Usually, such a modification involves a change of Part Number. The former figures and text are replaced by those which are valid for the latest standard of the component.

It should be noted that the actual application of the modification to the component concerned is carried out by the users by reference to Service Bulletins or similar documents, issued separately and as rapidly as possible.

B. Modification applicable to a certain number of components

(1) If the modification(s) does/do not affect the Part Number of the component(s), new versions are not generated. Parts variants are shown in the Parts List(s) (for example : parts which derive from others due to a lightening modification, parts to be used for new manufacture only). The references of these parts are usually followed by the letter A, B, etc. The reference which is followed by the latest letter in the alphabet corresponds to the part which is at the latest standard. Where applicable, the text and the figures will indicate the differences due to parts variants.

(2) If the modification(s) does/do cause a change of Part Number of the component(s), the new version(s) of the component(s) must be added to the manual (for example : A10-24000 - A20-24000 or A20-24000-1). Each version of the component will have its own complete Parts List. All that has been said in B (1) concerning parts variants remains applicable in this case. The figures will remain common to all versions when the differences between them can be distinguished by means of detail views. Where such differentiation is difficult, each variant of the component will be allocated as many special figures as are required.

The parts of the text which are amended for reasons other than the addition of parts variants will be covered by auxiliary pages. Each auxiliary page will be inserted opposite the page it modifies and will bear the same number, except that it will be followed by bis, ter, etc. For example, an odd-numbered page bis, ter, etc will occupy the position of an even-numbered page, and an even-numbered page bis, ter, etc will occupy the position of an odd-numbered page.

NOTE 1 : If an important paragraph has to be incorporated in a page other than the last one in the chapter (for example : page 103 followed by pages 104, 105 and 106), one or more pages may be inserted between pages 103 and 104. Such pages will be numbered 103a (even-numbered page), 103b (odd-numbered page), 103c (even-numbered page), etc. If one page only is sufficient for the incorporation of the given paragraph, this page will be numbered 103 a-b.

NOTE 2 : The application of the procedure for pages bis, ter, etc means that, in the same manual, it is possible to find pages x bis a, x ter a-b, or x a bis, x a-b ter.

The use of so many indices can, however, make the manual difficult to follow, and their use must be restricted to exceptional circumstances. Their application to Parts Lists has been avoided as much as possible.

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REAR UNDERCARRIAGE LEGS
(LH AND RH)
C22093-1006 (Amendment D)

DESCRIPTION AND OPERATION

1. Description

A. General

The leg type C22093-1006 differs from type C22093-6 solely with regard to the double locking, which affects the following:

- the outer hinge points of the torque arms.
- the middle hinge point of the torque arms.
- the wheel attachments.

REAR UNDERCARRIAGE LEGS
(LH AND RH)
C22093-6 (Amendment D)

DESCRIPTION AND OPERATION

1. Description

A. General (see figure 1)

The rear undercarriage legs are identical, interchangeable, and rearward retracting.

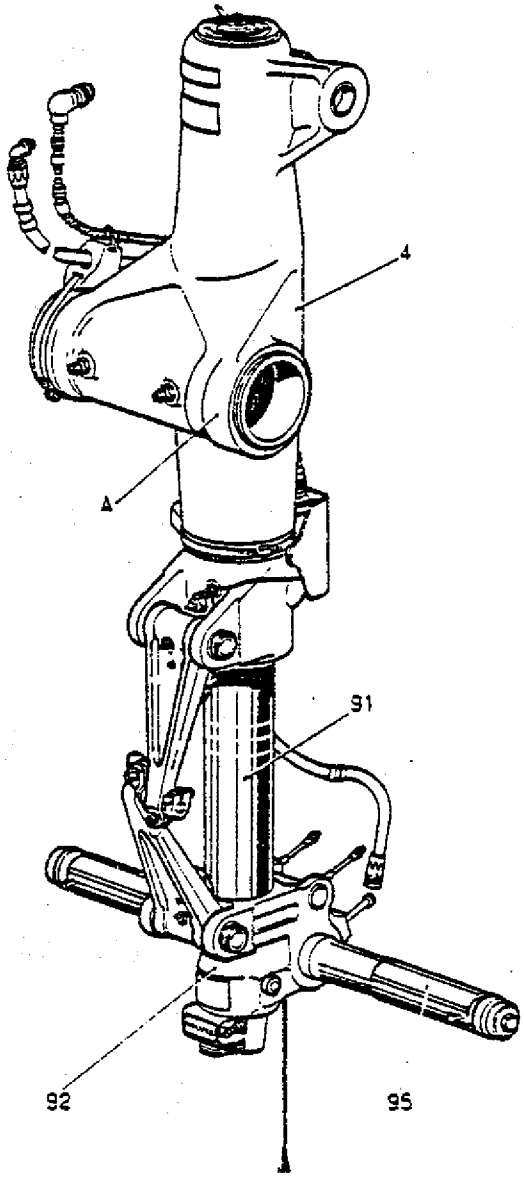
Each leg includes a built-in oleo-pneumatic shock absorber.

The axle (95) carries two twin-mounted wheels, located one on either side of the axle pot (92).

A hydraulically-operated double brake, for braking the wheels, can be fitted to the axle pot.

B. Characteristics

Weight.....	21,270 kg (46.892 lb)
Operating fluid..... (Fluid chamber filling and gas chamber level adjustment)	AIR 3520 (MIL-H-5606B)
Inflation pressures	
- LP chamber.....	16,6 bars (241 p.s.i)
- HP chamber.....	133 bars (1920 p.s.i)
Between-centre distance (from wheel centre-line to centre-line of pivot pin in structure), with shock absorber extended	0,645 m (25.392 in)
Compression stroke :	
- under static load.....	0,155 m (6.101 in)
- maximum.....	0,250 m (9.842 in)



Rear undercarriage legs
Figure 1

Connection to be used on the helicopter for fitting the brake supply pipe..... M10 x 1 annular connection to BNAe Standard.

C. Description (see figures 1 to 5)

The rear undercarriage legs consist of two main parts :

- the barrel (4)
- the sliding rod (91).

(1) The barrel (4) is attached to the structure by means of a pin, on which it can pivot, through a bearing (A), equipped with bushings (8) and (9). (See figure 1, figure 2 - detail C and figure 3 - section dd).

It is fitted externally with a switch (57), equipped with a protective cover (64). This switch provides an indication of the condition of the leg (compressed or extended). (See figure 1, and figure 3 - detail E and section ff).

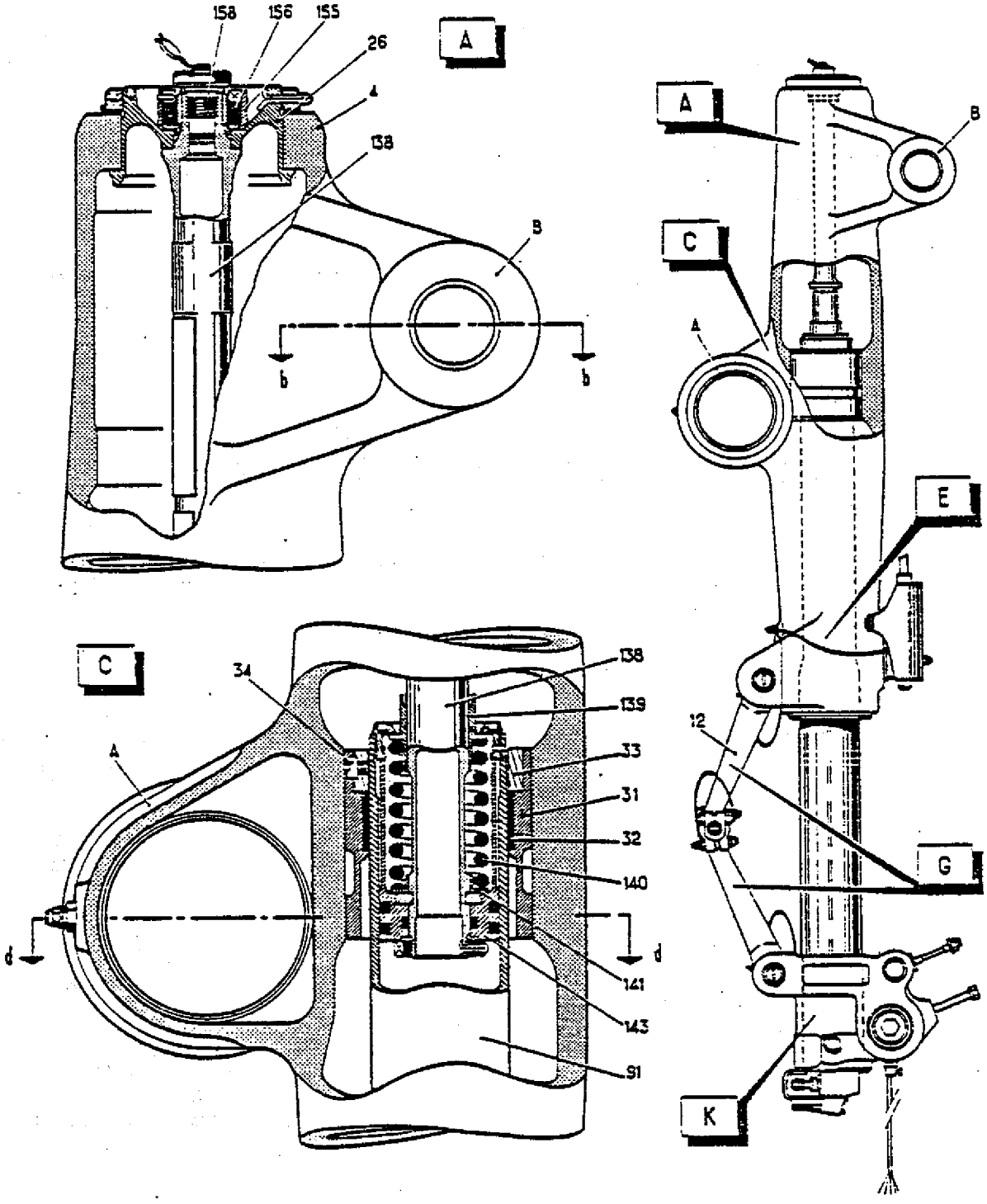
A pair of lugs (B), equipped with bushings (5) and machined from the upper part of the barrel, forms the attachment and pivot point for the rod of the stay jack. (See figure 1, figure 2 - detail A and figure 3 - section bb).

In addition to the switch (57), the barrel has on its lower part a pair of lugs which forms the attachment and pivot point for one torque arm (12). (See figure 1, figure 2, and figure 3 - detail E).

(a) The column (138) is attached to the upper part of the barrel (4) by means of the base (26), the cup (155) and the nut (156).

The upper part of the column (138) has a tapped hole, for the connection of the shock absorber filling device. This hole is normally closed off by a plug (158). (See figure 2 - detail A).

To the column are fitted the piston (143), the cup (141) and the spring (140), together with the guide (139), which is able to slide along it. (See figure 2 - detail C).



Rear undercarriage legs
Figure 2

(b) Midway along it, the barrel (4) is fitted internally with a cage (31), which is fixed to it both rotationally and longitudinally by a pin (35). This cage contains a guide (32), secured by a bushing (33) and a screw (34). The complete assembly forms a guide for the sliding rod (91). (See figure 2 - detail C and figure 3 - section dd).

(c) At its lower part, the barrel is fitted with a ball joint bearing, formed by a cage (39) and a ball (40). The cage (39) is fixed to the barrel rotationally and longitudinally by means of a pin (42) and a base (47).

The bearing is lubricated by means of a grease nipple (45), fitted to the pin (42). (See figure 3 - detail E).

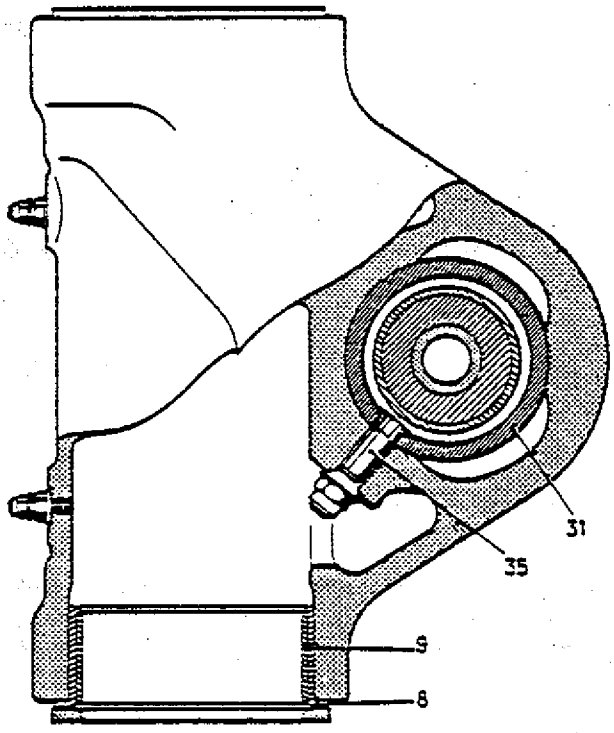
(d) The switch (57) is operated by the sliding rod (91), through a roller carrier (48) and a roller (49). (See figure 3 - detail E and section ff).

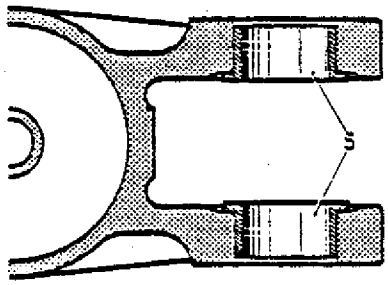
(2) The sliding rod forms the shock absorber cylinder and moves within the barrel (4) on its ball joint bearing (See figure 3 - detail E) and in the guide (32), (see figure 2 - detail C).

(a) The spring (140) bears against the cup (141) and the guide (139) (see figure 2 - detail C). Its function is to limit oscillatory movement of the helicopter about the roll axis, when the shock absorbers are close to their fully-extended conditions.

(b) The restrictor (120) is fixed to a shoulder within the sliding rod (91) by means of a nut (128) locked by a screw (129). (See figure 3 - detail E).

The spool (125) is contained inside the restrictor (120), sliding within the cylinder (124) and normally held against it by the spring (122). (See figure 3 - detail E).





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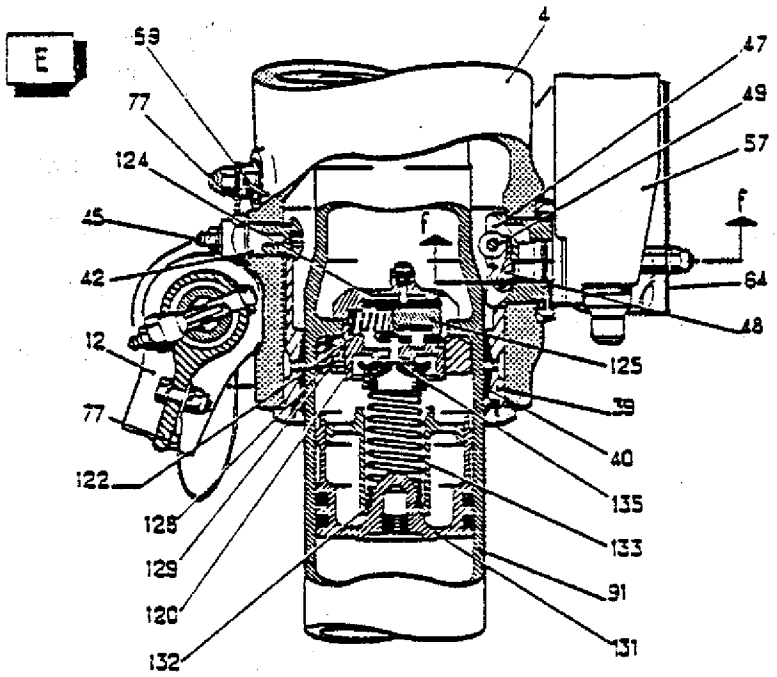
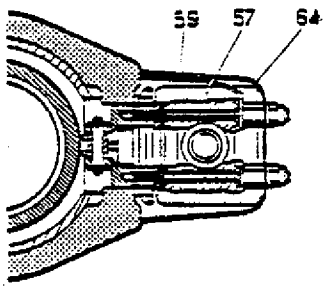
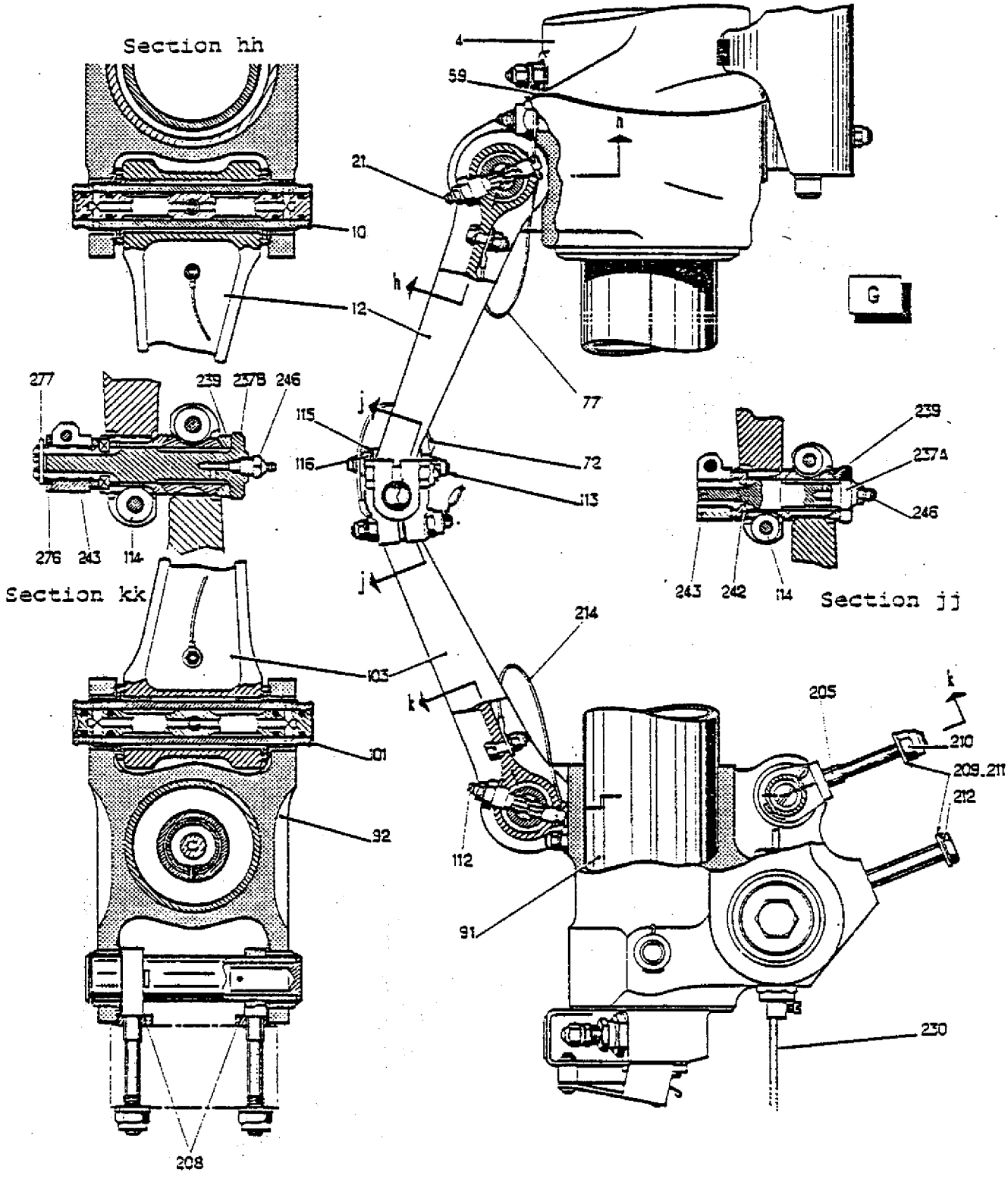


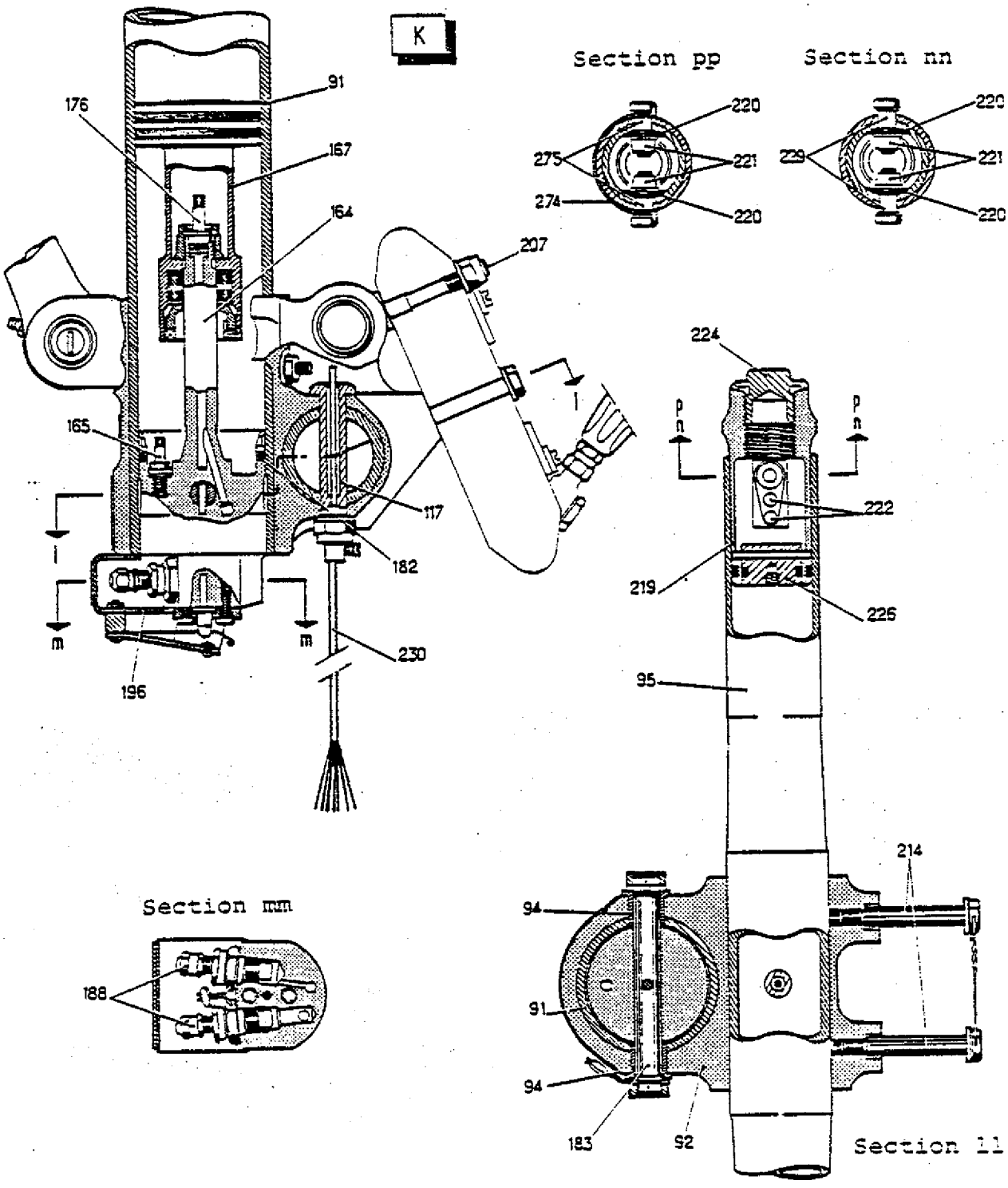


Section ff

Rear undercarriage legs
Figure 3



Rear undercarriage legs
Figure 4



Rear undercarriage legs
Figure 5

(c) The piston (131), which separates the hydraulic fluid from the nitrogen enclosed in the "LOW PRESSURE" chamber, takes the end-of-extension valve (135) with it as it moves. This valve is attached to the spring (133), itself attached to the piston (131), and is guided by the socket (132). (See figure 3 - detail E).

(d) The separator piston (167) moves inside the sliding rod (91) and over the bottom base (164). It separates the "HIGH PRESSURE" (HP) and "LOW PRESSURE" (LP) chambers. Its movements are governed by the pressures existing in these two chambers (see figure 5 - detail K).

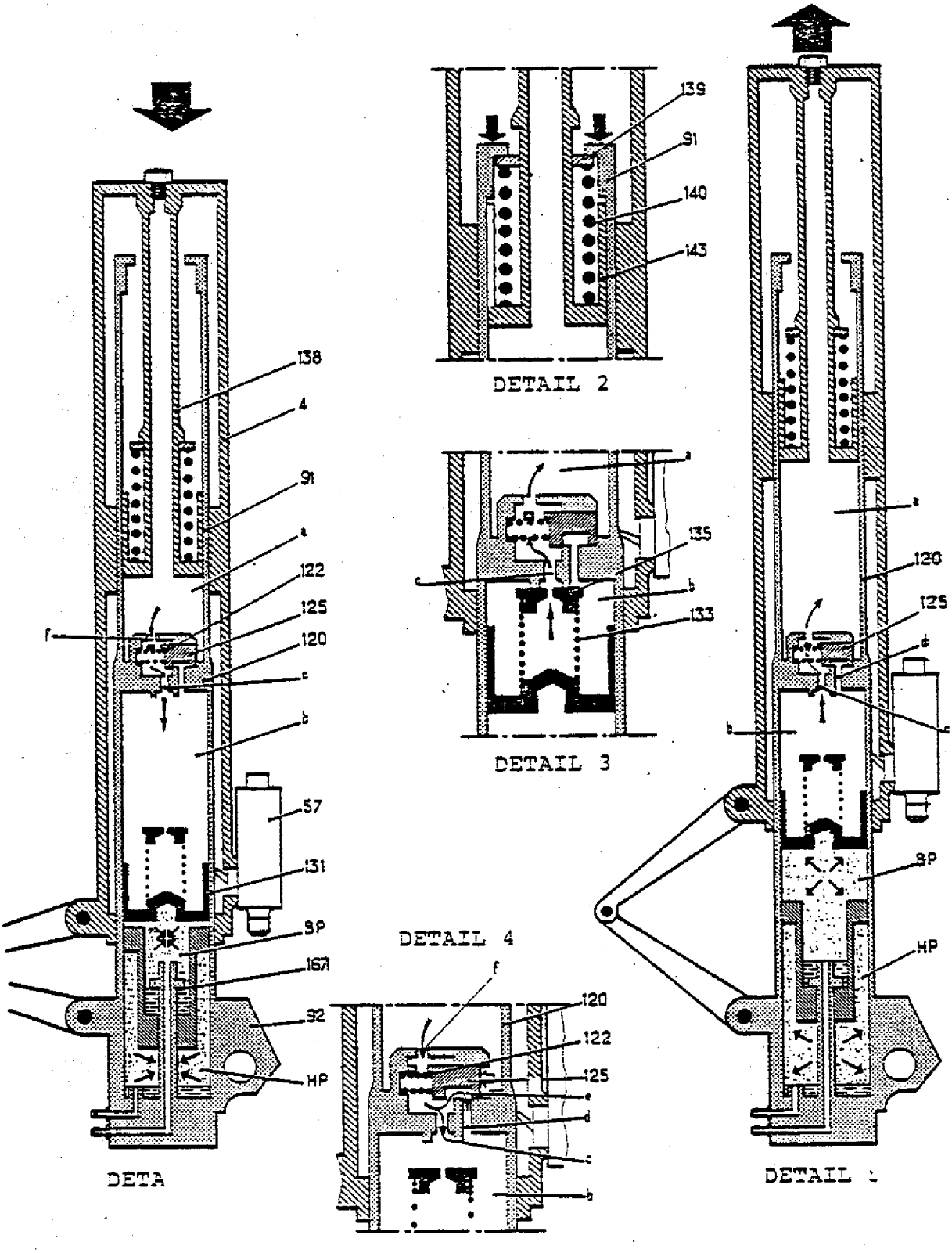
(e) Fixed to the bottom base (164) are the level tubes (165) and (176), through which a specific quantity of AIR 3520 (MIL-H-5606B) hydraulic fluid can be introduced into the HP and LP chambers respectively. This fluid maintains the lubrication of the walls over which slide the separator pistons and the seals which keep the gas chambers gas-tight (see figure 5 - detail K).

(f) The axle pot (92) is fixed to the sliding rod by means of pin (183) and bushes (94). (See figure 5 - section II).

This axle pot, designed to take the brake, is equipped with threaded end pieces (205) and screws (212) for securing it in position (see figure 5 - detail K and section II).

It has a pair of lugs which, in conjunction with the pin (101), forms the lower attachment point for the torque arm (103). The attachment pin (10) for torque arm (12) and the attachment pin (101) for torque arm (103) are fitted respectively with grease nipples (21) and (112). (See figure 4 - detail G and sections hh and kk).

(g) On the bottom base (164) are mounted the valves (188), for inflation and for the introduction of the lubricating fluid into the HP and LP chambers. These valves are protected externally by means of the cover assembly (196). (See figure 5 - detail K and section mm).



Rear undercarriage legs
Figure 6

This cover assembly is fitted with a spring device to allow its rapid removal, and carries a plate on which is inscribed the word "VALVES" (see figure 1).

(h) The axle (95) is fixed to the axle pot (92) by means of the pin (117). Screws (229) hold the sockets (219) in position, and also secure the wheels to the axle. The sockets themselves each have a blank (226) and a plug (224). The nuts (221) and the shims (220) are fixed to the sockets (219) by means of two rivets (222). (See figure 5 - detail K and sections ll and nn).

NOTE : For legs type C22093-1006, the screws (229) are replaced by screws (273), locked by lock plates (272). (See figure 5 - section pp).

(i) The torque arms allow the sliding rod (91) to move up and down within the barrel (4), while maintaining the wheels parallel to the helicopter centreline.
This parallelism can be adjusted at the middle pivot point of the torque arms (see figure 4 - detail G and section jj).

(j) The middle pivot point is lubricated through a grease nipple (246). (See figure 4 - section jj).

(k) A static discharger assembly (230) and four bonding strips (59), (72), (77) and (214) provide the electrical bonding. The bonding strips link respectively the barrel (4) and the switch (57) -(see figure 4 and figure 3 - detail E and section ff), the barrel and the torque arm (12), the two torque arms (12) and (103), the torque arm (103) and the axle pot (92) - (see figure 1 and figure 4 - detail G).

2. Operation (see figure 6)

A. Shock absorber compression (see details 1 and 4)

The application of a force to the leg causes the barrel (4) to telescope over the sliding rod (91), while the column (138) telescopes inside the latter.

- The contacts of switch (57) change over.

- The pressurized fluid in chamber (a) is expelled into chamber (b) through the restrictor (120) :

(1) If the compression is slow, the spool (125) is held against the restrictor (120) by the spring (122). The fluid is throttled by passing through port (c) of the restrictor (120) only (see detail 1).

(2) If the compression is fast, the pressure drop caused by the flow of the fluid through port (f) induces a movement of the spool (125), compressing the spring (122). The opening (e), associated with the two ports (d) (only one port has been shown on the figure), provides the fluid flowing out of chamber (a) with a larger cross-section (see detail 4).

Fluid throttling is provided by port (c) and by ports (d) in the restrictor (120) (see detail 4).

(3) Once the pressures acting on either side of the spool (125) are again equalised, the latter, which is permanently subjected to the action of the spring (122), is once more pressed against the restrictor (120).

(4) The piston (131) is pushed downwards by the pressurized fluid entering chamber (b), an increase in the pressure in the LP chamber thus resulting.

(5) At the end of the compression stroke, the piston (167) may be displaced, without, however, coming into contact with the piston (131).

(6) The pistons (131) and (167) come to a halt when the pressures in the nitrogen and fluid chambers are equalised.

The maximum permitted compression travel of the shock absorber is reached when the axle pot (92) comes into contact with the barrel (4).

B. Shock absorber extension (see details 2, 3 and 5)

A reduction in the force applied to the shock absorber results in the expansion of the nitrogen contained in the LP and HP chambers. As the spool (125) is held pressed against the restrictor (120), the ports (d) play no further part in the throttling of the fluid expelled from chamber (b) into chamber (a). The throttling takes place solely through port (c).

At the end of the shock absorber extension travel, the damping is increased by the action of the end-of-extension valve (135), which moves to close off port (c) and thus provide the fluid expelled from chamber (b) with a port of a smaller cross-section. Throttling of the fluid is therefore increased, and the energy which was stored in the HP and LP chambers during the compression stroke is released at a slower rate.

If the extension is complete, the pressures in the HP and LP chambers will be at their nominal values.

The sliding rod (91), having compressed the spring (140) through the guide (139), will be pressed against the piston (143).

The valve (135) is held against the restrictor (120) by the action of the spring (133).

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DISASSEMBLY

1. Operations to be carried out before disassembly

CAUTION : BEFORE ANY DISASSEMBLY OPERATIONS ARE UNDERTAKEN, IT IS ESSENTIAL THAT THE SHOCK ABSORBER BE COMPLETELY DEPRESSURIZED.

A. Depressurize the shock absorber (see figure 1105)

(1) Remove cover assembly (196).

(2) Remove plugs (191) and the cores from the two valves (188) - key M3534.

(3) Gradually unscrew the valve control nuts, a maximum of one and a half turns, starting with the LP valve.

(4) Refit the cores and the plugs.

B. Drain the shock absorber (see figure 1104)

NOTE : Carry out the draining operation above a drip tray.

(1) Unlock and remove cap (161).

(2) Remove plug (158).

CAUTION : THERE MAY BE A RESIDUAL PRESSURE IN THE FLUID CHAMBER DUE TO THE LEAKAGE OF NITROGEN UNDER PRESSURE PAST THE SEALS OF PISTON (131). REMOVE PLUG (158) WITH CARE.

(3) Compress the shock absorber to drain it.

(4) Extend the shock absorber completely.

C. Remove the protective sealing

- Remove the external protective sealing (rubber compound) from the joints with a spatula or a sharp tool.

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2. Removal of attached components

A. Removal of electrical cable (253) (see figure 1105)

(1) Holding the electrical cable, cut and discard clamp (254).

(2) Disconnect electrical cable (253) from the switch and remove the former.

B. Removal of hose assembly (249) (see figures 1102 and 1105)

(1) Remove the attachment screws from the two clamps (86) and (269), and remove the latter.

(2) Withdraw mounts (84) and (85), then remove the hose assembly.

(3) Remove and discard the adhesive tape (87).

C. Removal of switch (57) (see figure 1102)

(1) Remove the two nuts (67), with washers (66), then remove protective cover assembly (63).

(2) Unlock and remove the two bolts (61), free bonding strip (59), and remove washers (58) and (60).

(3) Remove switch (57).

D. Removal of the bonding strips (see figures 1102 and 1105)

(1) Remove the attachment nuts and screws for bonding strips (59), (72), (77) and (214), withdraw the bonding strips and their washers, then remove the nuts, bolts (68) and (75) and screws (234).

NOTE : Washers (69), (76), (98) and (235) are bonded with ARALDITE. See paragraph G.

E. Removal of static discharger assembly (230) (see figure 1105)

Remove screw (233) and remove the static discharger assembly.

C. Removal of switch (57) (see figure 1102)

(1) Remove the attachment nuts and screws for bonding strips (59), (72), (77) and (214), withdraw the bonding strips, their washers and their lock plates, then remove the nuts, bolts (68) and (75) and screws (234).

3.

(1) Remove cotter pin (277) and washer (276).

(2) Remove nut (245) and screw (244).

3. Removal of basic components

Removal of complete rod (88) (see figures 1104 and 1105)

(1) Remove nut (245) and screw (244).

(2) Remove grease nipple (246).

(3) Holding pin (237), remove nut (243) and lock sleeve (242).

(4) Holding the torque arms, drive out pin (237), and remove half cage (239).

(5) Extract split pin (157), remove nut (156) with wrench PR 47689, then remove cup (155).

(6) Extract the complete rod assembly from the barrel.

NOTE : Hold the torque arms during this operation.

4. Disassembly of basic components

NOTE : During the disassembly operations, do not mix up the component parts of identical assemblies, and take particular note of their positions if they form part of a hinged joint.

A. Stripping of the barrel (see figures 1101 and 1102)

(1) Removal of torque arm (12) assembly

(a) Extract split pin (20) and remove washer (19).

(b) Drive out pin (18), and remove it together with grease nipple (21).

(c) Drive out pin (10) and remove the torque arm assembly, collecting the two washers (14).

(d) Extract grease distributor (15) from pin (10).

(2) Removal of base assembly (46)

(a) Remove stop ring (56).

(b) Remove nut (55), using wrench C46535, together with washer (54).

(c) Remove the base assembly from the inside of the barrel.

(3) Removal of ball joint bearing assembly (38)

(a) Grip pin (42) from inside the barrel, using a 5 mm (0.1968 in) ALLEN key, and remove grease nipple (45) and nut (44).

(b) Drive out pin (42) and collect washer (43).

(c) Extract the ball joint bearing assembly.

(4) Removal of guide assembly (30)

(a) Grip pin (35) from inside the barrel, using wrench 61788, and remove nut (37).

(b) Drive out pin (35) and collect washer (36).

(c) Extract the guide assembly.

(5) Removal of base (26)

(a) Extract split pin (29).

(b) Hold base (26) and remove nut (28), using wrenches C46830 and C47606, together with washer (27).

(c) Extract the base.

B. Stripping of complete rod (88) (see figures 1103, 1104 and 1105)

NOTE : The removal of the internal components of sliding rod (91) should be carried out above a drip tray.

(1) Grip the sliding rod in a vice, using soft jaws C46797.

(2) Removal of torque arm (103) assembly

(a) Extract split pin (111) and remove washer (110).

(5) Removal of socket assemblies (218)

- Remove the four screws (275), together with lock plates (274), and extract socket assemblies (218) from axle (95).

(b) Drive out pin (109), and remove grease nipple (112) from it.

(c) Drive out pin (101) and remove the torque arm assembly, together with the two washers (105).

(d) Extract grease distributor (106) from pin (101).

(3) Removal of the two end pieces (205)

(a) Extract the two split pins (207) and withdraw end pieces (205) from pin (204).

(b) Drive out the pin, and remove the two end pieces (205), nuts (210), washers (209) and shims (208).

(4) Remove the two plugs (224).

(5) Removal of socket assemblies (218).

- Remove the four screws (229) and extract socket assemblies from axle (95).

(6) Remove the two screws (212), together with washers (211).

(7) Removal of pin (117)

- Remove nut (119), with washer (118), and drive out the pin.

(8) Removal of bottom base assembly (163)

(a) Unlock and remove the two screws (194), together with plate (193), then extract pin (192).

(b) Extract the two split pins (186), then remove washers (185) and bush (184).

(c) Drive out pin (183).

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(d) Withdraw the bottom base assembly with care.

CAUTION : THE EXTERNAL DIAMETERS OF PISTONS (167) AND (131) ARE COATED WITH RILSAN, WHICH IS VERY SUSCEPTIBLE TO IMPACT DAMAGE AND SCORING. THESE AREAS MUST BE VERY CAREFULLY PROTECTED.

(9) Withdraw piston assembly (130), using extractor C47605 (see CAUTION above).

(10) Removal of column (138) assembly

(a) Remove stop ring (151) and unscrew and remove threaded bushing (150), using wrench C46831.

(b) Carefully withdraw the column assembly from sliding rod (91).

CAUTION : THE EXTERNAL DIAMETER OF PISTON (143) IS COATED WITH RILSAN, WHICH IS VERY SUSCEPTIBLE TO IMPACT DAMAGE AND SCORING. THIS AREA MUST BE VERY CAREFULLY PROTECTED.

(11) Removal of restrictor (120) assembly

(a) Slacken off screw (129), using screwdriver C46093.

(b) Apply

- wrench C47456 to nut (128) in the lower part of the sliding rod

- wrench 61795 to restrictor (120) in the upper part of the sliding rod.

(c) Remove nut (128) and screw (129), then withdraw the restrictor assembly.

(12) Removal of axle pot (92) and axle (95)

(a) Remove the two bushes (94).

(b) Heat the axle pot to a temperature of 100°C (212°F).

(c) Drive out firstly axle pot (92), then axle (95).

CAUTION : BEFORE THE AXLE IS WITHDRAWN, MARK ITS LOCATION AND POSITION IN RELATION TO THE HOLES FOR PIN (117).

5. Stripping of basic components

A. Stripping of the component parts of the barrel (see figures 1101, 1102 and 1105)

(1) Stripping of torque arm (12) assembly

(a) Remove nut (25) and washer (24).

(b) Drive out bolt (22) and collect washer (23).

(c) Unscrew half cage (241).

(2) Stripping of base assembly (46)

(a) Remove one of the peened ends of pin (51) with a drill, then drive the pin out.

(b) Remove stop rings (53), then drive out pin (52).

(c) Remove roller carrier (48), drive out pin (50), and collect roller (49).

(3) Stripping of ball joint bearing assembly (38)

(a) Extract and discard scraper ring (41).

(b) Remove ball (40) from cage (39).

(4) Stripping of guide assembly (30)

- Remove the three screws (34), then extract bushing (33) and guide (32) from cage (31).

B. Stripping of the component parts of the sliding rod (see figures 1103, 1104 and 1105)

(1) Stripping of torque arm (103) assembly

(a) Remove nut (116) and washer (115).

(b) Drive out screw (113) and collect washer (114).

(c) Unscrew ball (240).

(2) Stripping of bottom base assembly (163)

(a) Grip bottom base (164) in a vice with soft jaws C46827.

(b) Remove the two valves (188), together with their preformed packings (189).

(c) Unlock and remove nut (178) using wrench 61800, discarding lock washer (179).

(d) Extract level tube (176).

(e) Remove and strip piston (167) assembly. See CAUTION para. 4.B.(8).

- Place the piston in the vice, using soft jaws 63693.

- Withdraw split pin (175).

- Remove threaded bush (174), using wrench C47439.

- Remove in succession washer (173), packing holder (169) and washer (168).

(f) Remove level tube (165).

(3) Stripping of piston assembly (130) (see CAUTION para. 4.B.(8))

(a) Remove valve (135) from spring (133), and collect cup (134).

(b) Remove spring (133) and socket (132) from piston (131).

(4) Stripping of column (138) assembly (see CAUTION para. 4.B.(10))

(a) Grip the column in a vice with soft jaws C47604.

(b) Withdraw split pin (149), remove nut (148), using wrench C47602, and collect washer (147).

(c) Remove in succession

- piston (143)
- ring (142)
- cup (141)
- spring (140)
- guide (139).

(5) Stripping of restrictor (120) assembly

(a) Unlock and remove screw (126), discarding lock washer (127).

(b) Remove in succession

- matched spool (123)
- spring (122)
- orifice plug (121).

CAUTION : TO AVOID DAMAGE TO THE HONED SURFACES OF SPOOL (125) AND CYLINDER (124), DO NOT SEPARATE THESE TWO PARTS.

(6) Stripping of cover assembly (196)

(a) Remove nuts (202) and the two screws (201).

(b) Remove in succession

- box (200)
- spring (199)
- spacer (198)
- cover (197).

(7) Stripping of socket assemblies (218)

- Drive out the four pins (228) and withdraw blanks (226).

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6. Removal of bonded parts

NOTE : Note all the information given on the identification plates.

- Metal plates (152), (153), (154) (if applicable), (203), (255), (256), (257), (259), (260), (261), (262), (263), (264), washers (69), (76), (98), (235) (see figures 1102 to 1105).

- Separate the ARALDITE-bonded metal plates and washers from their supporting surfaces by immersing the latter in acetone.

CLEANING

1. Standard procedures

The MANUAL 32-09-01 contains all the instructions concerning the cleaning and stripping of the parts.

The processes applicable to this section are :

- Paint stripping : Sections 28, 29 and 30.
- Sealing of mating parts with VITON basis products : Section 25.

2. Cleaning

Before cleaning the parts, remove and discard all seals and packings, using the curved end of spatula 89901 or A46524 to extract them from their grooves (the latter spatula only must be used to remove those seals fitted to rilsan-coated parts).

(1) Clean the MASTINOX-coated surfaces of the parts with D1 PYROLAC 1591 solvent, obtainable from Ets ASTRAL, 11,13 Av. du President Salvador Allende - 94400 -VITRY - FRANCE.

(2) Subsequently clean all parts with WHITE SPIRIT and dry them with dry compressed air.

3. Stripping of paint

(1) Preparation

Before embarking on any paint removal, apply a protective bead of VITON, obtainable from Ets LE JOINT FRANCAIS, 54 à 116 rue Salvador Allende - 95870 - BEZONS - FRANCE, to seal off any parts containing bushes or other force-fitted items. This operation is to prevent the ingress of stripper between the mating surfaces.

(2) Stripping operation

Strip the paint

- Either by brushing on SCALPEX, obtainable from the Societé S.C.A.L.P. Allée Monthyon prolongée - 93320 - PAVILLONS/BOIS - FRANCE.

R

- Or by immersion in ORTHONETOIL P, obtainable from the Société S.P.C.A. 7, Quai Marcel Boyer - 94200 - IVRY/SEINE - FRANCE.

- If necessary, strip the paint by blasting with crushed apricot stones - LIGNOBLAST CA 12/3, obtainable from Ets LIGNOBLAST, BP 18 - 83490 - LE MUY - FRANCE.

INSPECTION/CHECK

1. Standard procedures

The MANUAL 32-09-01 contains all the instructions concerning the various metallurgical checks.

The procedures applicable to this section are :

- Crack detection by the dye penetrant method : Section 38 or 39.
- Crack detection by the magnetic particle method : Section 42.

2. Visual inspection

A. General inspection

- Examine each part for signs of corrosion. Assess its importance, in terms of area, depth, location and relationship to fatigue areas. In the case of light corrosion, which does not justify the rejection of the part, remove the corrosion as indicated in the section "REPAIR".
- Check that there are no signs of impact damage or scratches (circumferential or longitudinal) on moving or fixed parts where sealing is required.
- Examine carefully the locating grooves (sides and bottom) on parts fitted with sealing rings or guides.
- Check that all parts are free from cracks, especially in fatigue areas.
- Check on all threaded parts that there are no signs of impact damage, crushing or stripping of the threads.
- Check that all chromium-plated surfaces are free from scratches, pitting or chafing. Ensuring that they are clean and dry, wipe such surfaces with a rag soaked in copper sulphate. The areas not covered with chrome will appear in red.

B. Detailed inspection

(1) Examine the state of the chromium-plated surfaces of column (138), sliding rod (91), ball (40) and axle (95). See figures 1102, 1103 and 1104.

If in doubt, ensure that the surfaces are clean and dry, then wipe them with a rag soaked in copper sulphate.

NOTE : Should scraper ring (41) (fig. 1102) have left a mark on the chromium-plated diameter of the sliding rod, restore the chromium-plating on the latter as indicated in the section "Repair".

(2) Examine the state of the spherical surfaces of cage (39) and of ball (40). Ensure that these two parts swivel together smoothly (see figure 1102).

(3) Check the condition of the grease nipples (threads and ball) and check that the bore is not blocked.

(4) Check hose assembly (249) (see figure 1105).

NOTE : Before carrying out this inspection, check that the life of the hose has not expired, and that the life remaining to it justifies its re-installation.

- Look for signs of leaks, particularly along the flanks of the connections, and make sure that the latter are in good condition.

- Check visually that the diameter of the bore is constant throughout the length of the hose.

- Examine the state of the external covering of the hose, and make sure that it has not been damaged by accidentally rubbing against an external object.

(5) Check that spool (125) is able to slide freely in cylinder (124), without any high spots (see figure 1104). If any defect is found, the complete matched assembly must be rejected.

(6) Check that springs (122), (133) and (140) are neither weak nor broken. Carry out a dimensional check on them - see para. 4.B.

3. Metallurgical testing

A. Testing of light alloy parts

(1) Using one of the following dye penetrant methods, detect any cracks present in the following parts in particular :

- barrel (4) (fig. 1101)
- torque arms (12) and (103) (fig. 1101 - 1103)
- axle pot (92) (fig. 1103)

R - piston (167) (fig. 1104)

(a) Fluorescent dye penetrant testing, using ZYGLO ZL22 at ambient temperature, obtainable from Ets DUFOUR, 11, rue Aspirant Dargent - 92300 - LEVALLOIS-PERRET (or similar product).

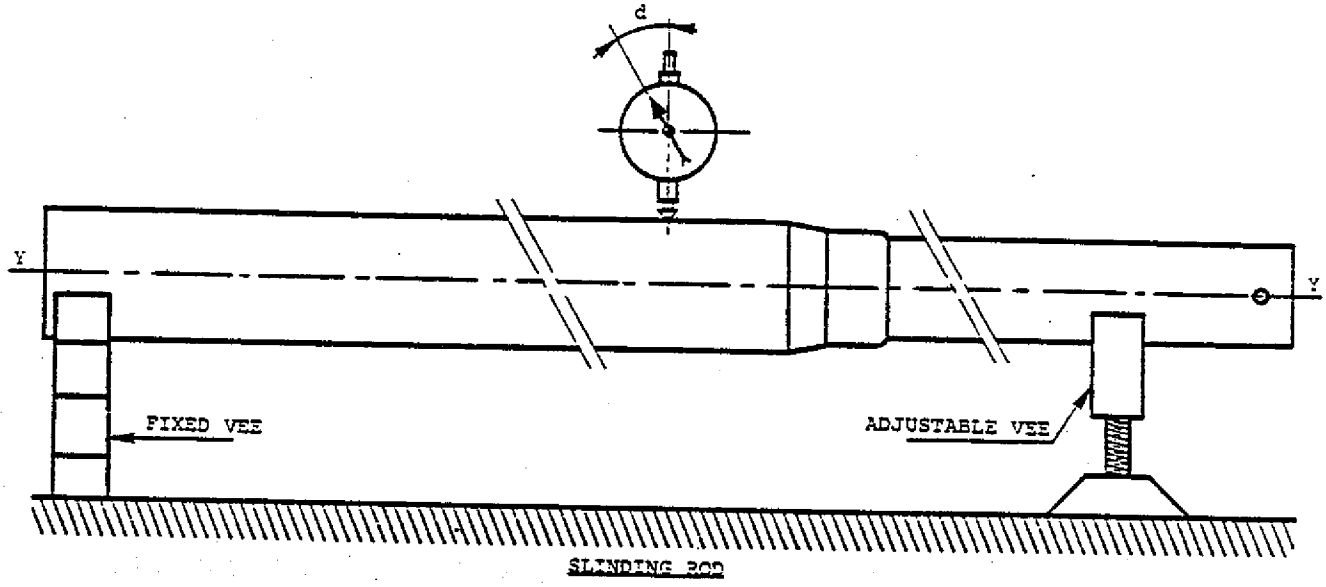
(b) Hot fluorescent dye penetrant testing, using ZYGLO ZL22 with liquid emulsifier ZE3 (same supplier).

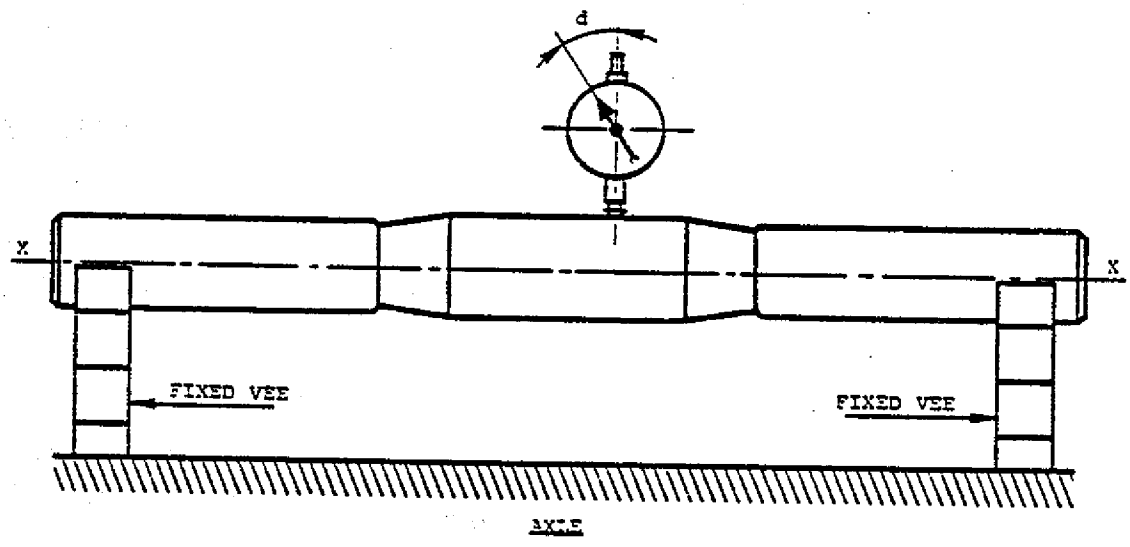
B. Testing of steel parts

(1) Detect any cracks present in the following parts, in particular, using a magnetic particle method :

- pin (10), base (26) (fig. 1101)
- sliding rod (91), axle (95), pins (101) and (117) (fig. 1103)
- bottom base (164), column (138) (fig. 1104).

NOTE : Take advantage of any occasions when the chrome has been removed from the parts to carry out this test.





Geometrical check

Figure 301

4. Geometrical checks

NOTE : To create the correct conditions for carrying out these checks, any corrosion or signs of impact damage standing proud in the bores must first be removed. This must be done by lightly rubbing with emery cloth, so as not to alter the bore dimensions.

A. Geometrical check of barrel (4)

No geometrical check is to be carried out on this part. An analysis of the dimensional checks will indicate whether the distortions are acceptable or not. See the section "FITS AND CLEARANCES".

B. Geometrical check of sliding rod (91) (see figure 301)

(1) Place the sliding rod on a surface plate, with the larger end resting on a fixed Vee block, and the other end on an adjustable Vee block.

(2) By means of the adjustable Vee block, bring the axis Y parallel with the surface plate.

(3) Measure the roundness error by rotating the sliding rod through one complete turn. The maximum deviation "d" of the dial gauge pointer will correspond to twice the true value of the deflection.

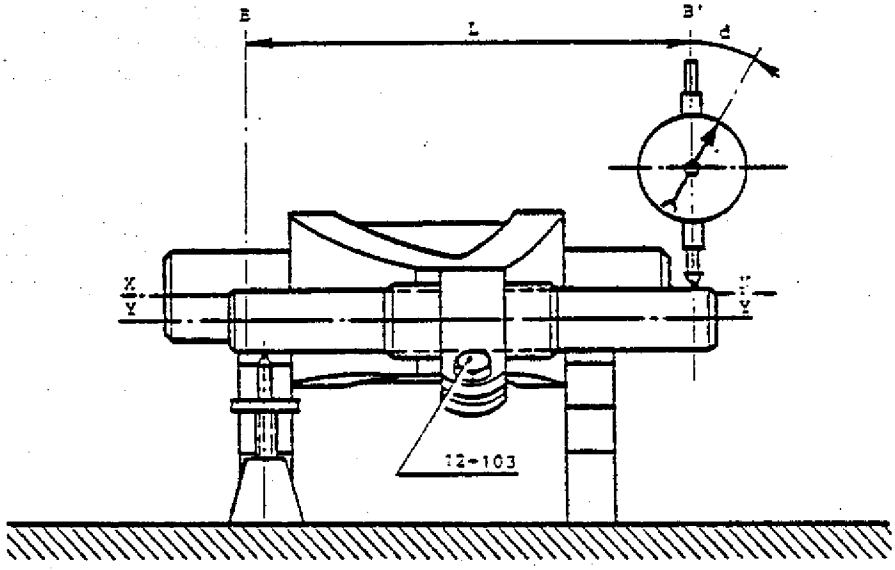
- The maximum permitted deflection is 0,28 mm (0.011 in).

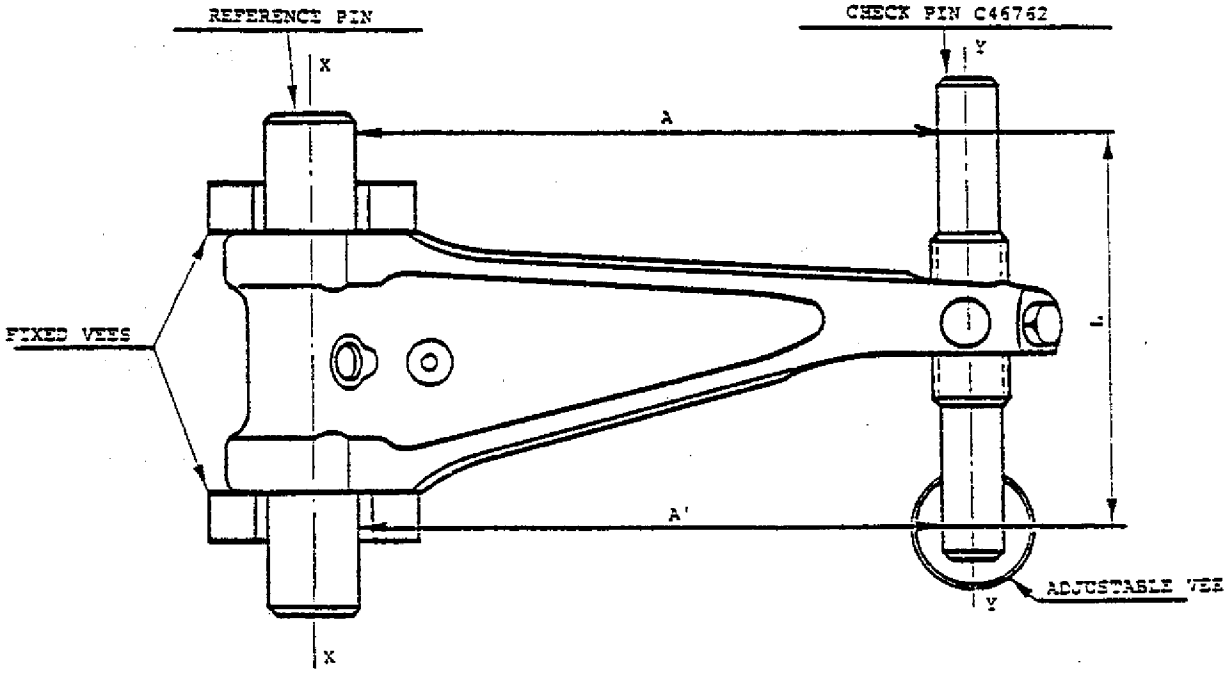
C. Geometrical check of axle (95) (see figure 301)

(1) Place the axle on a surface plate, with each end resting on an identical fixed Vee block.

(2) Measure the roundness error by rotating the axle through one complete turn. The maximum deviation "d" of the dial gauge pointer will correspond to twice the true value of the deflection.

- The maximum permitted deflection is 0,24 mm (0.094 in).





Geometrical check
of compas arms
Figure 302

D. Geometrical check of torque arms (12) and (103) (see figure 302)

(1) Fit a measurement spigot and a check pin C46762 to the torque arm, and secure it in position by means of bolt (22) or screw (113), with its nut. Place the torque arm on a surface plate, with the measurement spigot resting on two identical fixed Vee blocks, and one end of the check pin on an adjustable Vee block.

(2) Set the nominal axes X and Y level.

(3) Determine the value of the twist by measuring the difference in level "d" between points B and B'.

The maximum permitted slope between X and Y is equal to the ratio $\frac{d}{L}$, and must not be greater than 0,35%.

(4) Determine the parallelism error by measuring dimensions A and A'.

The maximum permitted slope is the ratio $\frac{A - A'}{L}$, and must not be greater than 0,35%.

5. Dimensional checks

NOTE : If the surfaces to be checked are affected by corrosion, subject those parts to corrosion removal treatment first as indicated in the section "REPAIR".

A. Check of mating parts

(1) Measure the dimensions of the mating parts listed in the section "FITS AND CLEARANCES".

(2) Compare the measured values with the dimensions given in the table, and decide if the mating parts in question can be refitted as they are, if they must be replaced, or if they are capable of being reworked within the permitted limits (refer to the section "REPAIR").

NOTE : If the part is to be refitted without any repair action, it must have sufficient life remaining to allow the assembly to which it belongs to complete a further operational cycle.

B. Check of detail parts

Check the characteristics of the springs listed below (see fig. 1104), by measuring the lengths H1 and H2 under the applied loads P1 and P2.

(1) Spring (122)

- Free length : 20,25 mm (0.797 in)

H1 = 17 mm (0.67 in) for P1 = 12,4 ± 0,2 N
R (89.7 ± 1.4 pdl)

R H2 = 13,5 mm (0.531 in) for P2 = 25,77 ± 0,3 N
R (186.4 ± 2.1 pdl)

Spring ends to be within 2% of square.

(2) Spring (133)

- Free length : 64 ± 1 mm (2.519 ± 0.039 in)

H1 = 54 mm (2.12 in) for P1 = 29,2 ± 4,4 N
(211.2 ± 31.8 pdl)

H2 = 34 mm (1.33 in) for P2 = 87,4 ± 131 N
R (632.3 ± 947 pdl)

(3) Spring (140)

- Free length : 100,68 mm (3.96 in)

H1 = 100 mm (3.93 in) for P1 = 25,2 ± 9,8 N
(182.23 ± 70.9 pdl)

H2 = 61 mm (2.40 in) for P2 = 1470 ± 73,5 N
(10635 ± 532 pdl)

Spring ends to be within 2% of square.

NOTE : If these tolerances are exceeded, the spring must be rejected.

REPAIR

1. General instructions

A. Standard procedures

The MANUAL 32-09-01 contains all the instructions concerning corrosion removal, protective treatment and painting. The processes applicable to this section are :

- Passivating de-oxidization of ferrous metals : Sections 20 and 21.
- Sealing compound for joints (ARALDITE) : Section 27.
- Passivating de-oxidization, derusting of aluminium alloys : Section 22.
- Sealing compound for joints (LOCTITE) : Section 26.
- Stylus electro-plating process - cadmium-plating : Section 15.

R - Dichromate treatment of magnesium : Section 49 or 50.

R - Chromic acid anodizing : Section 12.

R - Black oxide treatment of steels : Section 7.

- Restoration of surface finish on aluminium alloy parts (ALODINE 1200) : Section 14.
- EPOXY paint baked at 200°C (392°F) : Section 33.
- Direct chromium-plating of steels : Section 2.
- Anti-ester paint : Section 37.
- Phosphate treatment of ferrous metals : Section 8.

B. Corrosion removal

(1) Remove slight traces of corrosion by abrasion of the affected surfaces provided, where a mating part is concerned, that the dimensions are not excessively altered.

- For the following parts, use only an abrasive stone or a glass-fibre brush :

Sliding rod (91), pins (10), (101), (117), (204) and cup (141) (see figures 1101, 1103, 1104 and 1105).

NOTE : Any corrosion found on springs (122), (133) and (140) must result in their rejection.

(2) Remove deep corrosion by a chemical process, using an appropriate product, provided that the extent of the corrosion does not affect the strength of the part.

Products to be used :

(a) For the aluminium alloy parts - barrels (4 E.F), cage (39), torque arms (12) and (103), axle pot (92) (see figures 1101, 1102 and 1103) : apply DEOXIDINE 624, obtainable from C.F.P.E., 28 Bd Camélinat - 92233 - GENNEVILLIERS - FRANCE.

(b) For the steel parts (excluding those mentioned in paragraph (1)) - column (138), bases (26) and (164) (see figures 1101, 1103 and 1104) : apply JENOLITE RRN 1, obtainable from Ets. LIBERON Dpt JENOLITE, 15 rue Joliot Curie - 91690 - SACLAS - FRANCE.

(c) For the magnesium alloy parts - barrels (4 A.B.C. D.) cage (31) (see figure 1101).

- Remove points of corrosion with a round-headed spot-facing cutter until sound metal appears.

- Using a bristle or nylon brush, apply a moderate amount of a solution of chromic acid (10% by weight in distilled water). Allow it to penetrate for five minutes, rinse copiously in clean water and dry in dry compressed air.

NOTE : On no account must the spot-facing affect the strength of the part. When in doubt, refer to MESSIER-HISPANO-BUGATTI, specifying the extent of the spot-facing and its location on the part.

C. Temporary protective treatment

An anti-corrosive treatment should be applied to parts which are awaiting restoration of the protective treatment, re-machining, or reassembly.

Product to be used : ROCKET WD40 (MIL-C-23411), from LABORATOIRE AGIR, SEZEZIN DU RHONE - 69630 - FRANCE.

NOTE : This product is easily removed with WHITE SPIRIT.

D. Positioning of parts to be rebored

Dependent on the circumstances, proceed as follows :

- Either locate the part on the machine, using the centre-line of its bore or its external diameter as reference.
- Or locate the part on the machine, using as reference the positioning datums and dimensions shown on the relevant figure(s).

2. Detailed instructions

A. Repair of barrel (4 A-B-C-D) (figure 401)

(1) Replacement, if necessary, of bushings (5 A-B) (see figure 1101)

CAUTION : EACH TIME THE BARREL IS REBORED, PROTECT THE REMACHINED SURFACES BY DICHROMATE TREATMENT AND PAINTING, IN ACCORDANCE WITH PARAGRAPH C.(1) OF THE SECTION "PROTECTIVE TREATMENT".

(a) Remove the bushings.

(b) If necessary, remachine diameter A as shown on figure 401 :

- Rebore to the repair dimension in the table in paragraph 3 which results in the removal of the defect.
- Rework the entry chamfers (on the inner face).
- Apply protective treatment to the diameter A bores.

NOTE : The remachining requires the fitment of two bushings (5 A-B) to the corresponding repair dimension.

(c) Shrink fit the bushings :

- Coat the dia. A bores with MASTINOX, obtainable from Ets CELOMER 75 Bld Winston Churchill - 76600 - LE HAVRE - FRANCE.

- Cool the bushings in liquid nitrogen, then insert them into the holes from the inner faces of the lugs. Hold them in position until they have returned to ambient temperature.

(d) Remachine the bushings as indicated on the figure :

- Rebore the bushings in line.

- Rework the flanges of the bushings to obtain the correct distance between them.

- Rework the chamfers.

(2) Replacement, if necessary, of bushings (6 A-B)

(a) Remove the bushings.

(b) If necessary, remachine the dia. B bores in accordance with the instructions given on the figure.

- Rebore in line to the repair dimension in the table in paragraph 3 which results in the removal of the defect.

- Rework the entry chamfers (on the inner face).

Apply protective treatment to the dia. B bores.

NOTE : The remachining requires the fitment of two bushings (6 A-B) to the corresponding repair dimension.

(c) Shrink fit the bushings, using the method recommended in (1)(c), with the dia. B bores coated with Mastinox 6856K.

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(d) Remachine the bushings as indicated on the figure.

NOTE : These bushings form part of the upper pivot of the torque arms, and must be matched with the associated pin. Their reboring will be determined by one of the repair conditions for the pivot which are referred to in paragraph F.

- Rebore as defined in the NOTE.
- Rework the flanges of the bushings to obtain the correct distance between them.
- Rework the chamfers.
- Carefully deburr the edges of the lubrication grooves.

(3) Replacement, if necessary, of bushings (7 C-D) and adjustment of the thickness of washer (83) (figure 1102)

(a) Remove the bushings.

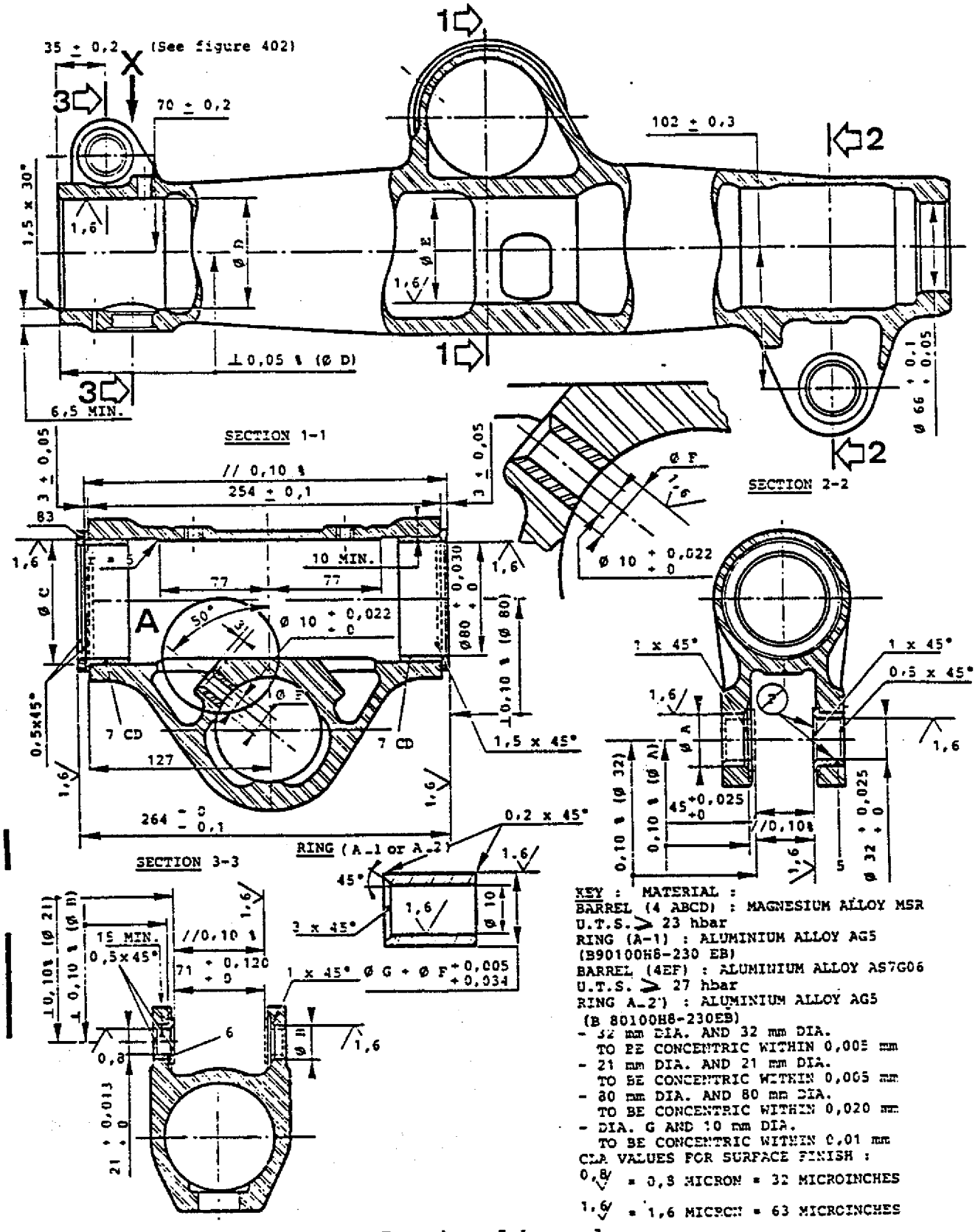
(b) If necessary, remachine the dia. C bores in accordance with the instructions given on the figure.

- Rebore to the repair dimension in the table in paragraph 3 which results in the removal of the defect.
- Rework the entry chamfers.
- Apply protective treatment to the dia. C bores.

NOTE : The remachining requires the fitment of two bushings (7 C-D) to the corresponding repair dimension.

(c) Shrink fit the bushings

- Coat the outer diameters and the flanges of the bushings with ARALDITE.
- Insert the bushings in the barrel and hold them there, with their flanges properly seated.



KEY : MATERIAL :
BARREL (4 ABCD) : MAGNESIUM ALLOY MSR
U.T.S. ≥ 23 hbar
RING (A-1) : ALUMINIUM ALLOY AG5
(B90100H8-230 EB)
BARREL (4EF) : ALUMINIUM ALLOY AS7G06
U.T.S. ≥ 27 hbar
RING A-2') : ALUMINIUM ALLOY AG5
(B 80100H8-230EB)
- 32 mm DIA. AND 32 mm DIA.
  TO BE CONCENTRIC WITHIN 0,005 mm
- 21 mm DIA. AND 21 mm DIA.
  TO BE CONCENTRIC WITHIN 0,005 mm
- 80 mm DIA. AND 80 mm DIA.
  TO BE CONCENTRIC WITHIN 0,020 mm
- DIA. G AND 10 mm DIA.
  TO BE CONCENTRIC WITHIN 0,01 mm

CLA VALUES FOR SURFACE FINISH :

0,8 = 0,8 MICRON = 32 MICROINCHES

1,6 = 1,6 MICRON = 63 MICROINCHES

Repair of barrels
Figure 401

(d) Check the bores of bushings (7 C-D) against the dimensions given on the figure.

(e) Adjust the thickness of washer (83) in accordance with the instructions given on the figure.

NOTE : Refer to figure 1102 for the position of the washer on the barrel.

- Grind one of the faces of the washer to obtain the separation dimension.

- Rework the chamfer and deburr carefully.

- Protect the remachined surfaces by chrome anodising.

CAUTION : AFTER THIS ADJUSTMENT, THE WASHER MUST NOT BE SEPARATED FROM THE UNDERCARRIAGE LEG, BUT MUST ACCOMPANY IT UNTIL IT IS FITTED TO A HELICOPTER.

(4) Reworking, if necessary, of the dia. D bore for cage (39) (figure 1102), and of the dia. E bore for cage (31) (figure 1101)

(a) Remachine the bores in accordance with the instructions given on the figure :

- Rebore to the repair dimension in the table in paragraph 3 which results in the removal of the defect.

NOTE : The remachining of dias. D and E requires the fitment of cages (39) and (31) to the corresponding repair dimensions.

- Rework the chamfer and remove sharp edges.

- Apply protective treatment to the dia. D and E bores.

(5) Reconditioning of the dia. F bore (figure 401)

NOTE : For a minor reworking of the bore to a diameter not greater than 10,022 mm (0.3946 in), restore the protective treatment by dichromate treatment.

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(a) Reworking of the dia. F bore

- Remachine the bore until the defects have completely disappeared, in accordance with the instructions given on the figure. Deburr the edges carefully.

CAUTION : THE REMACHINING OF THE DIA. F BORE MUST REMAIN WITHIN THE FOLLOWING LIMITS : 12 mm (0.472 in) MIN AND 12,3 mm (0.484 in) MAX.

- Protect the dia. F bore by dichromate treatment only.

(b) Measure the exact value of diameter F.

(c) Fitment of a bush in the dia. F bore :

- Rework the external diameter (dia. G) of a bush (A-1) to suit the exact measured value of dia. F, to obtain an assembly which conforms with figure 401.

- Remachine the chamfers and remove sharp edges.

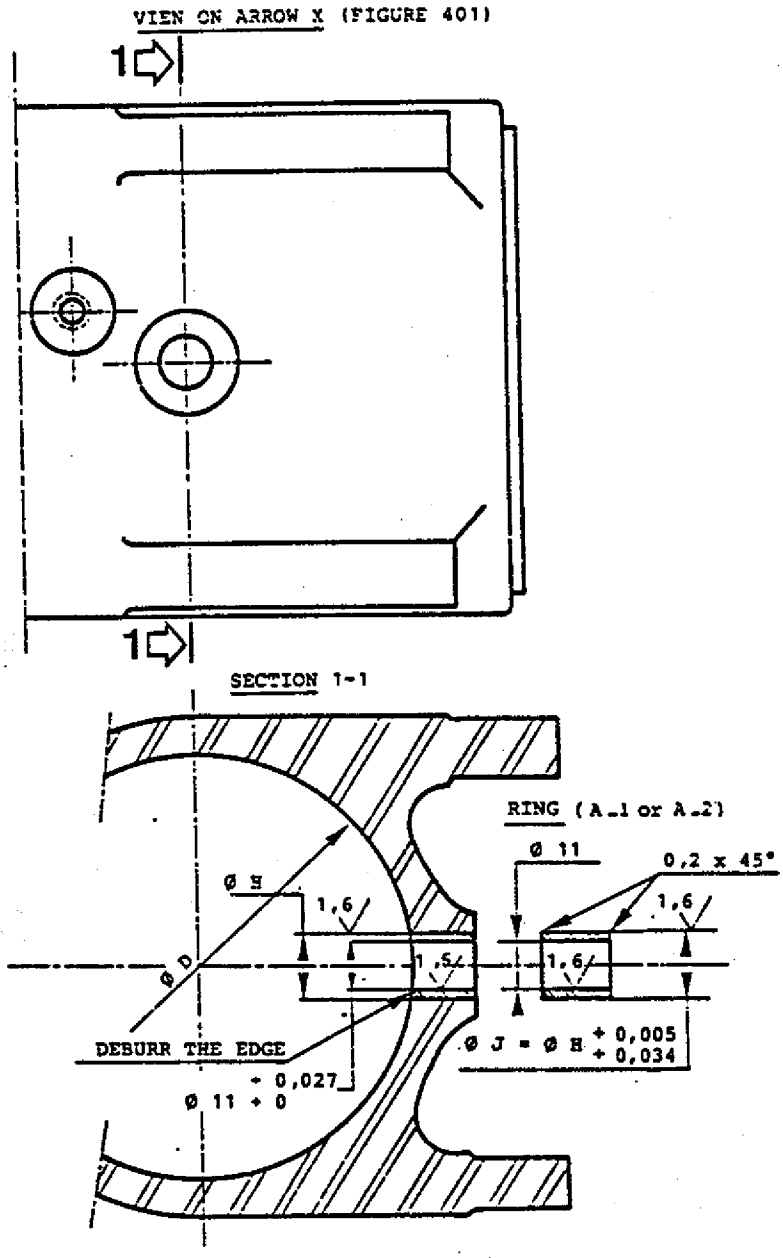
(d) Protect the remachined surfaces of the bush by the application of ALODINE 1200.

(e) Coat the dia. F bore with LOCTITE no 675, obtainable from Ets C.O.M.E.T., 10 avenue Eugène Gazeau, Zone Industrielle - 60304 - SENLIS -FRANCE.

(f) Cool bush (A-1) in liquid nitrogen, then insert it in the dia. F bore, with the 3 x 45° chamfer flush with the face of the barrel (see figure).

(g) Check the bore of bush (A-1) and its entry chamfer against the dimensions given on the figure.

(h) Apply a coat of post-primer of the Epoxy 200°C Pyrolac paint scheme inside the bore of bush (A-1).



KEY

MATERIAL :

BARREL (4A-B-C-D) : MAGNESIUM ALLOY MSR - U.T.S. ≥ 23 hbar
RING (A-1) : ALUMINIUM ALLOY AG5 (B90110H8-120EB)
BARREL (4E-F) : ALUMINIUM ALLOY AS7G06 - U.T.S. ≥ 27 hbar
RING (A_2) : ALUMINIUM ALLOY AG5 (B80110H8-120EB)

DIA. J AND 11 mm DIA. TO BE CONCENTRIC WITHIN 0.01 mm
CLA VALUES FOR SURFACE FINISH :

$1{,}6\sqrt{}$ = 1,6 MICRON = 32 MICROINCHES

Repair of barrels
Figure 402

(6) Reconditioning of the dia. H bore (figure 402)

NOTE : For a minor reworking of the bore to a diameter not greater than 11,027 mm (0.4341 in), restore the protective treatment by dichromate treatment.

(a) Reworking of the dia. H bore

- Remachine the bore until the defects have completely disappeared, in accordance with the instructions given on the figure. Deburr the edges.

CAUTION : THE REMACHINING OF THE DIA. H BORE MUST REMAIN WITHIN THE FOLLOWING LIMITS :
13 mm (0.512 in) MIN AND 13,3 mm (0.524 in) MAX.

- Protect the dia. H bore by dichromate treatment only.

(b) Measure the exact value of diameter H.

(c) Fitment of a bush in the dia. H bore

- Rebore the external diameter (dia. J) of a bush (A-1) to suit the exact measured value of dia. H, to obtain an assembly which conforms with figure 402.

- Remachine the chamfers and remove sharp edges.

(d) Protect the remachined surfaces of the bush by the application of ALODINE 1200.

(e) Coat the dia. H bore with LOCTITE no 675.

(f) Cool bush (A-1) in liquid nitrogen, then insert it in the dia. H bore, flush with the face of the barrel (see figure).

(g) After fitment, remachine the end of bush (A-1) in the dia. D bore in the barrel to its bore dimension.

(h) Check the bore of bush (A-1) against the dimensions given on the figure, and remove sharp edges.

(i) Apply a coat of post-primer of the Epoxy 200°C Pyrolac paint scheme inside the bore of bush (A-1).

(7) Reconditioning of the dia. K bore (figure 403)

NOTE : For the minor reworking of the bore to a diameter not greater than 66,100 mm (2.6024 in), restore the protective treatment by dichromate treatment.

(a) Reworking of the dia. K bore

- Remachine the bore until the defects have completely disappeared, in accordance with the instructions given on the figure. Deburr the edges.

CAUTION : THE REMACHINING OF THE DIA. K BORE MUST REMAIN WITHIN THE FOLLOWING LIMITS :
70 mm (2.756 in) MIN AND 70,9 mm (2.791 in) MAX.

- Protect the dia. K bore by dichromate treatment only.

(b) Measure the exact value of diameter K.

(c) Fitment of a bush in the dia. K bore

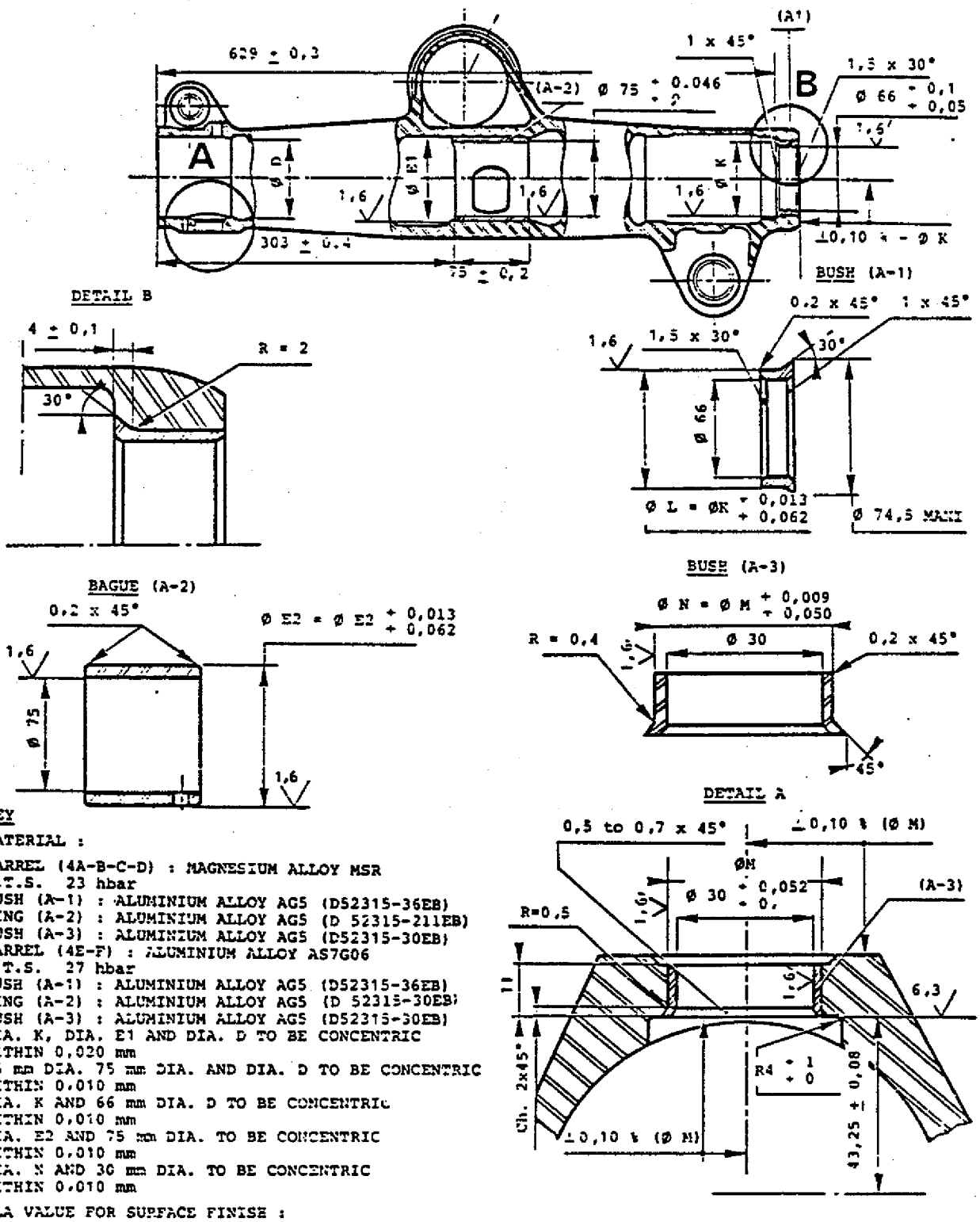
- Rework the external diameter (dia. L) of a bush (A-1) to suit the exact measured value of dia. K, to obtain an assembly which conforms with the figure.

- Machine the chamfer which accepts the flange of bush (A-1) to the dimensions given on the figure (maximum diameter of the flange : 74,5 mm (2.933 in).

(d) Protect the remachined surfaces of the bush by the application of ALODINE 1200.

(e) Coat the dia. K bore with LOCTITE no 675.

(f) Cool bush (A-1) in liquid nitrogen, then insert it in the dia. K bore from the inner face of the barrel, with its flange properly seated (see figure.



KEY

MATERIAL :

BARREL (4A-B-C-D) : MAGNESIUM ALLOY MSR
U.T.S. 23 hbar
BUSH (A-1) : ALUMINIUM ALLOY AG5 (D52315-36EB)
RING (A-2) : ALUMINIUM ALLOY AG5 (D 52315-211EB)
BUSH (A-3) : ALUMINIUM ALLOY AG5 (D52315-30EB)
BARREL (4E-F) : ALUMINIUM ALLOY AS7G06
U.T.S. 27 hbar
BUSH (A-1) : ALUMINIUM ALLOY AG5 (D52315-36EB)
RING (A-2) : ALUMINIUM ALLOY AG5 (D 52315-30EB)
BUSH (A-3) : ALUMINIUM ALLOY AG5 (D52315-30EB)
DIA. K, DIA. E1 AND DIA. D TO BE CONCENTRIC WITHIN 0,020 mm
66 mm DIA. 75 mm DIA. AND DIA. D TO BE CONCENTRIC WITHIN 0.010 mm
DIA. K AND 66 mm DIA. D TO BE CONCENTRIC WITHIN 0,010 mm
DIA. E2 AND 75 mm DIA. TO BE CONCENTRIC WITHIN 0.010 mm
DIA. N AND 30 mm DIA. TO BE CONCENTRIC WITHIN 0.010 mm

CLA VALUE FOR SURFACE FINISE :

1,6 = 1,6 MICRON = 62 MICROINCHES

6,3 = 6,3 MICRONS = 250 MICROINCHES

Repair of barrels
Figure 403

(g) Check the bore of the bush and its chamfers against the dimensions given on the figure.

(h) Apply a coat of post-primer of the Epoxy 200°C Pyrolac paint scheme inside the bore of bush (A-1).

(8) Reconditioning of the dia. E1 bore (figure 403)

NOTE : - The repair scheme for bushing the bore discribed below is recommended for replacing the remachining of dia. E, in paragraph (4).

- For a minor reworking of the bore to a diameter not greater than 75,046 mm (2.9546 in), restore the protective treatment by dichromate treatment.

(a) Reworking of the dia. E1 bore

- Remachine the bore until the defects have completely disappeared, in accordance with the instructions given on the figure. Deburr the edges.

CAUTION : THE REMACHINING OF THE DIA. E1 BORE MUST REMAIN WITHIN THE FOLLOWING LIMITS :
79 mm (3.110 in) MIN AND 79,9 mm (3.146 in) MAX.

- Protect the dia. E1 bore by dichromate treatment only.

(b) Measure the exact value of diameter E1.

(c) Fitment of a bush in the dia. E1 bore

- Rework the external diameter (dia. E2) of a bush (A-2) to suit the exact measured value of dia. E1, to obtain an assembly which conforms with the figure.

- Remachine the chamfers and remove sharp edges.

(d) Protect the remachined surfaces of the bush by the application of ALODINE 1200.

(e) Coat the dia. E1 bore with LOCTITE no 675.

(f) Cool bush (A-2) in liquid nitrogen, then insert it in the dia. E1 bore of the barrel (see figure).

(g) Check the bore of the bush against the dimensions given on the figure.

(h) Apply a coat of post-primer of the Epoxy 200°C Pyrolac paint scheme inside the bore of bush (A-2).

(9) Reconditioning of the dia. M bore (figure 403)

NOTE : For a minor reworking of the bore to a diameter not greater than 30,052 mm (1.1831 in), restore the protective treatment by dichromate treatment.

(a) Reworking of the dia. M bore.

- Remachine the bore until the defects have completely disappeared, in accordance with the instructions given on the figure. Deburr the edges.

CAUTION : THE REMACHINING OF THE DIA. M BORE MUST REMAIN WITHIN THE FOLLOWING LIMITS :
33 mm (1,299 in) MIN AND 33,6 mm (1.323 in) MAX.

- Machine the chamfer which accepts the flange of bush (A-3) to the dimensions given on the figure.

- Protect the dia. M bore by dichromate treatment only.

(b) Measure the exact value of diameter M.

(c) Fitment of a bush in the dia. M bore

- Rework the external diameter (dia. N) of a bush (A-3) to suit the exact measured value of dia. M, to obtain an assembly which conforms with the figure.

- Remachine the flange of the bush to the dimensions given on the figure.

(d) Protect the remachined surfaces of the bush by the application of ALODINE 1200.

(e) Coat the dia. M bore with LOCTITE no 675.

(f) Cool bush (A-3) in liquid nitrogen, then insert it in the dia. M bore of the barrel, with its flange properly seated (see figure).

(g) Check the bore of the bush and its entry chamfer against the dimensions given on the figure.

(h) Apply a coat of post-primer of the Epoxy 200°C Pyrolac paint scheme inside the bore of bush (A-3).

(10) Replacement, if necessary, of bushing (278 A-B) (figures 1101 and 404)

(a) Remove the bushing and discard washer (279) (figure 1102).

(b) Reworking of the dia. D1 bore

- Remachine the bore until the defects have disappeared (see NOTE), in accordance with the instructions given on the figure.

<u>CAUTION</u> : MAX. VALUE OF DIAMETER D1 AFTER MACHINING : 86,2 mm (3.394 in).

- Make sure that the minimum wall thickness is maintained.

- Rework the internal face of the barrel if necessary, maintaining the dimension of 313 ± 0,3 mm (12.323 ± 0.013 in) shown on the figure.

- Remachine the entry chamfer on the bore, and remove sharp edges.

<u>NOTE</u> : It is not essential that all defects be removed from the bore. So long as those remaining do not exceed a total surface area of 2 cm2 (0.31 in2) per half-circumference, they may be removed by abrasion until sound metal is revealed. They must then be radiused to remove any sharp edges and, after neutralisation and protective treatment, sealed with ARALDITE.

(c) Protect the remachined surfaces by dichromate treatment and by the application of a coat of post-primer of the Epoxy 200°C paint scheme.

(d) Measure the exact value of the dia. D1 bore in the barrel.

(e) Fitment of a bushing in the dia. D1 bore

- Rework the external diameter (dia. D2) of a blank bushing (278 A-B) to suit the exact measured value of the bore of the barrel, to obtain an assembly which conforms to the figure.

- Remachine the chamfer and the radius, and remove sharp edges.

(f) Protect the remachined surfaces of the bushing by the application of ALODINE 1200.

(g) Cool the bushing in liquid nitrogen, then insert it in the dia. D1 bore of the barrel, maintaining the correct hole positions.

(h) Remachine the bore of the bushing if necessary, to the dimensions given on the figure.

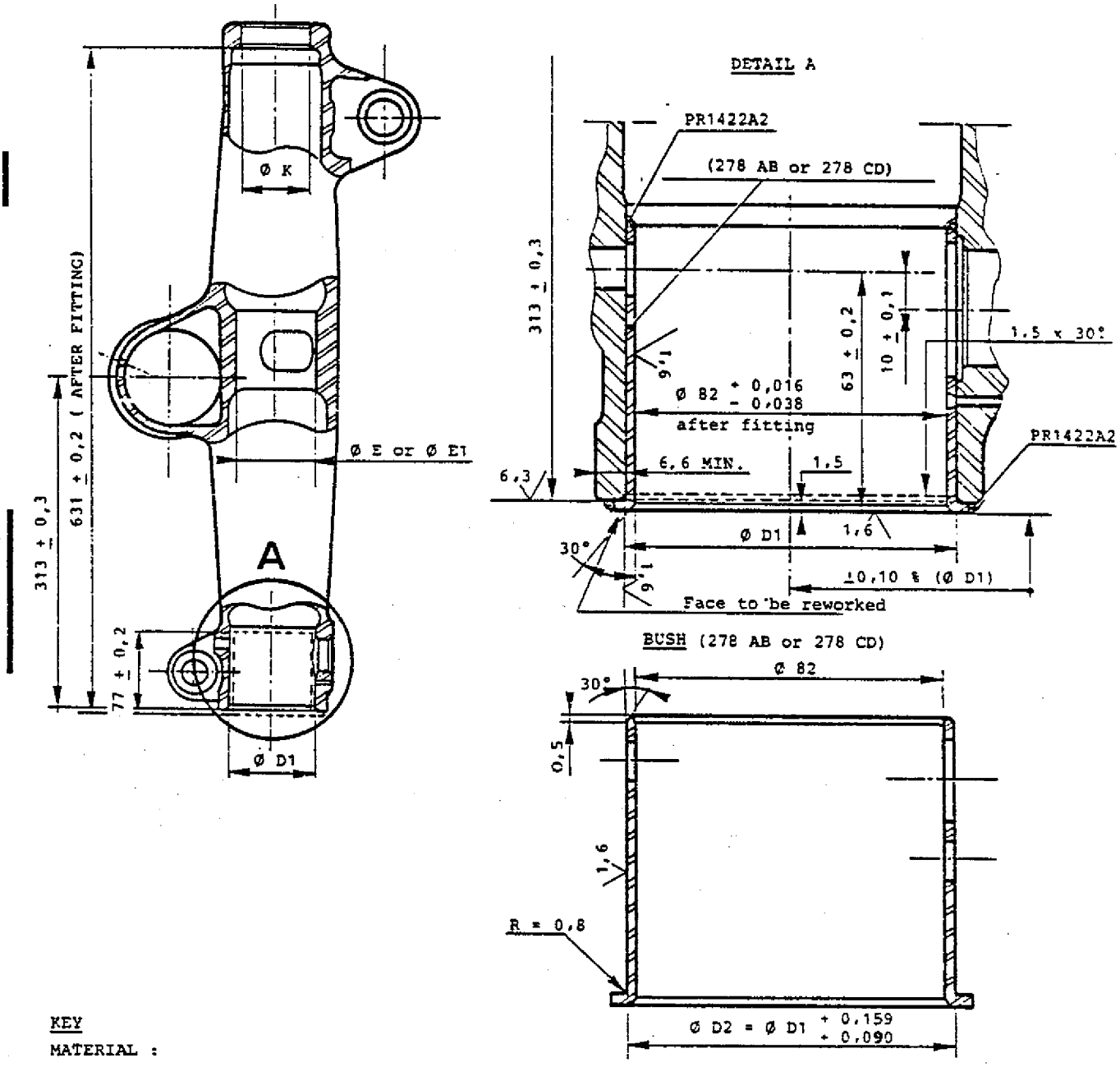
(i) Remachine the flange of the bushing if necessary, in accordance with the instructions given on the figure, maintaining the dimension of 631 $\pm$ 0,2 mm (24.843 $\pm$ 0.008 in).

(j) Remachine the entry chamfer on the bushing to the dimension given on the figure, and remove sharp edges.

(k) Protect the remachined surfaces of the bushing by the application of ALODINE 1200.

(l) Cover the jointing lines between the bushing and the barrel with a bead of PR1422A2 liquid rubber sealant (see figure).

NOTE : The remachining of the dia. D1 bore in the barrel and the fitment of a bushing (278 A-B) requires that, on reassembly, a base (47 A-B) only be fitted (figure 1102).



KEY

MATERIAL :

BARREL (4A.B.C.D.) : MAGNESIUM ALLOY MSR - U.T.S. ≥ 23 hbar
BUSH (278A.B.) ALUMINIUM ALLOY AU4G1
BARREL (4E.F.) : ALUMINIUM ALLOY AS7G06 - U.T.S. ≥ 27 hbar
BUSH (278C.D.) ALUMINIUM ALLOY AU5G1
- DIA. K, DIA. E AND DIA. D1 TO BE CONCENTRIC WITHIN 0,02 mm
- DIA. D2 ANS 82 DIA. TO BE CONCENTRIC WITHIN 0/01 mm

CLA VALUES FOR SURFACE FINISH :

$\sqrt{1,6}$ = 1,6 MICRON = 63 MICROINCHES

$\sqrt{6,3}$ = 6,3 MICRONS = 250 MICROINCHES

Repair of barrels
Figure 404

B. Repair of barrel (4 E-F) (figure 401)

(1) Replacement, if necessary, of bushings (5 C-D) (see figure 1101)

- Proceed in the same manner as for bushings (5 A-B), paragraph A.(1).

R CAUTION : EACH TIME THE BARREL IS REBORED, PROTECT THE REWORKED SURFACES BY THE APPLICATION OF ALODINE 1200.

NOTE : Before bushings (5 C-D) are fitted, coat the dia. A bores in the barrel and the counterbores for the flanges of the bushings with MASTINOX 6856K.

(2) Replacement, if necessary, of bushings (6 C-D) (see figure 1101)

- Proceed in the same manner as for bushings (6 A-B), paragraph A.(2).

- Apply protective treatment to the dia. B bores.

NOTE : Before bushings (6 C-D) are fitted, coat the counterbores in the barrel for the flanges of the bushings only with MASTINOX 6856K.

(3) Replacement, if necessary, of bushings (7 C-D) (figure 1101) and adjustment of the thickness of washer (83) (figure 1102)

R - Proceed in the same manner as for bushings (7 C-D), paragraph A.(3).

- Apply protective treatment to the dia. C bores.

- Adjust the thickness of washer (83) as described in paragraph A.(3).

(4) Reconditioning of the dia. E1 bore (figure 403)

R CAUTION : The repair scheme for bushing the dia. E1 bore described below is recommended only for replacing the reworking of the dia. E bore, described in paragraph A.(4), for barrel (4 A-B-C-D).

NOTE : For a minor reworking of the bore to a diameter not greater than 75,046 mm (2.9546 in), restore the protective treatment by the application of ALODINE 1200.

- Proceed in the same manner as for the dia. E1 bore in barrel (4 A-B-C-D), paragraph A.(8).

- Apply protective treatment to the dia. E1 bore.

- Prepare a bush (A-2), in the same way as was described in paragraph A.(8), for the reconditioning of the dia. E1 bore.

- After fitment of bush (A-2), apply a coat of post-primer of the series 4080 CELOMER anti-ester paint scheme to the inside of its bore.

(5) Reconditioning of the dia. F bore (figure 401)

- Proceed in the same manner as for the dia. F bore in barrel (4 A-B-C-D), paragraph A.(5).

- Apply protective treatment to the dia. F bore.

R - Prepare a bush (A-2), in the same way as was described in paragraph A.(5), for the reconditioning of the dia. F bore.

R - After fitment of bush (A-2), apply a coat of post-primer of the series 4080 CELOMER anti-ester paint scheme to the inside of its bore.

(6) Reconditioning of the dia. H bore (figure 402)

- Proceed in the same manner as for the dia. H bore in barrel (4 A-B-C-D), paragraph A.(6).

- Apply protective treatment to the dia. H bore.

R - Prepare a bush (A-2), in the same way as was described in paragraph A.(6), for the reconditioning of the dia. H bore.

R - After fitment of bush (A-2), apply a coat of post-primer of the series 4080 CELOMER anti-ester paint scheme to the inside of its bore.

(7) Reconditioning of the dia. K bore (figure 403)

- Proceed in the same manner as for the dia. K bore in barrel (4 A-B-C-D), paragraph A.(7).
- Apply protective treatment ot the dia. K bore.
- Prepare a bush (A-1), in the same way as was described in paragraph A.(7), for the reconditioning of the dia. K bores.
- After fitment of bush (A-1), apply a coat of post-primer of the series 4080 CELOMER anti-ester paint scheme to the inside of its bore.

(8) Reconditioning of the dia. M bore (figure 403)

- Proceed in the same manner as for the dia. M bore in barrel (4 A-B-C-D), paragraph A.(9).
- Apply protective treatment to the dia. M bore.
- Prepare a bush (A-3), in the same way as was described in paragraph A.(9), for the reconditioning of the dia. M bore.
- After fitment of bush (A-3), apply a coat of post-primer of the series 4080 CELOMER anti-ester paint scheme to the inside of its bore.

(9) Replacement, if necessary, of bushing (278 CD) (figure 1101)

- Remove the bushing.
- Proceed in the same manner as for bushing (278 A-B), paragraph A.(10).
- Apply protective treatment to the dia. D1 bore.
- Prepare a blank bushing (278 C-D), in the same way as was described in paragraph A.(10), for the reconditioning of the dia. D1 bore.
- On the diameter D2 of the bush (278 CD) spread a of anti ester serie 4080 primer coat.

NOTE : Before bushing (278 C-D) is fitted, cool the dia. D1 bore and the face of the barrel forming the seat for the flange of the bushing with MASTINOX 6856K.

- The remachining of the dia. D1 bore in the barrel requires that, on reassembly, a base (47 A-B) only be fitted (figure 1102).

C. Repair of the sliding rod (figure 405)

(1) Remachining of the dia. A bore

(a) If damage is present, rebore to the repair dimension in the table in paragraph 3 which results in the removal of the defect.

(b) Remove sharp edges from the chamfers.

NOTE : This operation requires the fitment of a piston (143) to the corresponding repair dimension (figure 1104).

(2) Restoration of the dia. A bore by chromium-plating

NOTE : This procedure is recommended only in the case of persistent defects (scratches, corrosion), after dia. A has been rebored to the repair dimension R5.

(a) Remachine the dia. A bore to 48,640 mm (1.9150 in) maximum.

(b) Apply Type III oversize hard chromium-plating, suitable for high tensile steels, to the dia. A bore.

(c) Grind the dia. A bore to obtain a finished diameter of $48{,}500 \begin{smallmatrix} +0{,}039 \\ +0 \end{smallmatrix}$ mm ($1.9094 \begin{smallmatrix} +0.0015 \\ +0 \end{smallmatrix}$ in).

Remove sharp edges.

(3) Remachining of the dia. B bore

(a) If necessary, rebore to the repair dimension in the table in paragraph 3 which results in the removal of the defect.

(b) Remove sharp edges from the chamfers.

NOTE : This operation requires the fitment of pistons (131) and (167) and bottom base (164) to the corresponding repair dimensions (figure 1104).

CAUTION : AFTER THE FITMENT OF THE SLIDING ROD INTO AXLE POT (92), THE BORE "B" IS TO BE LAPPED AND POLISHED (FIGURE 1103).

(4) Rechroming (diameters C and D)

NOTE : This operation is to be carried out only if the chromium-plating has been damaged.

(a) Strip the chromium-plating.

(b) If impact damage or scoring is present, lightly grind diameters C and D, not exceeding the following minima :

- diameter C = 54,294 mm (2.1376 in).

- diameter D = 64,794 mm (2.5509 in).

(c) Rechrome by applying Type III oversize hard chromium-plating, suitable for high tensile steel, leaving a minimum chrome thickness of 0,190 mm (0.0075 in).

(d) Grind to the following finished dimensions :

- Diameter C : $54{,}5\ ^{-\ 0{,}030}_{-\ 0{,}060}$ mm ($2.146\ ^{-\ 0.0012}_{-\ 0.0024}$ in),

over the length shown on the figure only.

- Diameter D : $65\ ^{-\ 0{,}030}_{-\ 0{,}060}$ mm ($2.560\ ^{-\ 0.0012}_{-\ 0.0024}$ in).

(e) Grind off any chrome which has been deposited in the entry to the dia. F bores.

REMARK : If a sliding rod has to be replaced, refer to paragraph K which deals with this case.

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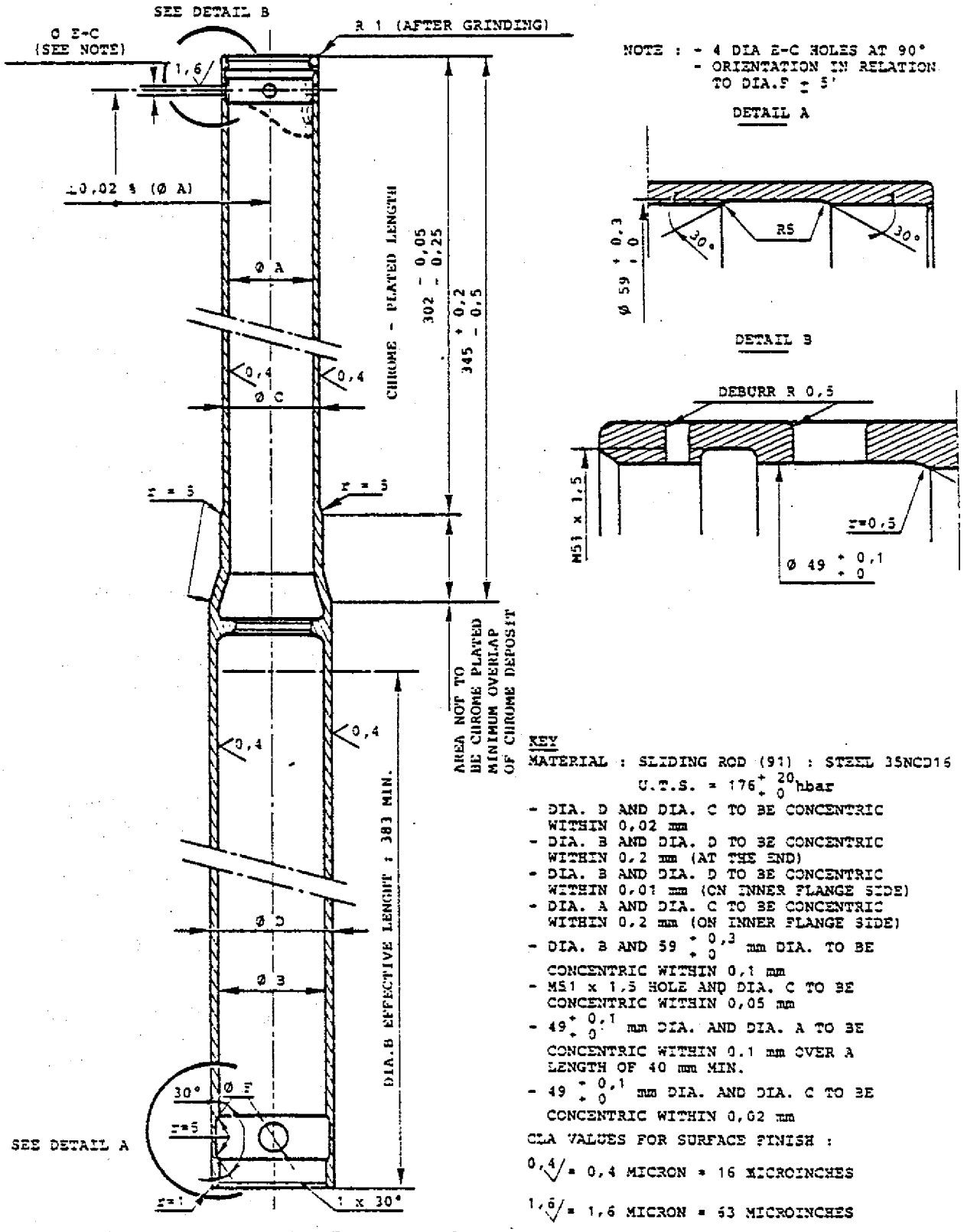


KEY

MATERIAL : SLIDING ROD (91) : STEEL 35NCD16

U.T.S. = 176^{+20}_{+0} hbar

- DIA. D AND DIA. C TO BE CONCENTRIC WITHIN 0,02 mm
- DIA. B AND DIA. D TO BE CONCENTRIC WITHIN 0,2 mm (AT THE END)
- DIA. B AND DIA. D TO BE CONCENTRIC WITHIN 0,01 mm (ON INNER FLANGE SIDE)
- DIA. A AND DIA. C TO BE CONCENTRIC WITHIN 0,2 mm (ON INNER FLANGE SIDE)
- DIA. B AND $59^{+0,3}_{+0}$ mm DIA. TO BE CONCENTRIC WITHIN 0,1 mm
- M51 x 1,5 HOLE AND DIA. C TO BE CONCENTRIC WITHIN 0,05 mm
- $49^{+0,1}_{+0}$ mm DIA. AND DIA. A TO BE CONCENTRIC WITHIN 0.1 mm OVER A LENGTH OF 40 mm MIN.
- $49^{+0,1}_{+0}$ mm DIA. AND DIA. C TO BE CONCENTRIC WITHIN 0,02 mm

CLA VALUES FOR SURFACE FINISH :

$0,4\sqrt{}$ = 0,4 MICRON = 16 MICROINCHES

$1,6\sqrt{}$ = 1,6 MICRON = 63 MICROINCHES

Repair of sliding rod

Figure 405

(5) Reworking, if necessary, of the dia. F bores - see paragraph K.

D. Repair of the axle pot (figure 406)

(1) Replacement, if necessary, of bushes (93) (figure 1103)

CAUTION : EACH TIME THE AXLE POT IS REBORED, PROTECT THE REMACHINED SURFACES BY THE APPLICATION OF ALODINE 1200 AND PAINT, EXCEPT IN THE DIA. F BORES, AS INDICATED IN PARAGRAPH C.(2) OF THE SECTION "PROTECTIVE TREATMENT".

(a) Remove the bushes.

(b) If necessary, remachine the dia. A and B bores in accordance with the instructions given on the figure.

- Rebore in line to the repair dimension in the table in paragraph 3 which results in the removal of the defect.

- Rework the entry chamfer.

- Apply protective treatment to the remachined surfaces.

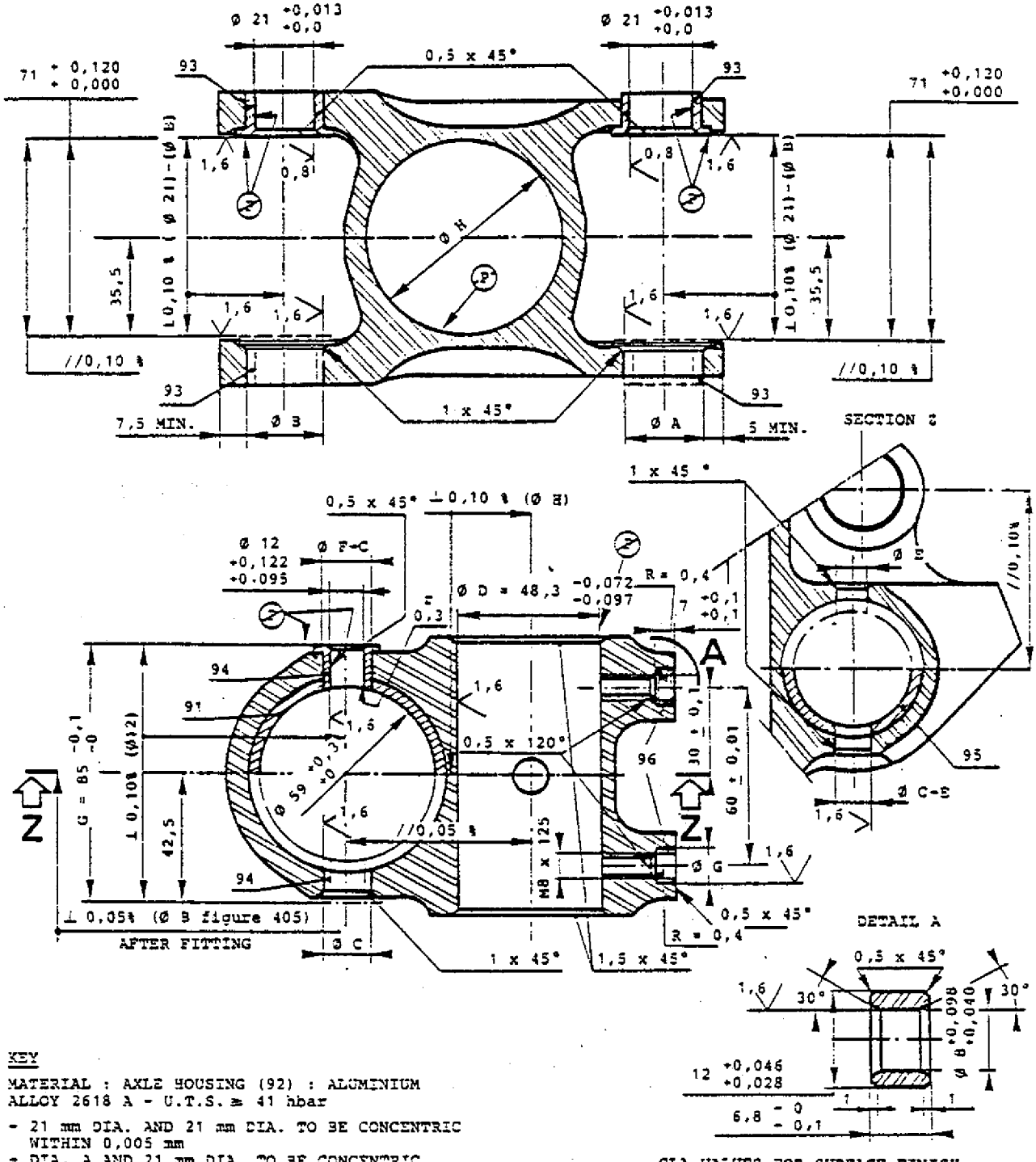
NOTE : The remachining requires the fitment of two bushes (93) to the corresponding repair dimension.

(c) Shrink fit the bushes

- Cool the bushes in liquid nitrogen, then insert them into the holes from the inner faces of the lugs.
Hold them in position until they have returned to ambient temperature.

(d) Remachine the bushes in accordance with the instructions given on the figure :

NOTE : Two of these bushes form part of the pivot for the lower torque arm, and must be matched. Their reboring will be determined by one of the repair conditions for the pivot which are defined in paragraph F.



KEY

MATERIAL : AXLE HOUSING (92) : ALUMINIUM ALLOY 2618 A - U.T.S. ≥ 41 hbar

- 21 mm DIA. AND 21 mm DIA. TO BE CONCENTRIC WITHIN 0,005 mm
- DIA. A AND 21 mm DIA. TO BE CONCENTRIC WITHIN 0,005 mm
- DIA. B AND DIA. D (FIG. 405 AFTER FITTING) TO BE CONCENTRIC WITHIN 0,1 mm
- DIA. D AND DIA. C-E TO BE SQUARE WITHIN 0,062 mm
- 12 mm DIA. AND DIA. B TO BE SQUARE WITHIN 0,02 mm

CLA VALUES FOR SURFACE FINISH :

0,8 = 0,8 MICRON = 32 MICROINCHES

1,6 = 1,6 MICRON = 63 MICROINCHES

Repair of axle housing

Figure 406

- Rebore in line.

- Rework the bush flanges to obtain the correct distance between them.

- Rework the chamfers.

- Carefully deburr the edges of the lubrication grooves.

(2) Reworking, if necessary, of the dia. C bores - see paragraph K.

(3) Reworking, if necessary, of the dia. D bore

(a) Remachine the bore until the defect has disappeared taking care not to exceed the dimension given on the figure.

(b) Rework the entry chamfers and deburr carefully.

(c) Apply protective treatment to the remachined surfaces.

NOTE : The remachining requires the fitment of an axle (95) in the form of a blank (figure 1103).

(4) Reworking, if necessary, of the dia. E bore - see paragraph L.

(5) Replacement, if necessary, of bushes (96)

(a) Remove the bushes

- The bushes can be removed by using a threaded rod, after tapping their bores.

(b) If necessary, remachine the dia. G bores in accordance with the instructions given on the figure.

- Rebore to the repair dimension in the table in paragraph 3 which results in the removal of the defect.

NOTE : Maintain the boring depth shown on the figure to avoid breaking into the threaded portion.

- Rework the entry chamfers.

- Apply protective treatment to the remachined surfaces.

NOTE : The remachining requires the fitment of two bushes (96) to the corresponding repair dimensions.

(c) Shrink fit the bushes :

- Cool the bushes in liquid nitrogen, then insert them and push them fully home in their holes. Hold them in position until they have returned to ambient temperature.

(d) Remachine the bushes in accordance with the instructions given on the figure.

- Rebore the bushes in accordance with the instructions given on the figure.

- Remachine their ends if necessary to make them flush with the axle pot.

- Rework the entry chamfers and deburr carefully.

(6) Reconditioning of the dia. F bore (figure 407)

R (a) Remachine the bore to obtain the dimension of

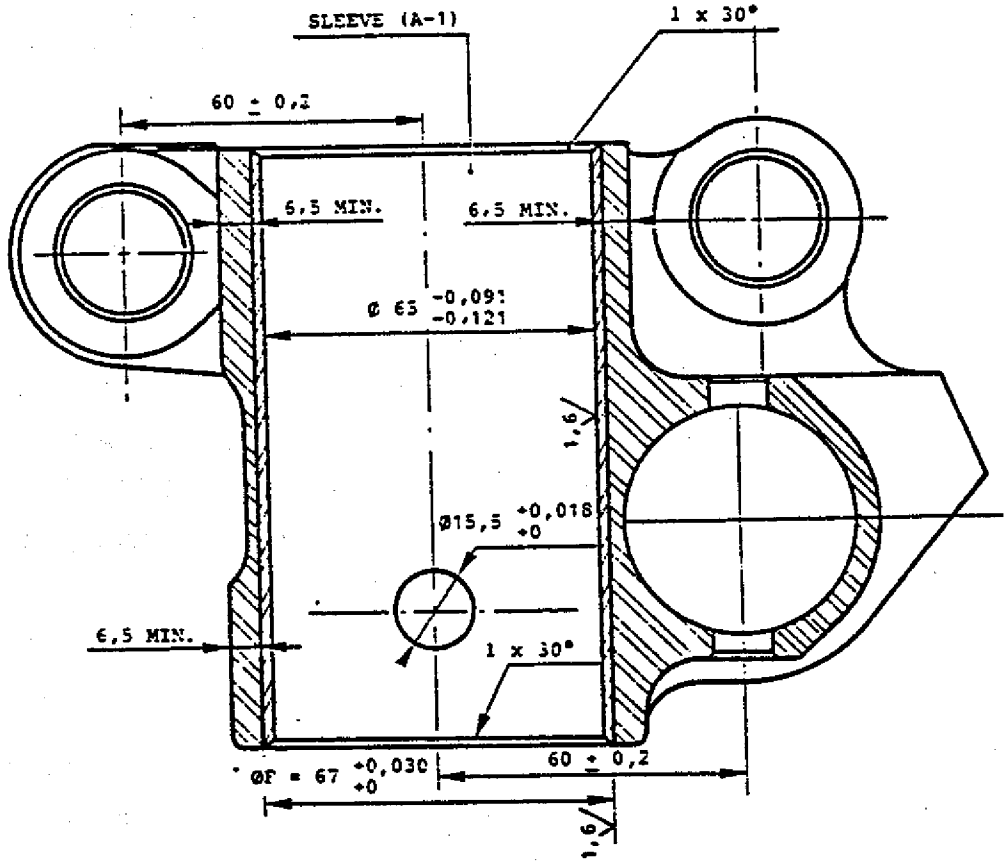
$67 \begin{smallmatrix} +0{,}030 \\ +0 \end{smallmatrix}$ mm ($2.638 \begin{smallmatrix} +0.0012 \\ +0 \end{smallmatrix}$ in).

(b) Protect the remachined surfaces by the application of ALODINE 1200.

(c) Bushing of the dia. F bore

- Coat the dia. F bore in which liner (A-1) is to be fitted with LOCTITE no 675.

R - Cool liner (A-1) in liquid nitrogen, then insert it in the axle pot, with the 1 x 30° chamfers on its bore flush with the external faces of the axle pot.



KEY

MATERIAL :

SLEEVE (A-1) (D52615-43) AND AXLE HOUSING (92) : ALUMINIUM ALLOY 2618A - U.T.S. ≥ 41 hbar

67 mm DIA. AND 15.5 mm DIA. TO BE SQUARE WITHIN 0.020 mm

15.5 mm DIA. AND DIA. D (FIG. 406) TO BE PARALLEL WITHIN 0.05 ℄

CLA VALUES FOR SURFACE FINISH :

1.6 √ = 1.6 MICRON = 63 MICROINCHES

Repair of axle housing
Figure 407

(d) After fitment, drill the liner to the size required to mate with bushes (94) (dia. C), 15,5 $^{+\ 0,018}_{+\ 0}$ mm ($0.610\ ^{+\ 0.0007}_{+\ 0}$ in) (figure 1103), and deburr carefully.

NOTE : For the reworking of the dia. C bores, refer to paragraph K.

(e) Check the bore of the liner and its entry chamfers against the dimensions given on figure 407.

(f) Apply a coat of primer of the series 4080 CELOMER anti-ester paint scheme inside the bore of the liner (A-1) through which the sliding rod passes.

E. Repair of torque arms (figure 408)

Replacement, if necessary, of bushings (13) (figure 1101) and of bushes (104) (figure 1103)

(a) Remove the bushings/bushes.

(b) If necessary, remachine the dia. A bores in accordance with the instructions given on the figure :

- Rebore in line to the repair dimension in the table in paragraph 3 which results in the removal of the defect.
- Rework the entry chamfer.
- Protect the remachined surfaces by the application of ALODINE 1200 and paint, as indicated in paragraph C.(2) of the section "Protective treatment".

NOTE : The remachining requires the fitment of bushes (104) or bushings (13) to the corresponding repair dimensions.

(c) Shrink fit the bushings/bushes

- Cool the bushings/bushes in liquid nitrogen, then insert them in the bores from the outer faces of the lugs.
  Hold them in position until they have returned to ambient temperature.

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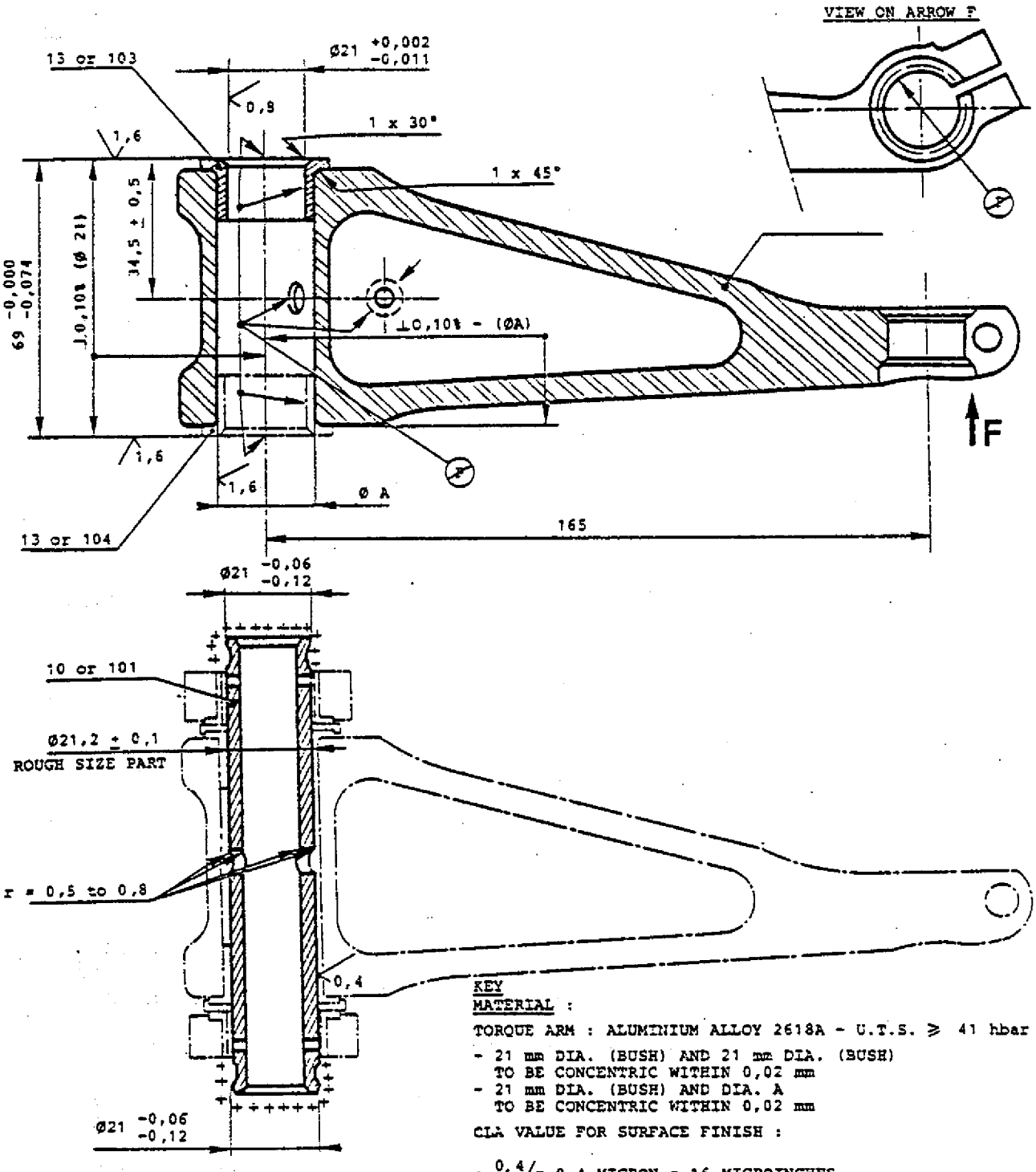


KEY

MATERIAL :

TORQUE ARM : ALUMINIUM ALLOY 2618A - U.T.S. ⩾ 41 hbar

- 21 mm DIA. (BUSH) AND 21 mm DIA. (BUSH) TO BE CONCENTRIC WITHIN 0,02 mm
- 21 mm DIA. (BUSH) AND DIA. A TO BE CONCENTRIC WITHIN 0,02 mm

CLA VALUE FOR SURFACE FINISH :

- $^{0,4}\!\surd$ = 0,4 MICRON = 16 MICROINCHES
- $^{0,8}\!\surd$ = 0,8 MICRON = 32 MICROINCHES
- $^{1,6}\!\surd$ = 1,6 MICRON = 63 MICROINCHES

Repair of attachment areas and torque arms
Figure 408

(d) Remachine the bushings/bushes in accordance with the instructions given on the figure.

NOTE : These bushings/bushes form part of the pivot between the torque arms, and must be matched. Their reboring will be determined by one of the repair conditions for the pivot which are defined in paragraph F.

- Rebore in line as defined in the NOTE.

- Rework the faces of the flanges to obtain the correct distance between them.

- Rework the chamfers.

F. Repair of lower or upper torque arm pivot (figure 408)

NOTE : Since the parts forming each pivot must be matched on assembly, carry out the machining operations on the bushes and pins in accordance with one of the schemes described below :

(1) Pin (10) (figure 1101) or (101) (figure 1103) refitted

(a) If necessary, lightly grind the pin to be refitted and protect it by chemical burnishing and painting as indicated in paragraph C.(2) of the section "Protective treatment".

(b) Rebore the bushed lugs on the barrel or the axle pot in line to suit the diameter of the pin to be refitted, and to provide a matched fit between 0,009 and 0,022 mm (0.00035 and 0.00087 in), while remaining within the rebore tolerances for the bushes fitted to these lugs (see figures 401 and 406).

(c) Rebore the bushes in the torque arm in line to suit the diameter of the pin to be refitted, and to provide a matched fit between 0,000 and 0.009 mm (0.000 and 0.00035 in), while remaining within the rebore tolerances for the bushes shown on the figure.

(2) New pin (10) or (101) (blank)

(a) Rebore the bushed lugs on the barrel (figure 401) or the axle pot (figure 406) in line.

(b) Rebore the bushes in torque arm (12) or (104) in line (figure 408).

(c) Grind the pin blank in accordance with the instructions given on the figure.

- Measure the sizes of the resultant bores and hence calculate the pin diameter required to achieve a matched fit of :

  . 0,009 to 0,022 mm (0.00035 to 0.00087 in) between the pin and the bushed lugs on the barrel or the axle pot.

  . 0,000 to 0,009 mm (0.000 to 0.00035 in) between the pin and the bush in the torque arm.

(d) Deburr the edges carefully.

(e) Protect the pin by chemical burnishing and painting as indicated in paragraph C.(2) of the section "Protective treatment".

G. Repair of the axle (figure 409)

(1) Rechroming

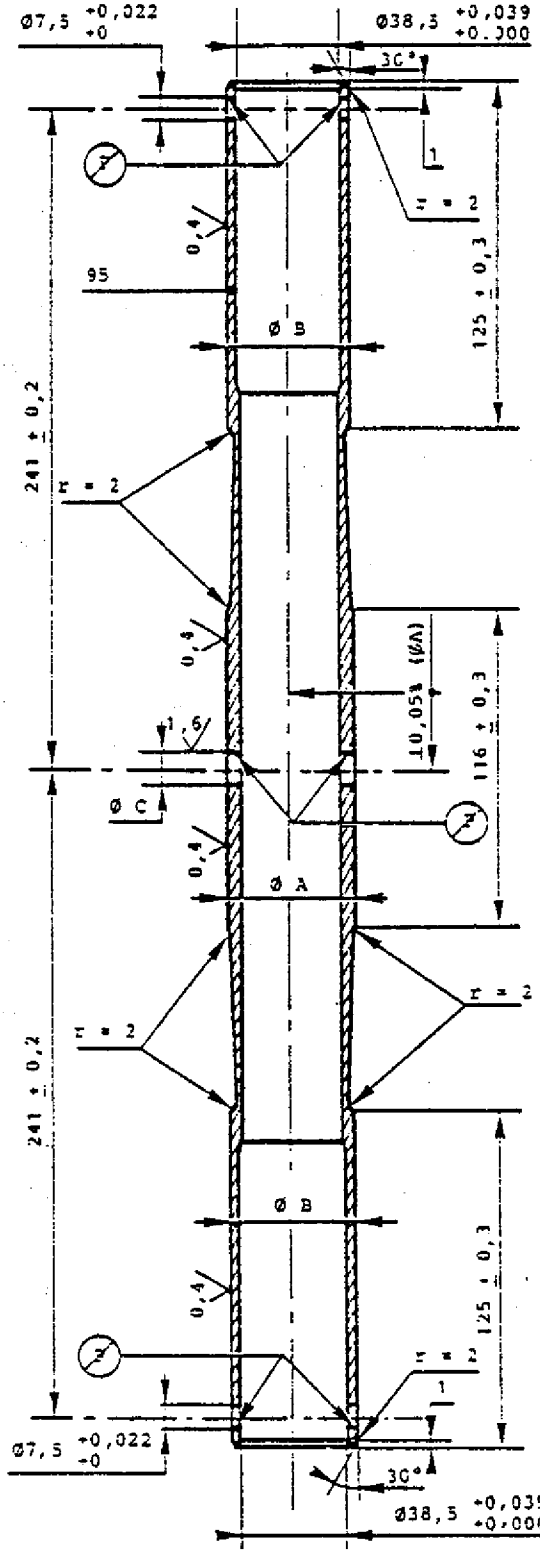
NOTE : This operation is required only if the chromium-plating has been damaged, and if the diameter D on the axle pot (figure 406) has not been re-machined.

(a) Strip the chromium-plating.

(b) If impact damage or scoring is present, lightly grind diameters A and B, not exceeding the following minima :

- diameter A : 46,870 mm (1.8453 in).

- diameter B : 43,310 mm (1.7051 in).



KEY

MATERIAL :

AXLE (95) : STEEL 35NCD16
U.T.S. = 123 to 137 hbar

- DIA. A AND DIA. B TO BE CONCENTRIC WITHIN 0.010 mm
- DIA. B AND 38.5 mm DIA. TO BE CONCENTRIC WITHIN 0.02 mm
- DIA. C AND DIA. A TO BE SQUARE WITHIN 0.02 mm

CLA VALUES FOR SURFACE FINISH :

- $\sqrt{0.4}$ = 0.4 MICRON = 16 MICROINCHES
- $\sqrt{1.6}$ = 1.6 MICRON = 63 MICROINCHES

Repair of axle

Figure 409

(c) Rechrome by applying Type III oversize chromium-plating, to a minimum thickness of 0,160 mm (0.0063 in).

(d) Grind in accordance with the instructions given on the figure, to the following finished dimensions :

- diameter A : $47 \begin{smallmatrix} - 0,025 \\ - 0,050 \end{smallmatrix}$ mm ($1.850 \begin{smallmatrix} - 0.0010 \\ - 0.0020 \end{smallmatrix}$ in)
- diameter B : $43,5 \begin{smallmatrix} - 0,025 \\ - 0,050 \end{smallmatrix}$ mm ($1.713 \begin{smallmatrix} - 0.0010 \\ - 0.0020 \end{smallmatrix}$ in)

NOTE : Grind off any chrome which has been deposited in the entry to each dia. C bore.

(e) Restore the protective treatment on the non-chromium-plated surfaces by phosphating.

(2) Reworking, if necessary, of the dia. C bores - see paragraph L.

(3) Remachining (for an axle in the form of a blank)

NOTE : The remachining of dia. D on an axle pot requires the fitment of an axle in the form of a blank, on which the machined dimensions for diameter A will be dependent on the actual dimension of the bore of the axle pot.

(a) Drill the dia. C hole to a dimension of :

$11 \begin{smallmatrix} + 0,27 \\ + 0,0 \end{smallmatrix}$ mm ($0.43 \begin{smallmatrix} + 0.011 \\ + 0.0 \end{smallmatrix}$ in), maintaining its orientation to within $\pm$ 2° of the $7,5 \begin{smallmatrix} + 0,022 \\ + 0 \end{smallmatrix}$ mm ($0.295 \begin{smallmatrix} + 0.00087 \\ + 0 \end{smallmatrix}$ in) dia. holes at each end of the axle. Deburr carefully.

(b) Machine the diameter A of the axle to the actual size of the dia. D bore of the axle pot

$\begin{smallmatrix} - 0,053 \\ - 0,117 \end{smallmatrix}$ mm ($\begin{smallmatrix} - 0.00209 \\ - 0.00461 \end{smallmatrix}$ in), following the instructions given on the figure.

(c) Rechrome by applying Type III oversize chromium-plating to a minimum thickness of 0,160 mm (0.0063 in).

(d) Grind in accordance with the instructions given on the figure, to the following finished dimensions :

- diameter A = actual diameter D of the axle pot bore increased by the tolerance $^{+\ 0,072}_{+\ 0,022}$ mm ($^{+\ 0.0028}_{+\ 0.0009}$ in).
- diameter D = 43,5 $^{-\ 0,025}_{-\ 0,050}$ mm (1.713 $^{-\ 0.0010}_{-\ 0.0020}$ in).

(e) Protect the non-chromium-plated surfaces of the axle by phosphating.

H. Repair of ball joint bearing assembly (38) (figures 410 and 1102).

(1) The bronze ball (40) only is damaged

(a) Note the letter engraved on the ball

NOTE : Either the letter A or B is engraved on the balls. The letters correspond to different machining tolerances for the spherical portion.

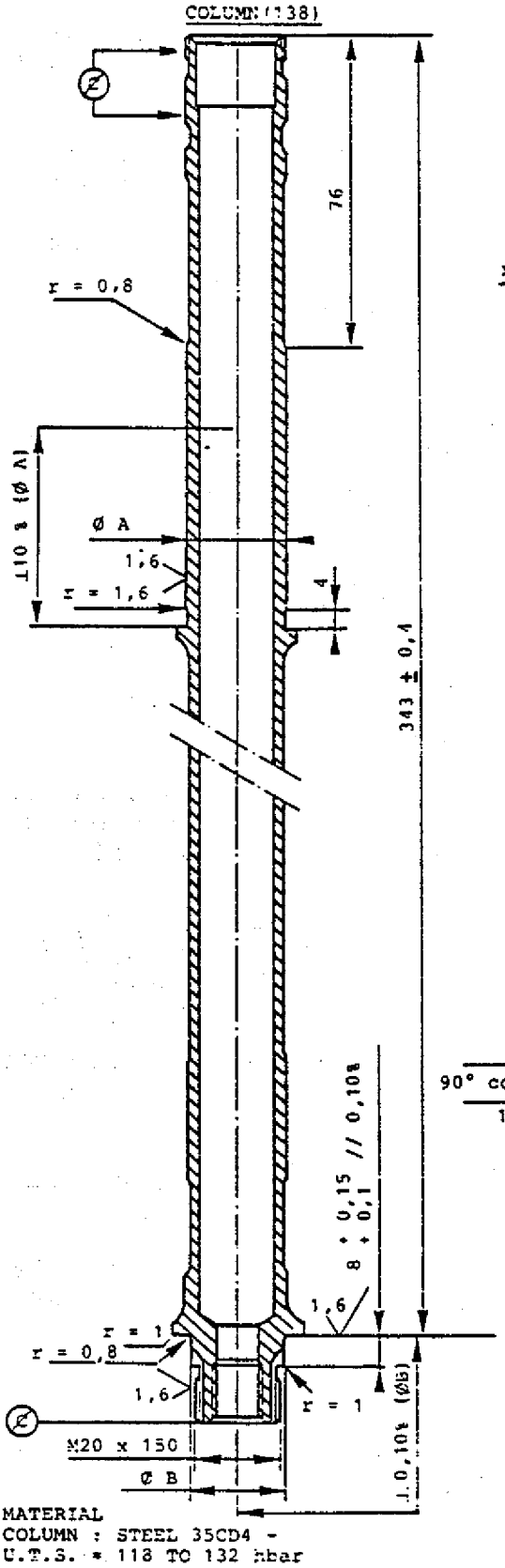
A = dia.72 $^{-\ 0}_{-\ 0,023}$mm (2.835 $^{-\ 0}_{-\ 0.00091}$ in).

B = dia.72 $^{-\ 0,023}_{-\ 0,046}$mm (2.835 $^{-\ 0.00091}_{-\ 0.00181}$ in).

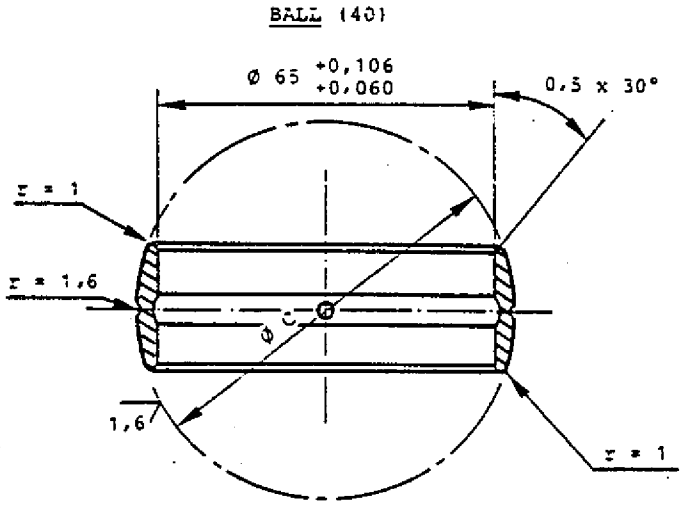
A letter A engraved on the ball corresponds to a letter A on the cage (39), and similarly for the letter B.

(b) Machine a blank ball, marked A or B, corresponding to that which was engraved on the old ball.

- Grind before chromium-plating to obtain the dia. C, ensuring that a minimum dimension of 71,708 mm (2.8232 in) is not exceeded.
- Apply Type II oversize chromium-plating to a minimum thickness of 0,246 mm (0.0097 in).



MATERIAL
COLUMN : STEEL 35CD4 -
U.T.S. = 118 TO 132 hbar

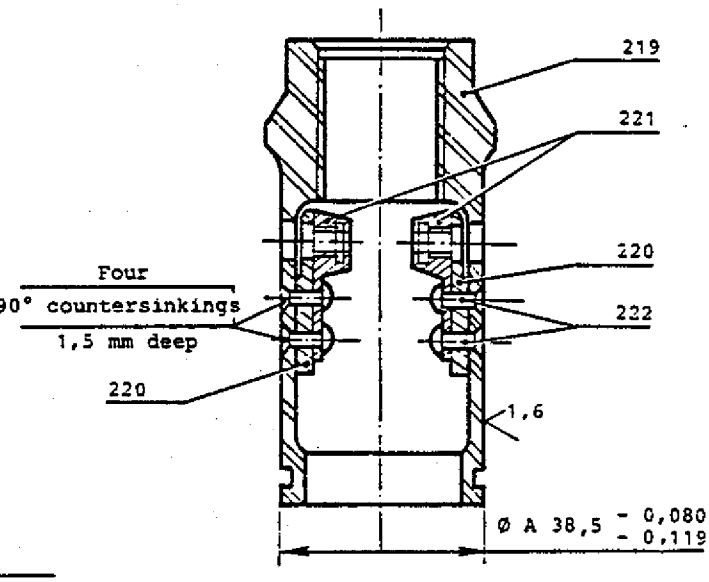


KEY
- DIA. C AND 65 mm DIA. TO BE CONCENTRIC WITHIN 0,02mm

CLA VALUES FOR SURFACE FINISH :

- $\overset{1,6}{\sqrt{}}$ = 1,6 MICRON = 63 MICROINCHES

MATERIAL :
BALL : BRONZE U-Z 19A6
U.T.S. = 83 TO 93 hbar



KEY

CLA VALUES FOR SURFACE FINISH :

$\overset{1,6}{\sqrt{}}$ = 1,6 MICRON = 63 MICROINCHES

MATERIAL :

SOCKET (219) : ALUMINIUM ALLOY 2024
U.T.S. 44 hbar

Repair
Figure 410

- Grind the spherical diameter C to obtain the final dimension :

  - For a ball marked A :

    dia. $72 \begin{smallmatrix} -0 \\ -0,023 \end{smallmatrix}$ mm ($2.835 \begin{smallmatrix} -0 \\ -0.00091 \end{smallmatrix}$ in).

  - For a ball marked B :

    dia. $72 \begin{smallmatrix} -0,023 \\ -0,046 \end{smallmatrix}$ mm ($2.835 \begin{smallmatrix} -0.00091 \\ -0.00181 \end{smallmatrix}$ in).

- After grinding (not more than one week later), apply stress relief treatment for 2 hours at a temperature of 190 ± 5°C (406 ± 41°F).

- Machine the radii and remove sharp edges with a stone.

(2) The ball (40) and cage (39) are damaged

- Replace the above parts, taking care to mate an A cage with an A ball.

CAUTION : IF THE DIA. D BORE IN THE BARREL HAS BEEN REMACHINED, USE A CAGE (39) TO THE CORRESPONDING REPAIR DIMENSION. (figure 401).

I. Repair of the column (figure 410)

Rechroming :

NOTE : This operation is required only if the chromium-plating has been damaged.

(1) Strip the cadmium-plating from the column.

(2) Strip the chromium-plating.

(3) If impact damage or scoring is present, lightly grind diameters A and E, not exceeding the following minima :

- diameter A = 24,827 mm (0.9764 in)

- diameter B = 22,907 mm (0.9018 in)

(4) Restore the dimension on the dia. B and the flange by applying Type I chromium-plating to a thickness of 0,020 to 0,025 mm (0.00079 to 0,00098 in), to obtain a finished dia. B of $23 \begin{smallmatrix} - 0,020 \\ - 0,053 \end{smallmatrix}$ mm ($0.9055 \begin{smallmatrix} - 0.0008 \\ - 0.0021 \end{smallmatrix}$ in).

(5) For the flange, refer to the instructions given on the figure.

(6) Apply Type III chromium-plating to dia. A, to a minimum thickness of 0,130 mm (0.0051 in).

(7) Grind dia. A in accordance with the instructions given on the figure, to obtain a finished dimension of dia.A of $25 \begin{smallmatrix} - 0,020 \\ - 0,041 \end{smallmatrix}$ mm ($0.9843 \begin{smallmatrix} - 0.0008 \\ - 0.0016 \end{smallmatrix}$ in).

(8) Remove sharp edges with a stone.

(9) Protect the column by the application of Cd5 cadmium-plating to the M20 x 150 threaded portion, and Cd10 cadmium-plating, except to the inside, the chromium-plated surfaces, and the surfaces marked Ø (see figure).

J. Repair, if necessary, of socket assemblies (218) (figures 410 and 1105)

(1) Drill off the heads of the 4 rivets (222).

(2) Drive out the rivets and collect the two nuts (221) and shims (220).

(3) Rework the counterbores if necessary.

(4) Restore the protective treatment on sockets (219) by the application of ALODINE 1200.

(5) Position shims (220) and nuts (221) correctly in the sockets and insert the rivets.

(6) Carry out the riveting operation, peening the ends of the rivets into the counterbores.

(7) Remove any excess metal left after riveting, to maintain the dia. A.

(8) Protect the remachined surfaces by the application of ALODINE 1200.

K. Fitment of sliding rod (91) in axle pot (129) (figures 405, 406 and 1103)

NOTE : Before assembly, protect the axle pot by the application of ALODINE 1200 and paint, as indicated in paragraph C.(2) of the section "Protective treatment".

(1) Heat the axle pot to a temperature of 100°C (212°F).

(2) Cool the end of the sliding rod in liquid nitrogen, then insert it so that it is flush with the bottom of the axle pot (protruding length of the sliding rod after insertion : 664 $\pm$ 0,2 mm (26.14 $\pm$ 0.0079 in)).

(3) Make sure that the dia. F (sliding rod) and dia. C (axle pot) holes are in perfect alignment, using pin 64313. Hold the assembly in position until it returns to ambient temperature.

NOTE : If the above requirement cannot be met (or if damage to these holes has been discovered during CHECKS), rebore the holes in line to allow repair size bushes (94) to be fitted (see table of repair dimensions in paragraph 3). Protect the remachined surfaces on the axle pot by the application of ALODINE 1200.

(4) Cool the bushes (94) in liquid nitrogen and then fit them, with their flanges correctly seated.

(5) Hold the assembly in position until it returns to ambient temperature.

(6) Rework the faces of the bush flanges to obtain the dimension G (figure 406).

(7) Rework the inner ends of bushes (94) until they are flush with the $59 \begin{smallmatrix} +0,3 \\ +0 \end{smallmatrix}$ mm ($2.323 \begin{smallmatrix} +0.012 \\ +0 \end{smallmatrix}$ in) dia. clearance hole in the sliding rod, in accordance with the instructions given on figure 406.

(8) Rebore the bushes in line in accordance with the instructions given on figure 406.

(9) Machine the entry chamfers and carefully deburr the edges of the inner ends in accordance with the instructions given on figure 406.

(10) Protect the remachined surfaces of the bushes by the application of Cd6 cadmium-plating.

(11) Hone and polish the dia. B bore of the sliding rod in accordance with the instructions given on figure 405 to a diameter of 58 $^{+\ 0,044}_{+\ 0}$ mm (2.283 $^{+\ 0.0017}_{+\ 0}$ in), with a surface finish of 0,4 microns (minimum useful length 383 mm (15.08 in).

L. Fitment of axle (95) in axle pot (92) (figures 406, 409 and 1103)

NOTE : Before assembly, protect the axle pot by the application of ALODINE 1200 and paint, as indicated in paragraph C.(2) of the section "Protective treatment".

(1) Heat the axle pot to a temperature of 100°C (212°F).

(2) Cool the axle in liquid nitrogen and then insert it into the axle pot.

(3) Make sure that the dia. C (axle) and dia. E (axle pot) holes are in perfect alignment, using pin 63414. Hold the assembly in position until it returns to ambient temperature.

NOTE : If the above requirement cannot be met (or if damage to these holes has been discovered during CHECKS), rebore the holes in line to allow a repair size pin (117) to be fitted (see table of repair dimensions in paragraph 3). Protect the remachined surfaces on the axle pot by the application of ALODINE 1200.

3. Table of repair dimensions (in mm)

	FIG. No AND INDEX No	DESIGNATION	R1	R2	R3	R4	R5	TOLERANCES	NOTES
R	1101 (4)	Barrel	37,2	54,2	54,3	37,8		+ 0,019 + 0,000	dia. A bore "fig. 401"
R	A-B C-D E-F	Barrel	26,2	26,4	26,6	26,8		+ 0,021 + 0,000	dia. B bore "fig. 401"
R		Barrel	89,3	89,6	89,9	90,2		+ 0,035 + 0,000	dia. C bore "fig. 401"
R		Barrel	82,2	82,4	82,6	82,8	83	+ 0,054 + 0,000	dia. D bore "fig. 401"
R		Barrel	75,3	75,6	75,9	76,2		+ 0,046 + 0,000	dia. E bore "fig. 401"
R		Barrel	12 MINI AND 12,3 MAX						dia. F bore "fig. 401"
R		Barrel	13 MINI AND 13,3 MAX						dia. H bore "fig. 402"
R		Barrel	70 MINI AND 70,9 MAX						dia. K bore "fig. 403"
R		Barrel	79 MINI AND 79,9 MAX						dia. El bore "fig. 403"
R		Barrel	33 MINI AND 33,6 MAX						dia. M bore "fig. 403"
R		Barrel	86,2 MAX						dia. Dl bore "fig. 404"
R	1103 (91)	Sliding rod	48,1	48,2	48,3	48,4	48,5	+ 0,039 + 0,000	dia. A bore "fig. 405"
R		Sliding rod	58,1	58,2	58,3	58,4	58,5	+ 0,046 + 0,000	dia. B bore "fig. 405"

	FIG. No AND INDEX No	DESIGNATION	R1	R2	R3	R4	R5	TOLERANCES	NOTES
R	1103 (91)	Sliding rod	See axle pot dias F & C						dia. F bore "fig. 405"
R	1103 (92)	Axle pot	26,2	26,4	26,6	26,8		+ 0,021 + 0,000	dias. A & B bores "fig. 406"
R		Axle pot	15,6	15,7	15,8	15,9	16,1	+ 0,018 + 0,000	dias. F & C bores "fig. 406" (Fitment of sliding rod in axle pot)
R		Axle pot		48,3 MAX				- 0,072 - 0,097	dia. D bore "fig. 406"
R		Axle pot	11,1	11,2	11,3	11,4		+ 0,027 + 0,000	dias. C & E bores "fig. 406"
R		Axle pot	12,2	12,4	12,6	12,8		+ 0,027 + 0,000	dia. G bore "fig. 406"
R		Axle pot	67 + 0,030 + 0 MAX						dia. F bore "fig. 407"
R	1101 (12)	Torque arms	25,2	25,4	25,6	25,8		+ 0,021 + 0,000	dia. A bore "fig. 408"
R	1103 (103)	Torque arms	25,2	25,4	25,6	25,8		+ 0,021 + 0,000	dia. A bore "fig. 408"
R	1103 (95)	Axle	See axle pot dia. D See axle pot dia. C & E					- 0,025 - 0,050	Diameter A "fig. 409" dia. C bore

4. Protective treatment

A. Steel parts

(a) Locally restore the cadmium-plating on the parts listed below by the swab application of DALIC 408-4 cadmium solution, obtainable from Laboratoires DALIC, 29 rue Dareau - 75014 - PARIS - FRANCE.

- Column (138 A-B-C-D) (fig. 1104), except the inside, the chromium-plated surfaces, and the surfaces marked ℄ (see fig. 410).

- Guide (139) (fig. 1104), end pieces (205) (fig. 1105), except the surfaces marked ℄ (see fig. 411).

- Bushes (94) (fig. 1103), after fitment and remachining (see fig. 406).

- Washers (27) and (36) (fig. 1101), (54) (fig. 1102), cups (141) and (155) (fig. 1104), pins (35) (fig. 1102), (42) (fig. 1102), (117) (fig. 1103), nuts (55) (fig. 1102), (156) (fig. 1104), screws (212) (fig. 1105) and shims (220) (fig. 1105).

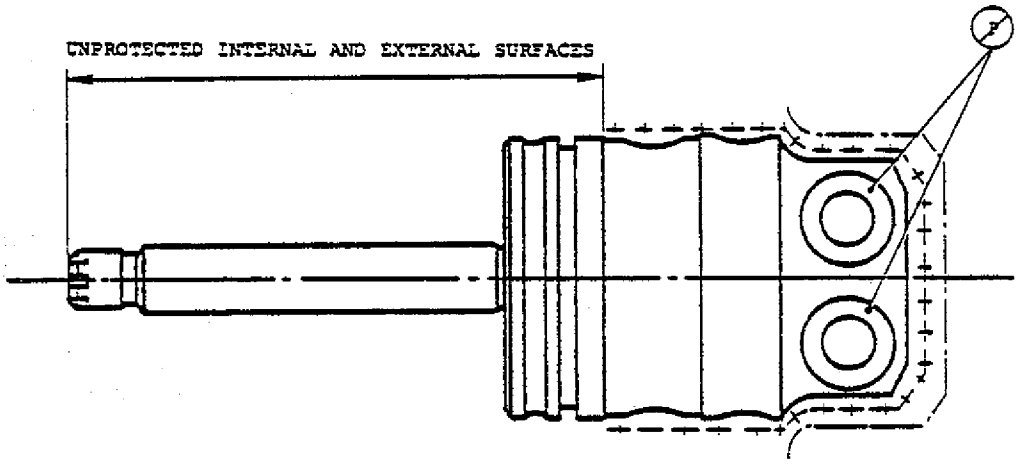
(b) Restore the fine phosphation treatment on the parts listed below :

NOTE : If the deposit is only slightly deteriorated restore it locally with JENOLITE RRN1.

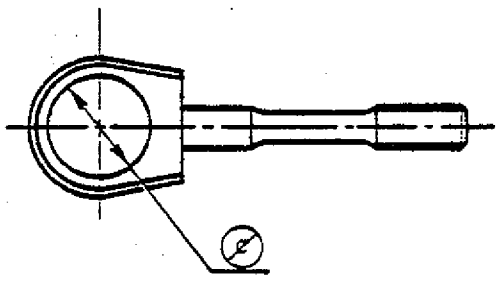
- Axle (95) (fig. 1103), after chromium-plating, over the complete surface, including the holes.

- Bottom base (164) (fig. 1104), on the surfaces marked + + + + + +, except in the threaded holes and on the counterbores marked (7) (see fig. 411)

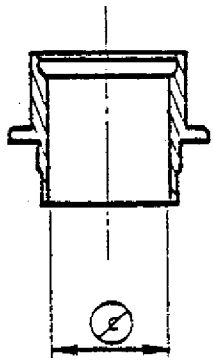
- Base (26) (fig. 1101), over the complete surface.



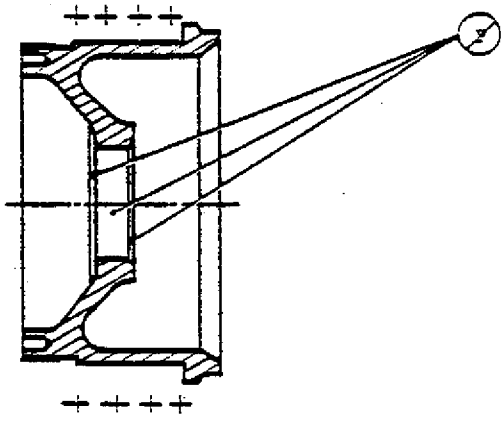
BOTTOM (164)



END PIECE (205)



GUIDE (139)



BASE (26)

Protective treatment

Figure 411

(c) Protect the parts listed below by chemical burnishing :

<u>NOTE</u> : If the deposit is only slightly deteriorated restore it locally with JENCLITE RRN1.

- Pins (10) (fig. 1101) and (101) (fig. 1103), over the complete surface.

- Washers (14) (fig. 1101), (105) (fig. 1103), pin (51) (fig. 1102) and ring (142) (fig. 1104), over the complete surface.

B. Light alloy parts

(a) Restore the dichromate treatment on the magnesium parts listed below :

- Barrels (4 A-B-C-D) (fig. 1101), after remachining and before insertion of parts.

- Cage (31) (fig. 1101), after remachining.

(b) Restore the protective treatment on the aluminium alloy parts listed below by the application of ALODINE 1200, obtainable from C.F.P.I., 28 Bld Camelinat - 92233 - GENNEVILLIERS - FRANCE.

- Barrels (4 E-F) (fig. 1101), after remachining and before insertion of parts.

- Axle pot (92) (fig. 1103), after remachining and before insertion of parts.

- Torque arms (12) and (103) (fig. 1101 and 1103), after remachining and before insertion of the bushings/bushes.

- Nut (28), bushing (33) (fig. 1101), cage (39 A-B-C-D) (fig. 1102), base (47) (fig. 1102), bush (93), spacer (198) and plugs (224) (fig. 1105).

- Socket assemblies (218) (fig. 1105), after riveting and reworking of the external diameter.

- Washer (83) (fig. 1102), after remachining.

- Matched rod (90) (fig. 1103), after remachining of the axle pot, and before insertion of bushes (94) and fitment of pin (117).

C. Painting

(1) Apply the Epoxy 200°C (392°F) paint scheme, obtainable from Ets ASTRAL, 11-13 Av; du President Salvador Allende - 94400 - VITRY - FRANCE, to the following parts :

- Barrel (4 A-B-C-D) (fig. 1101) (see figures 412 and 413).

- Before insertion of the bushes (except those mentioned in paragraphs A.(5), (6), (7), (8) and (9) of the section "Repair"), apply a coat of postprimer of the paint scheme over the whole barrel, except in the threaded holes for the three bonding bolts (68) and (75) (fig. 1102).

- After insertion of the parts, apply the rest of the paint scheme, except to the surfaces marked (F), in the threaded holes for the three bonding bolts (68) and (75) (fig. 1102) and in their 17 mm (0.67 in) dia. counterbores.

- Cage (31) (fig. 1101). Apply a coat of post-primer of the paint scheme only to the whole part.

(2) Apply the series 4080 anti-ester paint scheme, obtainable from Etablissements CELOMER, 75 Bld Winston Churchill - 76600 - LE HAVRE - FRANCE, to the following parts :

- Barrel (4 E-F) (fig. 1101) (see figures 412 and 413).

(a) After insertion of the bushes, apply a coat of primer of the paint scheme over the whole barrel, except in the threaded holes for the bonding bolts (68) and (75) (fig. 1102), their 17 mm (0.67 in) dia. counterbores, the bores of the fitted bushes and their flanges.

NOTE : Refer to paragraphs B.(5), (6), (7), (8) and (9) of the section "Repair" for the painting of bushes fitted for the restoration of bores.

(b) Apply the rest of the paint scheme, except in the places previously mentioned in (a) and those marked (P).

- Axle pot (92) (fig. 1103) (see figure 406)

1 Before insertion of the parts, apply a coat of primer of the paint scheme to the whole axle pot, including the bores in which the parts are to be inserted. Mask off the M6 x 100 threaded holes.

2 After insertion of the parts, apply the rest of the paint scheme, except to the surfaces marked (P), all the threaded holes, the chromium-plated surfaces and the inside of the sliding rod.

3 Apply a coat of primer and of post-primer of the paint scheme inside the holes in the axle in which socket assemblies (218) (fig. 1105) are to be fitted.

- Torque arms (12) or (103) (fig. 1101 and 1103) (see fig. 408)

1 Before insertion of the bushes, apply a coat of primer of the paint scheme to the whole torque arm, including the bores and the bearing surfaces for the bushes. Mask off the threaded hole, the 6 mm (0.236 in) and 10 mm (0.394) dia. holes for the pinning tool, and the 12 mm (0.472 in) dia. counterbores for bonding.

2 After insertion of the bushes, apply the rest of the paint scheme, except to the surfaces marked (P).

- Bottom base (164) (fig. 1104) (see fig. 411)

  - Apply the paint scheme to the surfaces marked ---- only, except in the threaded holes for screws (201) (fig. 1105), the seats for the two inflation valves and their 24 mm (0.945 in) dia. counterbore marked (P/).

  - Base (26) (fig. 1101) (see fig. 411)

1 Apply a coat of primer to the whole part.

2 Apply the rest of the paint scheme, except to the threads and the surfaces marked (P/) and ++++.

3 Apply a film of molybdenum disulphide to the surfaces marked (P/).

- Pins (10) (fig. 1101) and (101) (fig. 1103) (see figure 408)

  - Apply a coat of primer only of the paint scheme to the ends marked ++++++.

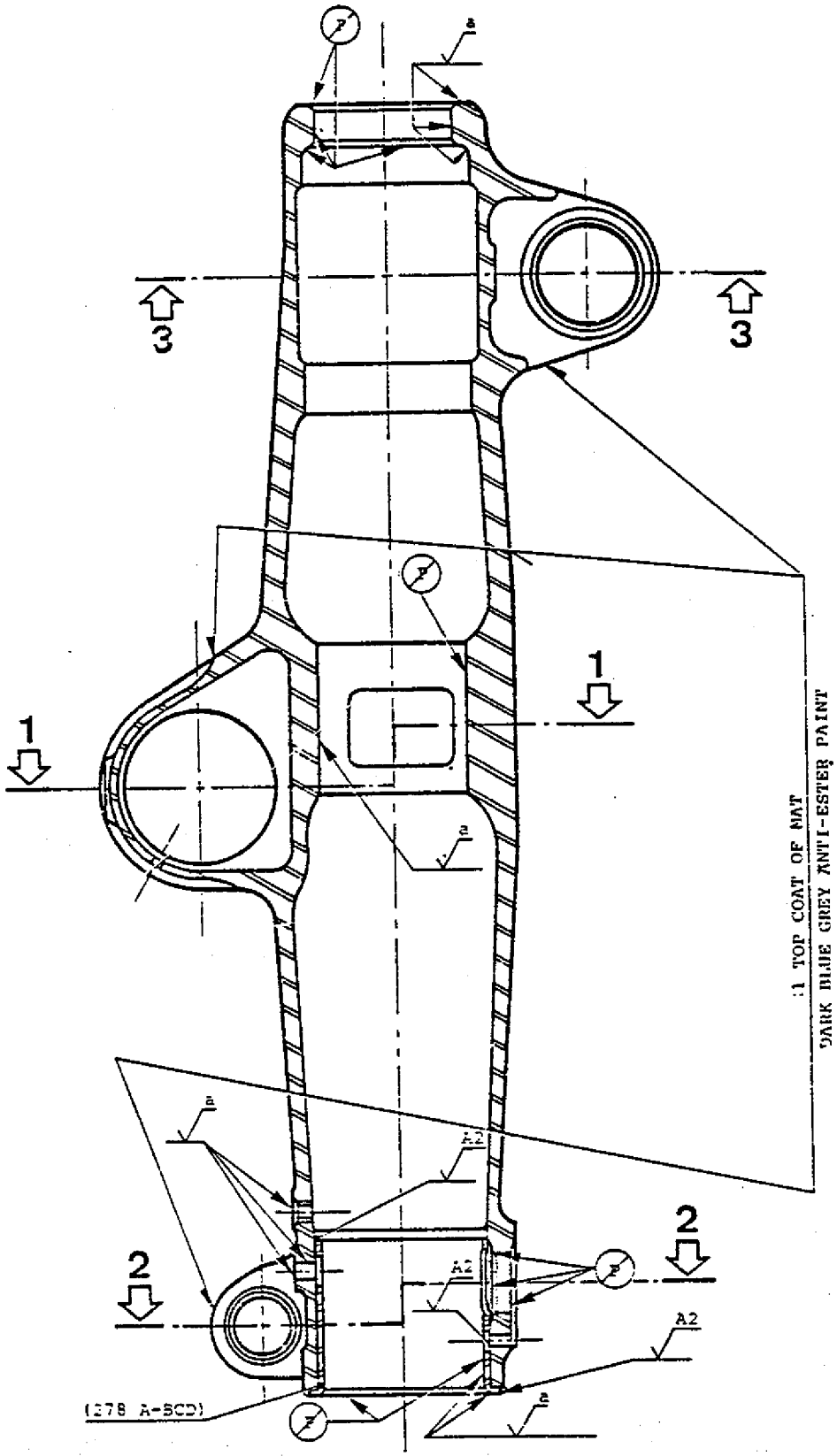
D. Supplementary anti-corrosive protective treatment (see figures 412 and 413)

- Bushed barrels (268 C-D-E-F) (fig. 1101)

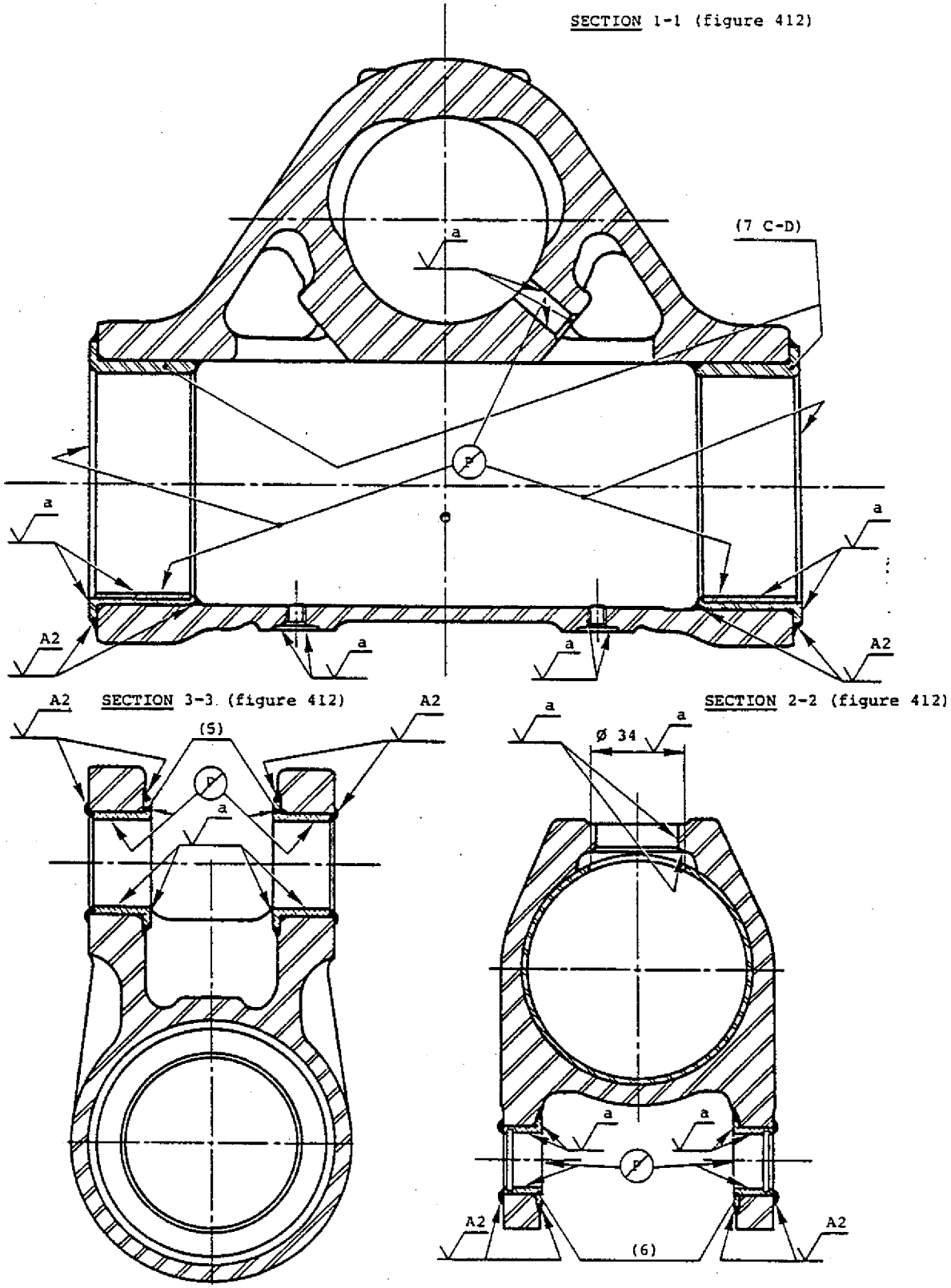
R

- Coat the jointing lines marked A2 with PR 1422 A2 liquid rubber sealant, obtainable from LE JOINT FRANCAIS

- Apply externally only, except to the surfaces marked a, one coat of finish of the series 4080 CELOMER anti-ester paint scheme (colour : dark matt blue-grey).



Protecture treatment
Figure 412



Protecture treatment

Figure 413

REASSEMBLY

1. General instructions

CAUTION : TAKE CARE WHEN HANDLING PISTONS (131), (143) AND (167), WHOSE EXTERNAL DIAMETERS ARE COATED WITH RILSAN PLASTIC. THIS MATERIAL IS VERY SUSCEPTIBLE TO IMPACT DAMAGE AND SCORING (see figure 1104).

A. Standard procedures

The MANUAL 32-09-01 contains all the processes concerning assembly.

The processes applicable to this section are :

- Rubberised sealing compound application : Section 24.

- Sealing compound for joints (ARALDITE) : Section 27.

B. Preparation of the parts

(1) The parts must be thoroughly clean and free from any temporary anti-corrosive protective grease, which might have been applied during repairs.

(2) Coat parts involved in assemblies or pivots with AIR 4215 B (MIL-G-7711A) grease;

(3) Coat the following with MASTINOX 6856K, obtainable from Ets CELOMER, 75 Bld Winston Churchill - 76600 - LE HAVRE (or similar product).

- The threads on threaded bushing (150), nuts (158), (156) and (55), the two screws (194), and on all the grease nipples (fig. 1102, 1104 and 1105).

- Pins (35), (42), (117) and (183), pin (192), cage (31), base (26), base (47) (fig. 1101, 1102, 1103, 1104 and 1105).

- The bearing surfaces for washers (36) and (27) (fig. 1101).

(4) Apply a conductive compound of the following composition :

- 58% by weight of MASTINOX 6856K
- 42% by weight of powdered zinc

. to the threads of bolts (68), (75) and (97) and screws (80), (273) and (234) (figures 1102, 1103 and 1105).

. to the bearing surfaces for washers (69), (76), (81), (98), (216) and (235) (figures 1102, 1103 and 1105).

(5) Lightly smear AIR 3520 (MIL-H-5606) hydraulic fluid on the walls of parts where stationary or sliding seals or packings are located.

(6) Fit the sealing rings to those parts requiring them as the assembly operation proceeds, taking care to stretch them as little as possible, and to locate them against the side of the groove which is opposite to the direction in which the part will be inserted. Use :

- Spatulas 89901 and A46524 (use only the latter for seals which are fitted to rilsan-coated parts).

NOTE : It is essential that the contact surfaces of two seals fitted in a groove one above the other be absolutely dry.

2. Assembly of basic components

A. Assembly of basic components of complete rod (88) (figures 1103, 1104 and 1105)

(1) Assemble restrictor (120)

(a) Insert in the restrictor in succession :

- orifice plug (121)
- spring (122)
- matched spool (123) (cylinder (124) and spool (125) , positioned so that screw (126) can be introduced.

(b) Fit and tighten screw (126), complete with its lock washer (127). Lock screw (126).

(2) Assemble piston (131)

(a) Insert socket (132) into piston (131) and push it fully home. Screw spring (133) inside.

(b) Fit cup (134) over the end of spring (133), then screw valve (135) on to the spring.

(3) Assembly of bottom base (164)

(a) Assemble piston (167)

- Grip the piston in the vertical position in a vice, using soft jaws 63693.

- Fit into the piston in succession :

  . washer (168),

  . packing holder (169), complete with its gaskets (170), (171) and (172),

  . washer (173)

- Fit and tighten threaded bush (174) with a torque loading of 10 Nm (7.375 lbf.ft), using wrench C47439.

- If necessary, drill a 1,8 mm (0,070 in) dia. hole in threaded bush (174), in line with one of the notches provided in piston (167) for locking purposes. Deburr, making sure that all swarf is removed.

- Insert split pin (175), then carefully cut the ends and bend them back on the internal diameter of threaded bush (174).

(b) Assemble bottom base (164)

- Grip the bottom base in the vertical position in a vice, using soft jaws C46827.

- Fit and tighten level tube (165), complete with its gasket (166).

- Fit piston (167) assembly on to the stem of the bottom base and push it fully home. Fit level tube (176), complete with its gasket (177), on to the stem of the bottom base also.

- Fit lock washer (179) in position.

- Screw on nut (178) and tighten it with a torque loading of 15 to 35 Nm (11.063 to 25.814 lbf. ft), using wrench 61800.

(4) Assemble column (138)

- Grip column (138) in a vice, using soft jaws C47604.

- Fit into the column in succession :

  . guide (139),

  . spring (140),

  . cup (141),

  . piston (143), complete with ring (142) and gaskets (144), (145) and (146),

  . washer (147), seated against the piston.

- Screw on nut (148) and tighten it with a torque loading of 20 Nm (14,750 lbf.ft), using wrench C47602

- If necessary, drill a 2,5 mm (0.098 in) dia. hole in column (138), in line with one of the notches provided in nut (148) for locking purposes. Deburr carefully, making sure that all swarf is removed.

- Insert split pin (149), then carefully cut the ends and bend them back on the internal diameter of the column.

(5) Assemble cover (197)

(a) Fit to cover (197) in succession :

- spacer (198),

- spring (199),

- box (200).

(b) Insert screws (201), then fit and tighten nuts (202).

(6) Assemble sockets (219)

(a) Insert blank (226), complete with its preformed packing (227), into socket (219), then fit pin (228).

(b) Screw on and tighten plug (224), complete with its preformed packing (225).

(7) Assemble lower torque arm (103)

(a) Screw ball (240) into the torque arm, positioning it so that it protrudes by the same amount either side.

(b) Engage washer (114) in a notch on the ball, then insert screw (113) as indicated on the figure.

Screw on nut (116), complete with washer (115), and tighten it.

- Lock with stainless steel wire and apply a "repair" seal.

(c) Temporarily screw nut (248), together with washer (247), on to screw (113).

(8) Assemble pin (101)

- Insert grease distributor (106), complete with preformed packings (107) and (108), and line up the holes for pin (109).

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B. Assembly of basic components of the barrel (figures 1101 and 1102)

(1) Assembly of torque arm (12)

(a) Screw half cage (241) into the torque arm.

(b) Engage washer (23) in a notch on the half cage, then insert bolt (22) as indicated on the figure. Place washer (24) in position, then screw on and tighten nut (25).

(c) Temporarily screw nut (74), together with washer (73), on to bolt (22).

(2) Assemble pin (10)

- Insert grease distributor (15), complete with pre-formed packagings (16) and (17), and line up the holes for pin (18).

(3) Assemble ball (40)

NOTE : For the matching of cage (39) and ball (40), refer to paragraph H in the section "REPAIR".

- Position scraper ring (41) in its housing.

(4) Assemble base (47)

(a) Fit roller carrier (48) on to base (47), then insert pin (52) into the base and the roller carrier, and fit stop rings (53) in position.

(b) Fit roller (49) and insert pin (50).

(c) Swing the roller carrier assembly inside the base insert pin (51), and swage each end with a punch.

(5) Assemble guide (32)

(a) Coat guide (32) with a film of AIR 4215B (MIL-G-711A) grease.

(b) Fit the guide into cage (31), followed by bushing (33). Make sure that the holes in the bushing and the cage for screws (34) are lined up.

(c) Degrease the screws with a chlorinated solvent, then fit them and tighten them.

(d) Coat the heads of the screws with glycerophtalic varnish, reference 0871, obtainable from Ets CELOMER, 75 Boulevard Winston Churchill - 76600 - LE HAVRE (or similar product).

3. Assembly of main components

A. Assembly of the sliding rod (figures 1103, 1104 and 1105)

(1) Grip sliding rod (91) in a vice, using soft jaws C46797.

(2) Fit restrictor (120) assembly.

(a) Insert restrictor (120) assembly into the top of the sliding rod and hold it there with wrench 61795.

(b) Fit screw (129) into nut (128) and screw it up lightly.

(c) Insert nut (128) through the bottom of the sliding rod using wrench C47456. Tighten the nut on to restrictor (120) assembly to a torque loading of 70 Nm (51.620 lbf.ft).

(d) Tighten screw (129) with screwdriver C46093.

(3) Insert piston assembly (130) through the bottom of the sliding rod until valve (135) makes contact with restrictor (120), using extractor C47605.

(4) Fit bottom base assembly (163)

(a) Insert the bottom base assembly and position it so that the inflation valve holes are directed towards the torque arm.

(b) Align the holes in the bottom base and the axle pot, then insert pin (183), so that its centre hole lies on the longitudinal axis of the sliding rod. See figure 1104 for the position of the shoulder on the pin.

(c) Fit bush (184) and the two washers (185) at each end of the pin, and lock with split pins (186).

(d) Thread stainless steel wire (187) through the bush and the pin, twist it together, and apply a "repair" seal.

(e) Insert pin (192) into the bottom base, then fit in succession :

- plate (193),

- screws (194), tightening them and locking them with stainless steel wire (195).

(5) Fit column (138) assembly

(a) Insert column (138) assembly into the top of the sliding rod.

(b) Screw threaded bushing (150) into sliding rod (91) and tighten it with a torque loading of 20 Nm (14.750 lbf.ft), using wrench C46831.

(c) Fit stop ring (151) in position.

(6) Bond plates (152) and (153) in position with ARALDITE (plate (154) also, only if a replacement complete rod (88) has been fitted).

(7) Fit bolt (97) and screw (234), for bonding.

NOTE : Coat the contact faces of washers (98) and (235) and the threads of bolt (97) and screw (234) with conductive compound.
Refer to paragraph 1.B (Preparation of the parts)

(10) Fit socket assemblies (218)

- Insert a socket assembly into each end of the axle, fit lock washers (274) and secure the former by means of screws (275).

(a) Fit washers (98) and (235) in position, then fit bolt (97) and screw (234) and tighten them to a torque loading of 3 Nm (2.212 lbf.ft).
After tightening, apply a bead of ARALDITE in the counterbores for the washers.

(b) Temporarily screw nut (100), complete with washer (99), on to bolt (97).

(8) Fit end pieces (205)

NOTE : Before fitting the end pieces, apply a bead of rubber compound to the jointing lines between the flanges of bushes (93) and the axle pot. Apply it as instructed in paragraph D of the section "Final steps".

(a) Place the end pieces in position between the lugs opposite the inflation valve holes. Align the holes and insert pin (204).

(b) Fit end pieces (206) over the ends of the pin and lock with split pins (207).

NOTE : Choose the appropriate holes in end pieces (206) to ensure that they are correctly seated on the ends of the pin, while allowing the split pins to be fitted properly, without straining.

(c) Temporarily fit shims (208) and washers (209) to end pieces (205), and screw on nuts (210).

NOTE : The thickness of shims (208) must be adjusted to obtain the correct mounting for the locking device.

(9) Temporarily fit screws (212), together with their washers (211).

(10) Fit socket assemblies (218)

- Insert a socket assembly into each end of the axle and secure them with screws (229).

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(11) Fit pin (117)

(a) Fit pin (117) securing the axle-axle pot assembly, and position its tapped hole so that it is accessible.

(b) Screw on and tighten nut (119), complete with washer (118).

(c) Temporarily fit screw (233).

(12) Fit torque arm (103) assembly

NOTE : Before fitting the torque arm assembly, apply a bead of rubber compound to the jointing lines between bushes (93) and the axle pot. Apply it as instructed in paragraph D of the section "Final steps".

(a) Adjust the thickness of washers (105) so that, after assembly, the torque arm has a clearance between the lugs of 0,02 to 0,10 mm (0.00078 to 0.00394 in).

(b) Position the torque arm assembly correctly between the lugs, with washers (105) inserted, and fit matched pin (101).

Align the holes for lubrication pin (109), then insert it, and fit washer (110) and split pin (111)

(c) Screw in and tighten grease nipple (112).

(13) Screw in the two inflation valves (188), complete with their preformed packings (189), and tighten them with a torque loading of 10 to 12,5 Nm (7.375 to 9.220 lbf. ft). Lock the valves with stainless steel locking wire and apply a "repair" seal.

B. Assembly of the barrel (figures 1101 and 1102)

(1) Fit base (26)

(a) Insert base (26) into the barrel and push it fully home.

(b) Fit washer (27) at the top of the barrel, then screw on nut (28) and tighten it with a torque loading of 50 Nm (36.875 lbf.ft), using wrenches C46830 and C47606.

(c) If necessary, drill a $3,5 \begin{smallmatrix} + 0,18 \\ + 0 \end{smallmatrix}$ mm (0.138 $\begin{smallmatrix} + 0.0071 \\ + 0 \end{smallmatrix}$ in) dia. hole in line with one of the holes in nut (28), provided for locking purposes. Deburr carefully and make sure that all swarf is removed.

(d) Insert split pin (29), cut off its ends and bend them back against the internal diameter of the base.

(2) Fit guide assembly (30)

(a) Insert the guide assembly and position it in the barrel.

Align the hole in it for pin (35) with the one in the barrel.

(b) Insert the pin from the inside, hold it in place with wrench 61788, then fit washer (36) and screw on and tighten nut (37).

NOTE : Cover nut (37) and washer (36) protruding into the barrel with liquid rubber sealant. Apply it as instructed in paragraph D of the section "Final steps".

(3) Fit ball joint bearing assembly (38)

(a) Introduce the ball joint bearing assembly into the barrel and position it so that the hole for pin (42) is situated above torque arm (12).

(b) Fit pin (42) in position from the inside, and hold it there with a 5 mm (0.197 in) ALLEN key.

(c) Fit washer (43), screw on nut (44) and tighten it with a torque loading of 20 Nm (14.750 lbf.ft).

(d) Screw grease nipple (45) into the pin and tighten it.

(e) Apply a bead of rubber compound to the upper jointing line between the ball cage and the barrel. Apply it as instructed in paragraph D of the section "Final steps".

(4) Fit base assembly (46)

(a) Introduce the base assembly into the barrel, with roller (49) at the top, and the holes for the switch attachment screws in a plane at right-angles to the centre-line of the leg, within a tolerance of $\pm$ 2°.

(b) Fit washer (54), screw on nut (55) and tighten it with a torque loading of $20 \begin{smallmatrix} +10 \\ +0 \end{smallmatrix}$ Nm ($14.750 \begin{smallmatrix} +7.37 \\ +0 \end{smallmatrix}$ lbf.ft), using wrench C46535.

(c) Fit stop ring (56).

NOTE : Retightening of nut (55) may cause the locking holes to move out of line. In this case, a hole must be drilled outside the plane of the attachment holes for switch (57). The depth of the hole must not exceed 7 mm (0.275 in), measured from the bottom of the notch in nut (55).

(5) Fit washers (69) and (76), screw in bolts (68) and (75) and tighten them with a torque loading of 3 Nm (2.212 lbf.ft). After tightening, apply a bead of ARALDITE in the counterbores for the washers. Temporarily screw nuts (71) and (79), complete with washers (70) and (78), on to bolts (68) and (75).

NOTE : Coat the contact faces of washers (69) and (76) and the threads of bolts (68) and (75) with conductive compound. Refer to paragraph 1.B (Preparation of the parts).

Plug the threaded holes for bolts (68) and (75), where they enter the barrel, with rubber compound.

Apply it as instructed in paragraph D of the section "Final steps".

(6) Fit torque arm (12) assembly

NOTE : Before fitting the torque arm, apply a bead of rubber compound to the jointing lines between bushings (6) and the barrel, as instructed in paragraph D of the section "Final steps".

(a) Adjust the thickness of washers (14) so that, after assembly, the torque arm has a clearance between the lugs of 0,02 to 0,10 mm (0.00078 to 0.00394 in)

(b) Position the torque arm assembly correctly between the lugs and insert matched pin (10). Align the holes for lubrication pin (18), then insert it, and fit washer (19) and split pin (20) as well.

(c) Screw in and tighten grease nipple (21).

(7) Fit washer (83) in place as shown on figure 1102. See CAUTION in para. 2.A.(3) of the section "REPAIR".

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4. Fitting together of main components

Fitting together of the complete rod assembly and the barrel (figures 1101, 1103, 1104 and 1105).

(1) Introduce the complete rod assembly into the barrel and push it fully home. Align the torque arms.

CAUTION : TAKE CARE DURING THE ABOVE OPERATION NOT TO DAMAGE GUIDE (32).

(2) Fit cup (155) in position at the top of the barrel, screw nut (156) on to column (138) and tighten it with a torque loading of 20 Nm (14.750 lbf.ft), using wrench PR47689. Lock with split pin (157).

(3) Screw in plug (158) finger-tight, complete with its gaskets (159) and (160).

(4) Join the torque arms together

(a) Slide half cage (239) on to pin (237), with the hemispherical part of the former towards the threads on the latter.

(b) Join the two torque arms together and insert pin (237) such that half cage (239) is in contact with ball (240) on the lower torque arm.

(c) Fit lock sleeve (242) in place, screw on nut (243) and tighten it enough to obtain a swivelling torque of 3 to 5 Nm (2.212 to 3.688 lbf.ft).

(d) Lock nut (243) by means of screw (244) and nut (245), with a torque loading of 6 to 7 Nm (4.425 to 5.160 lbf.ft).

(e) Screw in and tighten grease nipple (246).

(e) Fit washer (276) and lock with split pin (277).

(f) Screw in and tighten grease nipple (246).

5. Refitment of attached components

A. Fitment of switch (57) (figure 1102)

NOTE : The switch must be overhauled and tested.

(1) Before fitting the switch, retract the sliding rod approximately 50 mm (1.968 in) from the leg extended position and check :

- the distance between the mounting face for the switch on base (47) and the upper face of roller carrier (48), in the raised position, which should be 13,3 ± 0,3 mm (0.524 ± 0.118 in).

(2) Check that the dimension "L" does not exceed 13 mm (0.512 in). Slacken screw 3 if necessary. See figure 703 in the section TESTING.

(3) After the above check, push switch (57) fully into the base, with its connector upwards.

(4) Secure the switch by means of bolts (61). One of the bolts should be assembled with bonding strip (59) and washer (58), the other with washers (58) and (60). (See figure 1102).

(5) Lock the bolts together with stainless steel wire (62) and apply a "repair" seal.

The bolts are to be locked after completion of testing of the leg and the switch.

NOTE : Protective cover assembly (63) is to be fitted after the application of rubber compound as described in paragraph D.(3) of the section "Final steps".

B. Fitment of bonding strips (figures 1101, 1102, 1103 and 1105)

(1) Connect bonding strip (59), from the switch, to bolt (75), fitted to the barrel (diametrically opposite). At the same time, connect to the latter one end of bonding strip (77), while connecting the other end to the upper torque arm, by means of screw (80), washers (81) and nut (82).

(2) Provide an earth connection between the torque arms by means of bonding strip (72), fixed to bolt (22) and screw (113).

(3) Fix one end of bonding strip (214) to bolt (97), then connect the other to the lower torque arm by means of screw (215), washers (216) and nut (217).

NOTE : Coat the contact faces of washers (81) and (216) and the threads of screws (80) and (215) with conductive compound.
Refer to paragraph 1.B (Preparation of the parts)

C. Fitment of static discharger assembly (230) (figure 1105)

- Fit the static discharger assembly inside pin (117) and secure it with screw (233).

(1) Connect bonding strip (59), from the switch, to bolt (75), fitted to the barrel (diametrically opposite). At the same time, connect to the latter one end of bonding strip (77), while connecting the other end to the upper torque arm, by means of screw (271), lock washer (270), washers (81) and nut (82).

(3) Fix one end of bonding strip (214) to bolt (97), then connect the other to the lower torque arm by means of screw (273), lock washer (272), washers (216) and nut (217).

NOTE : Coat the contact faces of washers (81) and (216) and the threads of screws (80) and (217) with conductive compound.
Refer to paragraph 1.B (Preparation of the parts)

D. Fitment of hose assembly (249) (figures 1102 and 1105)

NOTE : The hose assembly must be checked and tested.

Position the hose assembly as shown on figure 1105, then fix it in place by means of mounts (84) and (85), held by clamps (86) and (269), with adhesive tape (87) interposed between the clamps and the barrel.

E. Fitment of electrical cable (253) (figure 1105)

NOTE : The electrical cable must be overhauled and tested.

(1) Plug the straight connector on electrical cable (253) into the switch.

(2) Position the electrical cable on mount (84) and secure it by means of clamp (254).

6. Final steps

A. Testing

(1) Test the undercarriage leg in accordance with the instructions given in the section "TESTING".

(2) Fit cover assembly (196) in position at the bottom of the shock absorber.

(3) Fit cap (161) over plug (158), situated at the top of the leg, and lock with stainless steel wire (162) (fig. 1104).

B. Fitment of plates (fig. 1105)

- Transfer to new plates (259), (260) and (264) all the information existing on the old ones.

- Before bonding plate (260) in position, stamp the indices of any new modifications embodied after the component Part Number.

- Before bonding plate (264) in position, stamp the index of the new amendment.

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- Mark the repair plate reference 10191 with the symbol authenticating the overhaul, together with the indices of any modifications embodied.

- Carefully roughen the contact surfaces of the plates with emery cloth, then clean them and the surfaces on the supporting part with an approved chlorinated solvent.

- Bond plates (203), (255), (256), (257), (259), (260), (261), (262), (263) and (264) in the positions shown on the figure, using ARALDITE. Leave a thin strip of adhesive around each plate, about 3 mm wide. This border will be covered with paint, so as to avoid any gap in the protective covering.

- Restore any paint as necessary, using the CELOMER series 4080 anti-ester paint scheme (colour : dark matt blue-grey)

Repair plate

- Slide the plate 10191 on to a LIGATEX 5 strap and install it in a prominent position. Apply a drop of solder to the folded over end of the strap.

C. General lubrication

- Inject approximately 3 cm3 (0.20 cu.in) of AIR 4215B (MIL-G-7711A) grease through all nipples. Remove any excess grease exuding from pivot points with a clean dry cloth.

D. Application of external protection

(1) (a) Apply standard red paint to all grease nipples, masking off the tip first of all.

(2) Seal off all exposed surfaces of assemblies (see figure 501).

(a) Make sure that all the surfaces to be protected are clean, degreasing locally with white spirit where necessary, avoiding any spattering or infiltration.

(b) At all the points marked on the figure, and following the instructions given below for each one, apply liquid rubber sealant PR 1422 A2 (in two parts), obtainable from LE JOINT FRANCAIS, 84-116 rue Salvador Allende - 95870 - BEZONS (or similar product).

- M1 Completely cover all parts securing the column to the upper part of the barrel, except the cover for the shock absorber filler plug. Apply a bead to the jointing line between these parts and the barrel.

- M2 Apply a bead to the jointing lines between the fitted bushings and the barrel (inside and outside the lugs).

- M3 Apply a bead to the jointing lines between the flanges of the fitted bushings and the barrel (inside and outside).

- M4 Cover the nuts and screws securing the bonding strips on the switch and the upper torque arm.

- M5 Cover the fixing nut for the pin and its jointing line with the barrel (mask off the end with the grease nipple).

- M6 Cover the fixing nut for the switch base and its jointing line with the barrel.

- M7 Cover the fixing screws for the switch and their jointing lines with the latter.

- M8 Apply a bead to the jointing line between the cage and the barrel.

- M9 At each end of the torque arm pivot pins, cover the jointing lines between the fitted bushings and the barrel and the axle pot.

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- M10 Cover the nut and screw securing the bonding strip to the lower torque arm.

  Cover the nut and screw securing the other end of the strip to the barrel.

- M11 Cover the heads of the screws and the nuts securing the bonding strip jointing the two torque arms.

- M12 Apply a bead to the jointing line between the sliding rod and the axle pot.

- M13 Apply a bead covering the joint between the fitted bushings and the axle pot. Extend the bead to the end of the pin and the end piece

- M14 Coat the nut and the head of the pin securing the axle pot to the axle.

- M15 Cover the ends of the pins fitted with grease nipples in the upper and lower torque arm pivots.

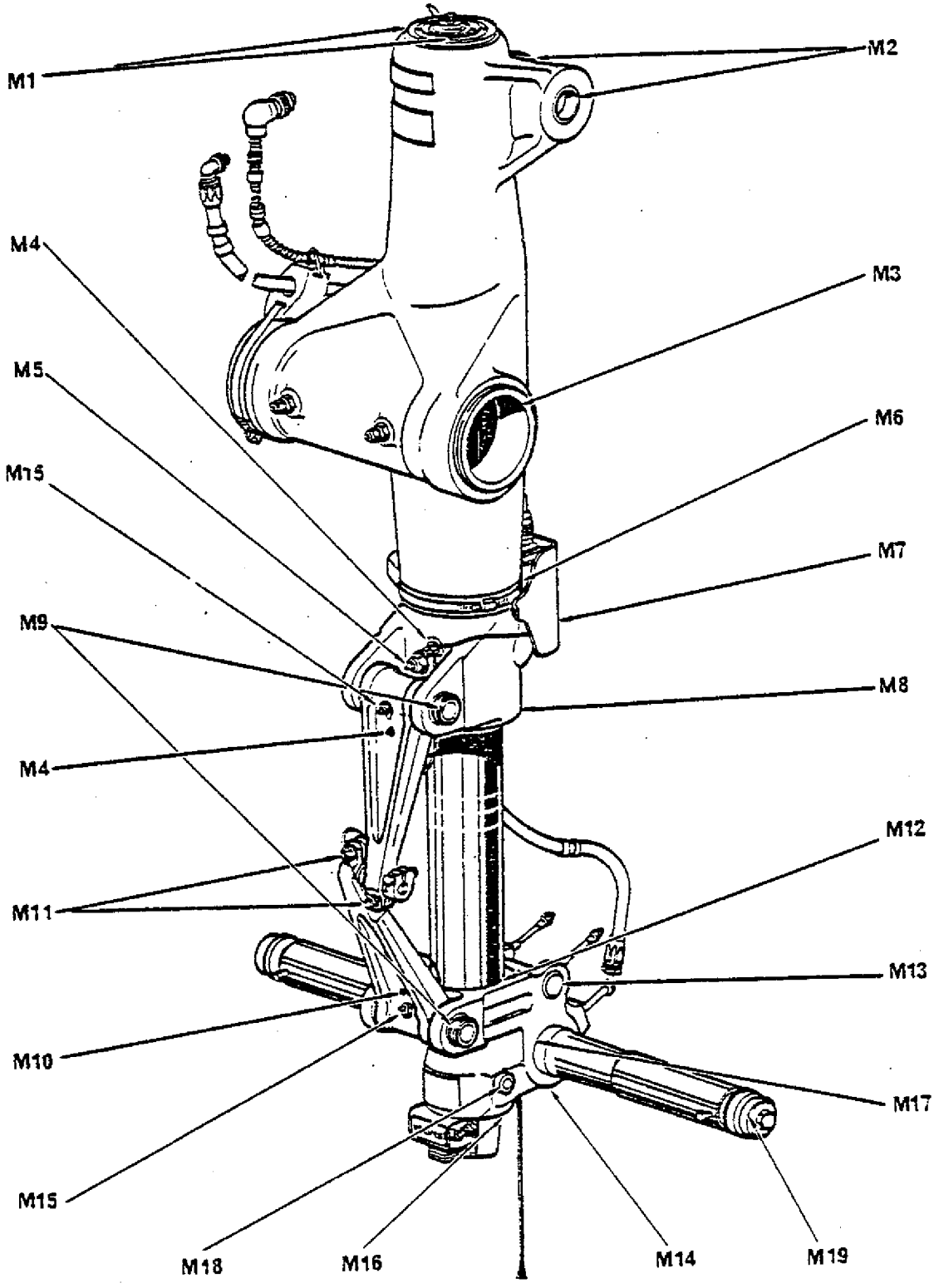
- M16 Cover the jointing line between the axle pot the sliding rod and the bottom base.

- M17 Apply a bead to the jointing line between the axle pot and the axle.

- M18 Cover the jointing lines between the bushings fitted in the axle pot and the ends of the pin.

- M19 Apply a bead to the joint between the socket assemblies and the axle.

(3) Secure protective cover assembly (63) to switch (57) by means of nuts (67), together with washers (66).



Application of rubber sealant

Figure 501

FITS AND CLEARANCES

1. Table of dimensions

A. Joints between undercarriage, structure, jack and strut

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1101 (4)	Barrel	Int.dia. 37,025 37,000	Interference fit 0,055	37,025	Interference fit 0,055	Interference fit must be retained
1101 (5)	Bushings	Ext.dia. 37,096 37,080	0,096	37,080		
1101 (5)	Bushings	Int.dia. 32,025 32,000		32,086		The internal dia. of bushings (5) mates with the strut jack link pin
		Ext.dia. See remarks				
1101 (4)	Barrel	Int.dia. 89,035 89,000	Interference fit 0,036	89,035	0,036	Interference fit must be retained
1101 (7A-B)	Bushing assemblies	Ext.dia. 89,106 89,071	0,106	89,071		
1101 (7A-B) 1101 (7C-D)	Bushing assemblies Bushings	Int.dia. 80,030 80,000		80,070		The internal dias.of bushing assemblies (7A-B) or of bushings (7C-D) mate with structural parts in the helicopter
		Ext.dia. See remarks				

1. Table of dimensions

B. Joints between barrel and sliding rod

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1101 (31)	Cage	Int.dia. 60,030 60,000	0,010	60,080	0,235	
1101 (32)	Guide	Ext.dia. 59,990 59,945	0,085	59,845		
1101 (32)	Guide	Int.dia. 54,590 54,495	0,025	54,780	0,435	
1103 (91)	Sliding rod	Ext.dia. 54,470 54,440	0,150	54,345		
1101 (4)	Barrel	Int.dia. 82,054 82,000	0,072	82,265	0,585	
1102 (39)	Cage	Ext.dia. 81,928 81,893	0,161	81,680		
1102 (39)	Cage	Int. sph.dia. 72,046 72,023	0,023	72,155	0,235	Matched assembly Ref. A
1102 (40)	Ball	Ext. sph.dia. 72,000 71,977	0,069	71,920		

1. Table of dimensions

B. Joints between barrel and sliding rod (continued)

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1102 (39)	Cage	Int. sph.dia. 72,023 72,000	0,023	72,135	0,235	Matched assembly Ref B
1102 (40)	Ball	Ext. sph.dia. 71,977 71,954	0,069	71,900		
1102 (40)	Ball,	Int.dia. 65,106 65,060	0,090	65,420	0,640	
1103 (91)	Sliding rod	Ext.dia. 64,970 64,940	0,166	64,780		
1102 (39)	Cage	Int.dia. 11,027	0,095	11,085		
1101 (4)	Barrel	11,000			0,265	
1102 (42)	Pin	Ext.dia. 10,905 10,878	0,149	10,820		

1. Table of dimensions

C. Joints between barrel and upper torque arm, and between axle pot and lower torque arm

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1101 (4) 1103 (93)	Barrel Axle pot	Int.dia. 26,021 26,000	Interference fit 0,043	26,021	Interference fit 0,043	Interference fit must be retained
1101 (6) 1103 (93)	Bushings Bushes	Ext.dia. 26,077 26,064	0,077	26,064		
1101 (6) 1103 (93)	Bushings Bushes	Int.dia. 21,013 21,000	Original matched clearance 0,009 to 0,022			Ext.dias.of pins machined to suit int. dias.of bushes for matched assembly
1101 (10) 1103 (101)	Pins	Ext.dia. See remarks			0,080	
1101 (12) 1103 (103)	Torque Arms	Int.dia. 25,021 25,000	Interference fit 0,043	25,021	Interference fit 0,043	Interference fit must be retained
1101 (13) 1103 (104)	Bushings Bushes	Ext.dia. 25,077 25,064	0,077	25,064		

1. Table of dimensions

C. Joints between barrel and upper torque arm, and between axle pot and lower torque arm

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1101 (13) 1103 (104)	Bushings Bushes	Int.dia 21,002 20,989	.Original matched clearance 0,000 to 0,009		0,025	Ext.dias.of pins machined to suit int. dias of bushes for matched assembly
1101 (10) 1103 (101)	Pins	Ext.dia see remarks				
Side clearance on torque arms			0,02 to 0,1		0,30	

1. Table of dimensions

D. Joints between sliding rod, axle pot and axle

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1103 (92)	Axle pot	Int.dia. 64,909 64,879	Interference fit 0,031	64,909	Interference 0,031	Interference fit must be retained
1103 (91)	Sliding rod	Ext.dia. 64,970 64,940	0,091	64,940		
1103 (92)	Axle pot	Int.dia. 46,928 46,903	Interference fit 0,022	46,928	Interference fit 0,002	Ext.dia. of axle machined to suit int. dia. of axle pot for match-assembly Interference fit must be retained
1103 (95)	Axle	Ext.dia. See remarks				
1103 (93)	Axle pot	Int.dia. 11,027	0,016	11,070	0,185	
1103 (95)	Axle	11,000				
1103 (117)	Pin	Ext.dia. 10,984 10,966	0,061	10,885		
1103 (91) 1103 (92)	Sliding rod Axle pot	Int.dia. 15,518 15,500	Interference fit 0,027	15,518	Interference fit 0,027	Interference fit must be retained
1103 (94)	Bushes	Ext.dia. 15,556 15,545	0,056	15,545		

1. Table of dimensions

F. Joint between axle pot and locking device

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART MIN AND MAX DIMENSIONS IN mm	NEW PART CLEARANCES IN mm	WORN PART MIN AND MAX DIMENSIONS IN mm	WORN PART CLEARANCES IN mm	NOTES
1103 (92)	Axle pot	Int.dia. 12,027 12,000	Interference fit 0,001	12,027	Interference fit 0,001	Interference fit must be retained
1103 (96)	Bushes	Ext.dia. 12,046 12,028	0,046	12,028		
1103 (96)	Bushes	Int.dia. 8,098 8,040	0,053	8,150	0,220	
1105 (212)	Screw	Ext.dia. 7,987 7,972	0,126	7,930		
1103 (93)	Bushes	Int.dia. 21,013 21,000		21,150	0,200	
1105 (204)	Pin	Ext.dia. 21,000 20,987	0,026	20,950		
1105 (205)	End pieces	Int.dia. 21,013 21,000		21,070	0,120	
1105 (204)	Pin	Ext.dia. 21,000 20,987	0,026	20,950		

FITS AND CLEARANCES

1. Table of dimensions

F. Shock absorber

FIGURE N° AND INDEX N°	DESIGNATION	NEW PART		WORN PART		NOTES
		MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	MIN AND MAX DIMENSIONS IN mm	CLEARANCES IN mm	
1103 (91)	Sliding rod	Int.dia. 58,046 58,000	0,030	58,055	0,120	
1104 (131) 1104 (167)	Piston Piston	Ext.dia. 57,970 57,940	0,106	57,935		Pistons rilsan-coated
1103 (91)	Sliding rod	Int.dia. 48,039 48,000	0,025	48,050	0,110	
1104 (143)	Piston	Ext.dia. 47,975 47,950	0,089	47,940		Pistons rilsan-coated
1104 (169)	Packing holders	Int.dia. 13,027 13,000	0,016	13,030	0,075	
1104 (164)	Bottom base	Ext.dia. 12,984 12,966	0,061	12,955		
1104 (124)	Cylinder		Original matched clearance 0,008 to 0,012		0,012	
1104 (125)	Spool					

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2. Table of torque loadings

FIGURE N° AND INDEX N°	DESIGNATION	TORQUE VALUE (Nm)	NOTES
1101 (28)	Nut	50 (36,875 lbf.ft)	
1102 (55)	Nut	20 $^{+\ 10}_{+\ 0}$ (14.750 to 22.13 lbf.ft)	
1102 (44)	Nut	20 (14.750 lbf.ft)	
1102 (68)	Bolt	3 (2.212 lbf.ft)	Bonding bolt
1102 (75)	Bolt	3 (2.212 lbf.ft)	Bonding bolt
1103 (97)	Bolt	3 (2.212 lbf.ft)	Bonding bolt
1105 (234)	Screw	3 (2.212 lbf.ft)	Bonding screw
1104 (128)	Nut	70 (51.620 lbf.ft)	
1104 (148)	Nut	20 (14.750 lbf.ft)	
1104 (150)	Threaded bushing	20 (14.750 lbf.ft)	
1104 (156)	Nut	20 (14,750 lbf.ft)	
1104 (174)	Threaded bush	10 (7.375 lbf.ft)	
1104 (178)	Nut	15 to 35 (11.063 to 25.814 lbf.ft)	
1105 (243)	Nut	Approximate tightening	To obtain a swivelling torque of 3 to 5 Nm (2.212 to 3.688 lbf.ft)

2. Table of torque loadings (continued)

FIGURE N° AND INDEX N°	DESIGNATION	TORQUE VALUE	NOTES
1105 (245)	Nut	6 to 7 (4.425 to 5.160 lbf.ft)	
1104 (158)	Plug	10 + 1 (6.637 to 8.112 lbf.ft)	
1105 (188)	Valve	10 to 12,5 (7.375 to 9.220 lbf.ft)	On the base of the valve
1105 (188)	Valve	5 to 8,75 (3.688 to 6.454 lbf.ft)	On the valve control nut

TESTING

1. Preparation

   A. Remove the inflation valve cores, and open their HP and LP orifices.

   B. Remove plug (158) (figure 1104) from port B and fit in its place connector SK 20413.

   C. Mount the undercarriage leg on a test panel type SK 30478, in the vertical position, with port B at the top.

      - Use the set of adaptors D21936-1001 and attachment fixture F21840.

   D. Prepare a hydraulic generation unit type SK 30476, filled with AIR 3520A (MIL-H-5606C Amd 1) hydraulic fluid, and a supply of compressed dry nitrogen.

2. Purging and distortion check (figure 701)

   A. Purging

      (1) Compress the shock absorber fully.

      (2) Apply a low pressure at B, to fill the shock absorber completely and to move the separator pistons to the bottom.

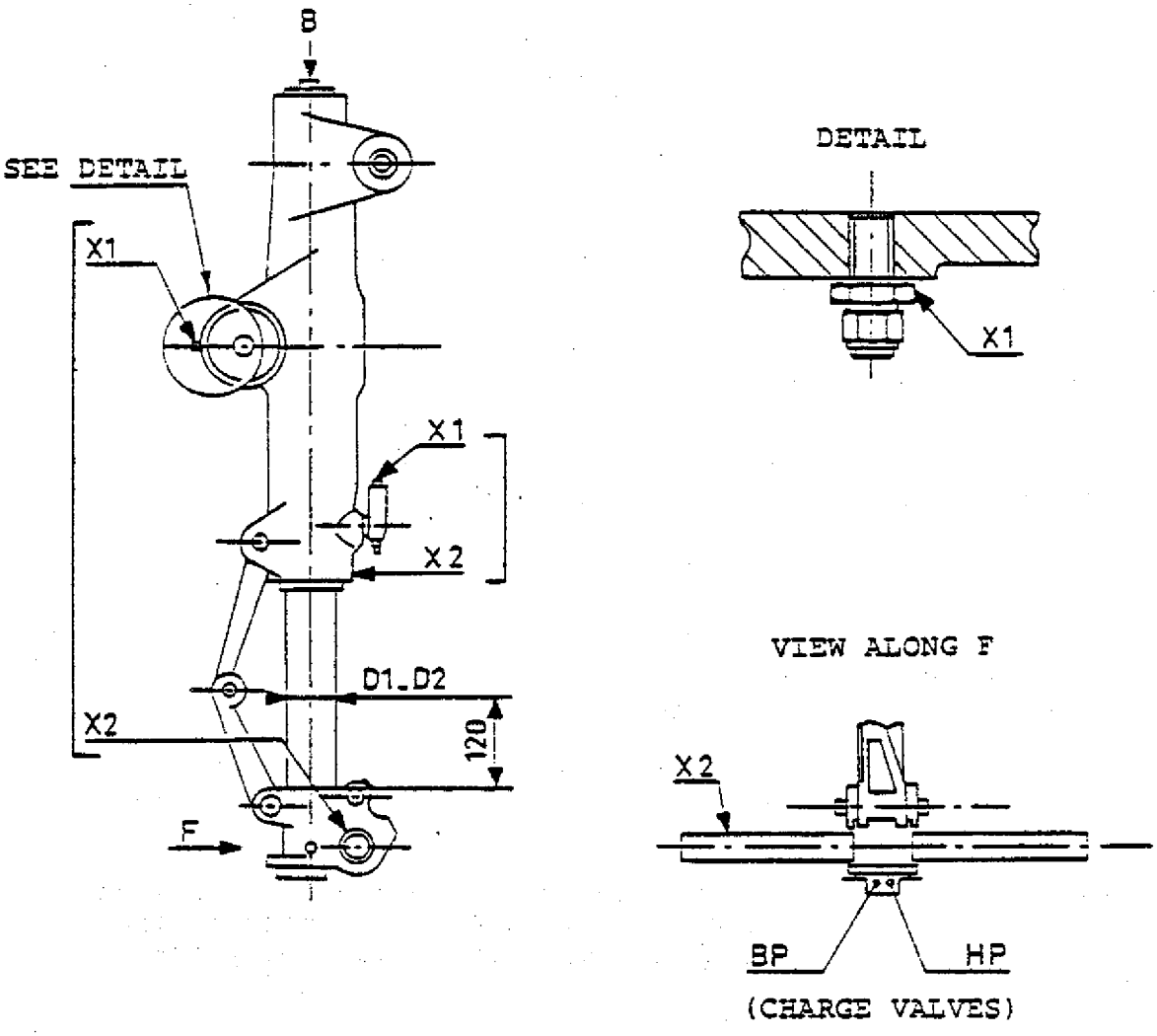
      (3) Compress the shock absorber slowly to its full extent, allowing the fluid to flow out through B.

      (4) Connect the supply to B once more until the shock absorber is fully extended, then compress it fully once more.

      (5) Repeat the purging operation until the fluid is flowing completely free from air bubbles. On completion of the operation, leave the shock absorber in the fully extended condition.

   B. Distortion check

      (1) Drain the HP chamber completely through the HP valve, then inject 250 cm3 (15.25 cu.in) of hydraulic fluid, allowing the excess fluid to escape through B.



Tests

Figure 701

(2) Close the HP valve.

(3) Drain the LP chamber through the LP valve, then inject 50 cm3 (3.05 cu.in) of hydraulic fluid, allowing the excess fluid to escape through B.

(4) Close the LP valve.

(5) Compress the shock absorber by 20 mm (0.78 in), allowing the excess fluid to escape through B. Maintain the undercarriage in this condition by means of the press.

(6) Measure the diameter D1.

(7) Apply a pressure of 263 bars (3813 p.s.i) to B.

(8) Check that after one minute the pressure is not less than 250 bars (3625 p.s.i.)

(9) Release the pressure.

(10) Measure the diameter D2. No distortion is permitted.

3. High pressure fluid level

- Open the HP and LP valves and port B.
- Adjust the fluid level in the chamber to the correct point by injecting nitrogen at a low pressure through the HP inflation valve, then allow excess nitrogen and fluid to escape through the valve. Repeat the operation if necessary.
- Compress the shock absorber fully, allowing the excess fluid to escape through the HP valve and port B.
- Refit the core in the HP inflation valve, using key M3534.

4. Charging of the high-pressure chamber

- Apply a pressure at B until the shock absorber is fully extended, then release the pressure.
- Connect the nitrogen supply to the HP valve and inflate the shock absorber to a pressure of 133 bars (1928 p.s.i), allowing the excess fluid to escape through B and the LP valve.

  Close the HP valve and check it for leaks.

5. Low pressure fluid level

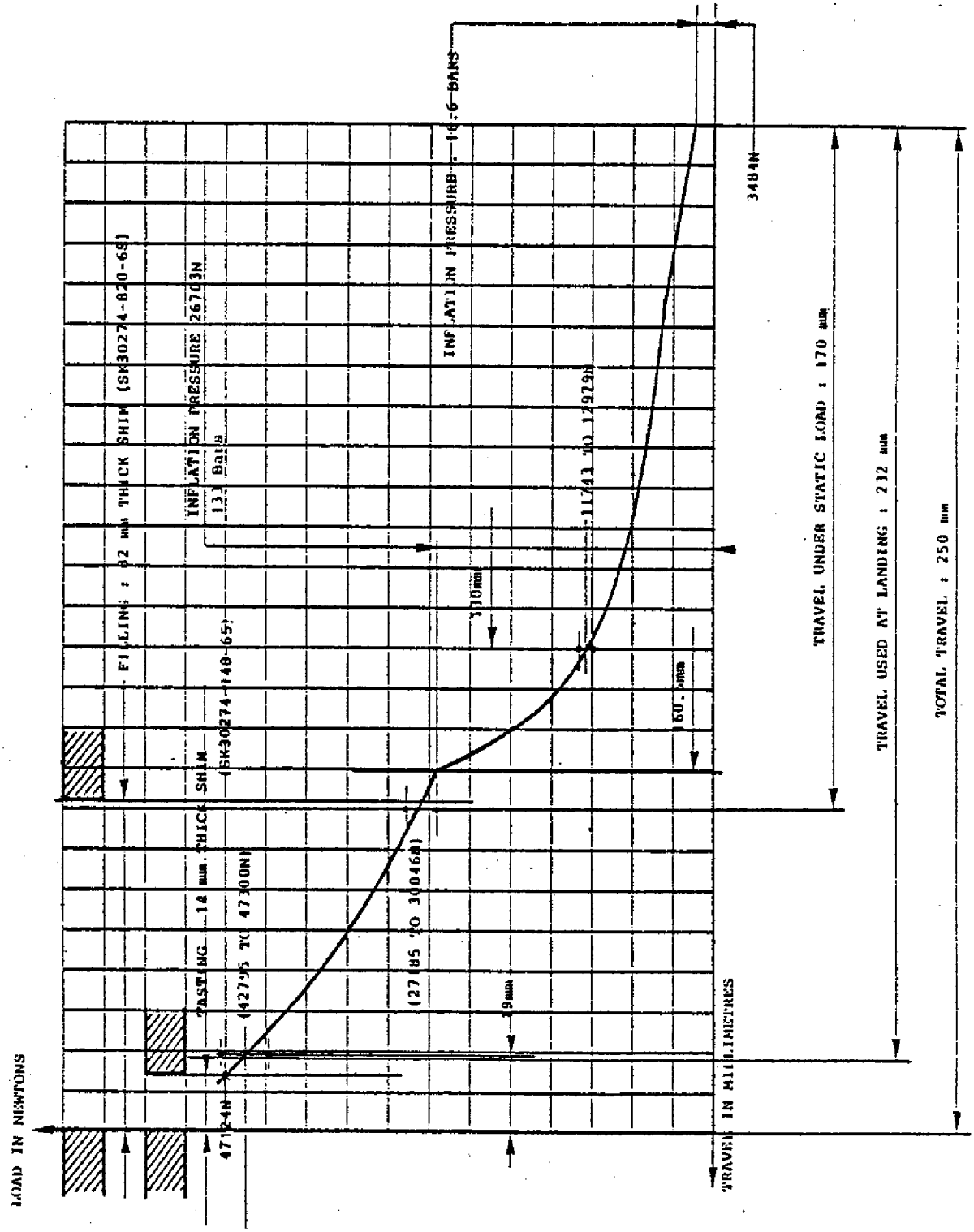
- Compress the shock absorber fully and maintain it in this condition.
- Apply a pressure of 50 bars (725 p.s.i.) at B, release the pressure, then close B.
- Adjust the fluid level in the chamber to the correct point by injecting nitrogen at a low pressure through the LP inflation valve, then allow excess nitrogen and fluid to escape through the valve. Repeat the operation if necessary.

6. Filling of the shock absorber

- Apply a pressure of 50 bars (725 p.s.i.) at B, allowing the shock absorber to extend.
- Release the pressure.
- Fit shim SK 30274-820-65 (82 mm) (3.228 in) in position on the sliding rod.
- Slowly compress the shock absorber until it is stopped by the shim, then maintain it in that condition and allow the excess fluid to escape through B.
- Remove connector SK 20413 from part B and replace plug (158) (figure 1104), complete with its gaskets. Apply a torque loading of 10 $\pm$ 1 Nm (6.637 to 8.112 lbf.ft).

7. Charging of the low-pressure chamber

- Refit the core in the LP inflation valve, using key M3534.
- Connect the nitrogen supply to the LP valve and inflate the shock absorber, allowing it to extend. At full extension, the final pressure must be 16,6 bars (241 p.s.i.).
- Close the LP valve and check it for leaks.
- Remove shim SK 30274-820-65.



Testing

Figure 702

8. Slow-speed operation

- Fit the test shim SK 30274-140-65 (14 mm) (0.551 in) in position on the sliding rod.
- With the shock absorber extended, compress it to achieve a rise rate of 100 ± 10 mm/min (3.937 ± 0.393 in/min, until it is level with the test shim.
- Plot the load curve.
- Allow the shock absorber to extend at the same speed.
- Plot the curve.
- Compare the plotted curves with that on figure 702.
- Depressurise the shock absorber slowly, adhering strictly to the sequence of LP first, followed by HP. Refit the cores and plugs to the inflation valves.

9. Adjustment and checking of the switch (figure 703)

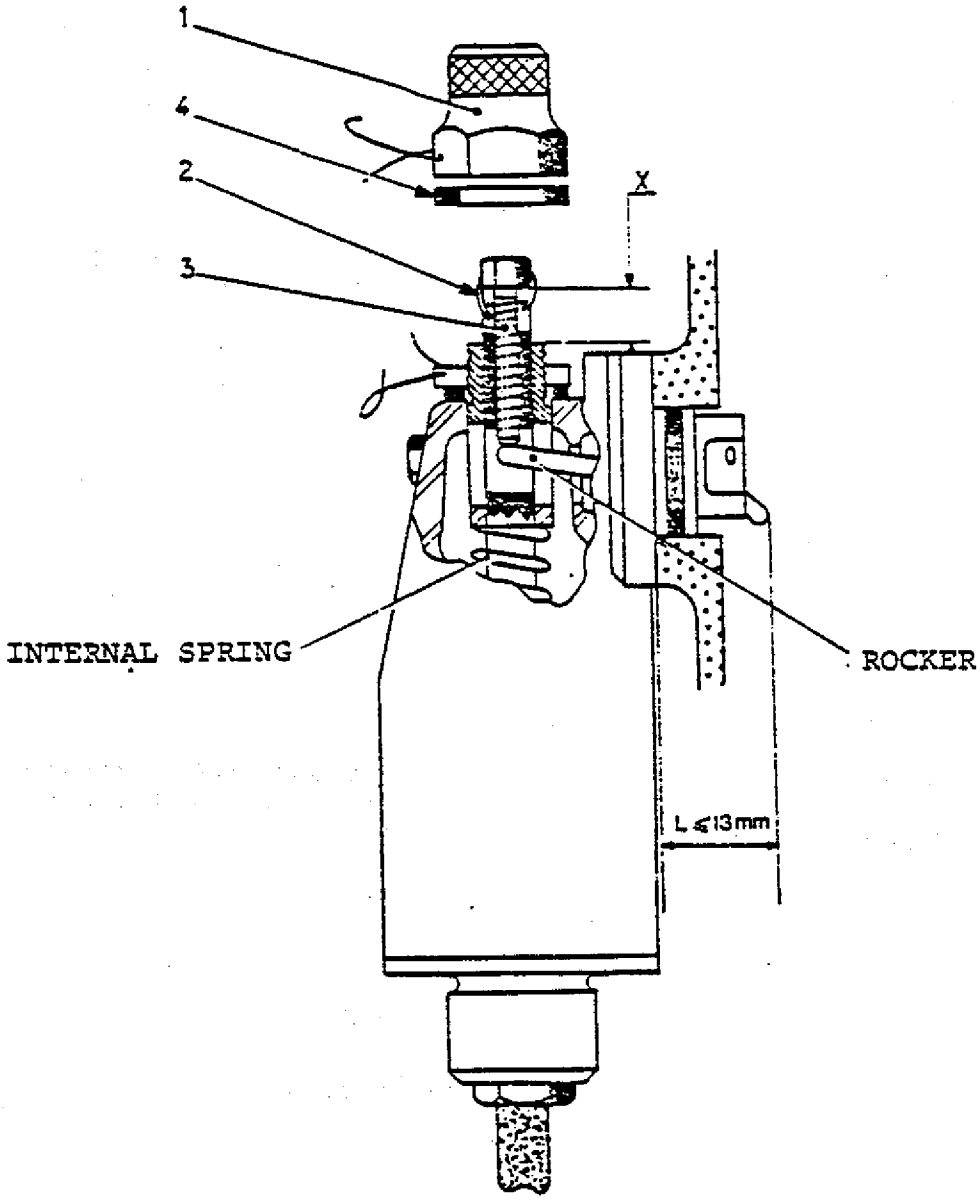
A. Adjustment

(1) Place the leg in the configuration whereby the switch is operated (shock absorber fully extended).

(2) Make sure that the rocker arm on switch (57) (figure 1102) (new or overhauled) is free :

- Remove cap (1), with its gasket (4).
- Remove stop ring (2).
- Make sure that the adjustment screw (3) is unscrewed a distance of X = 10 mm (0.393 in).

(3) Disconnect the moveable connector on the electrical cable from the switch.



Switch adjustment

Test
Figure 703

R (4) Slowly turn the adjustment screw (3), and, using a lamp box, check at the switch connector when there is continuity between terminals :

B and C
E and F

Turn the screw one further turn after this, plus the amount necessary to lock it by means of the stop ring (2).

B. Check of the adjustment

(1) Compress the shock absorber halfway, and check that the contacts reverse when the sliding rod is compressed by :

$8^{+\ 8}_{+\ 0}$ mm ($0.315^{+\ 0.315}_{+\ 0}$ in), and that there is continuity between terminals :

B and A
E and D

R (2) Refit cap (1), with its gasket (4), tighten it by hand and wire-lock it.

10. Insulation testing

In ambient temperature, at a relative humidity not greater than 70%, apply 45 volts DC, and check that the insulation resistance is not less than 20 MΩ between :

- Shock absorber fully extended

Terminals B and A

Terminals E and D

Terminals and earth.

- Shock absorber compressed by 16 mm (0.630 in)

  Terminals B and C

  Terminals E and F

  Terminals and earth.

Reconnect the moveable connector on the electrical cable to the switch.

11. Earth continuity tests

(1) Using test fixture SK20-30162, check that the contact resistance between points X1 and X2 on the leg (see figure 701) is not greater than 8 mΩ.

(2) Make sure that the measurements are not falsified by a parasitic electromotive force (usually thermal in origin), by proceeding as follows :

- Switch off the power supply to the bridge and simultaneously check that the galvanometer does not deflect. If it does so, note the deflection reading and take it as the balance point of the bridge (null point).

NOTE : This opération must be carried out quickly, since the parasitic E.M.F. induced by the heating of the resistance lasts for only a short period after the removal of the power supply.

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TROUBLE-SHOOTING

TROUBLE	POSSIBLE CAUSES	REMEDY
Shock absorber too soft	Fluid leak between LP and HP chambers due to :	
	a) Gaskets on pistons (131) and (167) damaged or turned over (figure 1104)	Replace gaskets (136), (137), (180) and (181)
	b) Scoring in the bore of the sliding rod	Hone or rebore the rod to a repair dimension (see the section REPAIR).
During leak testing, the fluid pressure falls below the permissible tolerance :		
(1) Fluid present on the surface of the sliding rod	a) Leak at piston (143) (figure 1104), due to damage or turning over of the gaskets.	Replace gaskets (145) and (146)
	b) Scoring in the bore of the sliding rod.	Hone or rebore the rod to a repair dimension (see the section REPAIR).
(2) Fluid present around the upper part of the undercarriage.	Leak from filler plug (158) (figure 1104)	After checking the torque loading on the plug, replace gaskets (159) and (160).

TROUBLE-SHOOTING (continued)

TROUBLE	POSSIBLE CAUSES	REMEDY
(3) No visible trace of fluid	Nitrogen leak from inflation valves (188) (figure 1105) :	
	a) At the gaskets	After checking the torque loading on the valves, replace preformed packing (189).
	b) At the valve cores	Tighten the valve cores. If the leak persists, replace them.
	c) At the valve orifices	Replace the valves.
(4) Incorrect operation of the electrical switching	Switch incorrectly adjusted or defective.	- Adjust the switch. - Replace the switch. - Test the switching function.

STORAGE INSTRUCTIONS

1. General

The following instructions describe the measures to be taken to protect rear undercarriage legs which have been overhauled, in order to obtain satisfactory operation after a storage period of 24 months, in temperate continental, tropical or maritime climates.

The measures take into account the mode of transporation used.

2. Storage in temperate continental climates

A. Transport by road, rail or air.

(1) Preservation

(a) Discharge the HP and LP nitrogen chambers, leaving only a residual pressure of 5 bars (72 p.s.i.).

(b) Blank off the free end of hose (250) with dust cap (265).
Blank off the connector on the electrical cable with connector cap (266).

(c) Clean all surfaces which are not :

- painted
- aluminised
- coated with molybdenum grease
- corrosion-resistant
- blanked off with plugs or caps

using White Spirit DCEA/202B (P.D.680), and remove finger marks with Methanol AIR 3650 (OM-232D grade A), or an equivalent product.

(d) Apply to all working areas, after cleaning as described above, a coat of AIR 8136 (MIL-C-11796C class 3) rust-preventive grease, and then wrap them in AIR 8140 category 22 (MIL-B-121C) grease-proof cloth.
Coat the other surfaces which have been cleaned with Protex no.1 - AIR 1502.

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(e) Attach to the leg a suitable amount of AIR 8060 G.A.M. Emb. 01-H (MIL-D-3464C) desiccant, distributed in several bags, with AIR 8140 category 1122 (MIL-B-121B grade A class 1 type 11) greaseproof paper placed between them and the leg. To determine the number of bags of desiccant required, refer to RT22-1A (MIL-P-116D).

(f) Attach to the leg, in such a position that they are visible when the cover is opened :

- A label stating that internal protection is provided by nitrogen at a pressure of 5 bars (72 p.s.i.), and that the unit must be discharged upon introduction into service.

- A label "TOP" (arrow pointing towards the top of the barrel), indicating the storage position which must be maintained.

(g) Place the hose in a hermetically-sealed bag of AIR 8140 category 1122 (MIL-B-121B grade A class 1 type 11) greaseproof paper.

(2) Packaging

(a) Place the leg in a gaboon-batten case in accordance with "MESSIER" specifications.

(b) Place a sheet of AIR 8140 category 1121 (MIL-B-131 class 1) heat-sealable cloth in the bottom of the case.

(c) Fit the necessary blocks in position, check that the passages of the blocks through the heat-sealable cloth are sealed, then secure the former.

(d) Place the undercarriage leg on the supports provided, which should be lined with felt and AIR 8140 category 22 (MIL-B-121C) greaseproof cloth, or foam-rubber pads and AIR 8140 category 1122 (MIL-B-121B grade A class 1 type 11) greaseproof paper.

(e) Fold the heat-sealable cloth to make a cover which fits the general shape of the leg as closely as possible. Heat-seal, leaving a strip of cloth wide enough to allow the cover to be re-used at least three times before it needs to be replaced.

(f) Fix to the cover, in such a way that they are visible when the cover is opened :

- an identification label,
- a label indicating the storage date and duration, and the storage mode, if applicable,
- a label "TOP", indicating the storage position which must be maintained - and which must be checked as being in agreement with that fixed to the leg,
- a label stating that the sealed package contains a desiccant and that it should be opened only when the leg is put into service,
- a label giving the Part Number of the assembly and the sub-assemblies,
- a label stating that the cover is reusable and that it must be cut along a broken line when it is opened.

(g) Close the case and affix labels identical to those fixed to the cover, with the exception of the lastmentioned. The "TOP" label should however be stencilled, on two adjacent faces, and must be in agreement with that fixed to the cover.

(3) Storage

(a) Store the rear undercarriage leg in its packaging in an approximately vertical position, to comply with the "TOP" indication stencilled on the case.

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(b) For legs whose guaranteed storage life has been exceeded, the latter may be extended subject to a satisfactory check of the state of preservation of a sample taken from the equipment in store.

The duration of this new storage period will depend on the results of the above check.

B. Transport by sea

The requirements stated in paragraph 2.A are also applicable to storage in temperate continental climates, with transport by sea.

3. Storage in tropical or maritime climates

The requirements for storage in tropical or maritime climates are the same as those given in paragraph 2.

4. Removal from store

Overhauled and stored rear undercarriage legs must not be removed from store until they are required for use (installation), and on a first-in, first-out basis.

Take off the AIR 8140 category 22 (MIL-B-121C) greaseproof cloth and remove the AIR 8136 (MIL-C-11796C class 3) rust-preventative grease from all areas so coated with a dry rag or White Spirit DCEA/202B (P.D.680).

Remove the protective storage caps from the end of the hose and from the connector on the electrical cable.

Inflate the HP and LP gas chambers to the normal operating pressures.

SPECIAL TOOLS AND EQUIPMENT

PART NUMBER	DESIGNATION	USE
C47606	Wrench	Nut (28, fig.1101)
C46830	Wrench	Base (26, fig.1101)
C46535	Wrench	Nut (53, fig.1102)
61785	Wrench	Restrictor (120, fig. 1104)
C47456	Wrench	Nut (128, fig. 1104)
C46093	Screwdriver	Screw (129, fig. 1104)
C47602	Wrench	Nut (148, fig. 1104)
C46831	Wrench	Threaded bushing (150, fig.1104)
PR47689	Wrench	Nut (156, fig.1104)
61788	Wrench	Pin (35, fig.1101)
C46827	Soft Jaws	Bottom base (164, fig.1104)
61800	Wrench	Nut (178, fig.1104)
63693	Soft jaws	Piston (167, fig.1104)
C46797	Soft jaws	Sliding rod (91, fig.1103)
C47604	Soft jaws	Column (138, fig.1104)
C47439	Wrench	Threaded bush (174, fig.1104)
C47605	Extractor	Piston assembly (130, fig.1104)
64313	Pin	Installation of sliding rod (91) in axle pot (92) (fig. 1103)
64314	Pin	Installation of axle (95) in axle pot (92) (fig.1103)
C46762	Pin	Check of torque arm geometry
89901	Spatula	Seals
A46524	Spatula	Seals
SK20413	Filing connector	Shock absorber tests
SK30274-820-65	Shim	Shock absorber tests
SK30274-140-65	Shim	Shock absorber tests

SPECIAL TOOLS AND EQUIPMENT (continued)

PART NUMBER	DESIGNATION	USE
SK20-30162	Rig	Electrical tests
D21926	Voltage drop tester	Electrical tests
SK48-30112-1000	Electrical cable	Electrical tests
SK-30476	Hydraulic generation unit	Tests
SK-30478	Test panel	Tests
D21936-1002	Set of connections	Tests
F21840	Attachment fixture	Tests
SK1-20941	Adaptor	Tests
M3534	Key	Tests

MESSIER-HISPANO-BUGATTI

OVERHAUL MANUAL

ILLUSTRATED PARTS LIST

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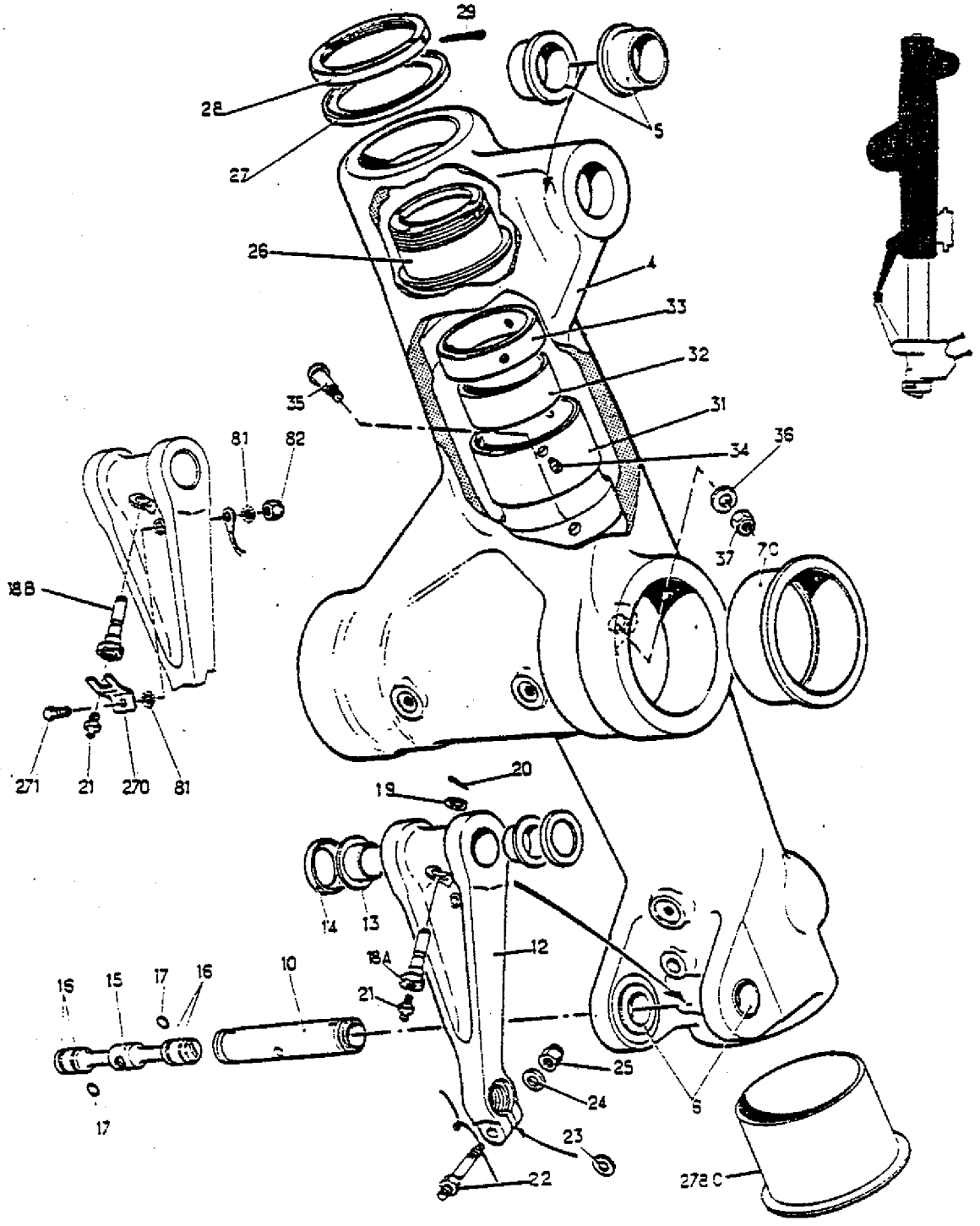


Rear undercarriage legs
Figure 1101

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1101-1B	C22093-10-2	LEG-REAR UNDERCARRIAGE (Amendt. A)		REF
-1D	C22093-1003	LEG-REAR UNDERCARRIAGE POST SB 32-243		REF
-1F	C22093-1004	LEG-REAR UNDERCARRIAGE POST SB 32-238 POST SB 32-240		REF
-1H	C22093-1005	LEG-REAR UNDERCARRIAGE POST SB 32-242		REF
-1K	C22093-1006	LEG-REAR UNDERCARRIAGE POST SB 32-241		REF
-1M	C22093-2006	LEG-REAR UNDERCARRIAGE POST SB 32-241		REF
-2B	EP5385-10	.BARREL COMPLETE	1BD	1
-2D	GA59910	.BARREL COMPLETE POST SB 32-238	1F	1
-2F	GA59910-1	.BARREL COMPLETE POST SB 32-240	1FM	1
-2H	GA59910-2	.BARREL COMPLETE POST SB 32-242	1HK	1
-3B	GA54234-10	..BARREL ASSY	2B	1
-3D	GA54234-11	..BARREL ASSY POST SB 32-238	2D	1
-3F	GA54234-12	..BARREL ASSY POST SB 32-240	2F	1
-3H	GA54234-13	..BARREL ASSY POST SB 32-242	2H	1
-268	GA55656	...BARREL BUSHED	3B	1
-268	GA55656-1	...BARREL BUSHED POST SB 32-238	3D	1
-268	GA55656-2	...BARREL BUSHED POST SB 32-240	3F	1
-268	GA59918	...BARREL BUSHED POST SB 32-242	3H	1
-4B	C54862	....BARREL	268B	1
-4D	C54862-1	....BARREL POST SB 32-238	268DF	1
4F	D54142	....BARREL POST SB 32-242	268H	1
-5B	C49691	....BUSHING	268BD 268F	2
5D	D54138	....BUSHING POST SB 32-242	268H	2

-Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1101-278B	D54529	....BUSHING POST SB 32-238	268DF	1
278D	D54529-1	....BUSHING POST SB 32-242	268E	1
-7B	GA54225	....BUSHING ASSEMBLY	268BD	2
7D	D54535	....BUSHING POST SB 32-240	268FH	2
8	C54880	.....BUSHING MATCHED WITH PART 9 NP		2
9	C55679	.....BUSHING MATCHED WITH PART 8 NP		2
10	EBC55217	...PIN MATCHED WITH PARTS 6 AND 13		1
-11	GA54235	...ARM BUSHED		1
12	C1-54861	....ARM TORQUE MATCHED WITH PART 13		
13	C55216	....BUSHING MATCHED WITH PART 12		2
14	C55222	...WASHER		2
15	C68624	...DISTRIBUTOR GREASE		1
16	BT9-3	...PACKING PREFORMED		4
17	BT6-2	...PACKING PREFORMED		2
18B	C55219-1	...PIN	2B	1
19	C55220	...WASHER		1
20	23310AA020015LE	...PIN COTTER (V-F0110)		1
21	L22811-1	...NIPPLE GREASE (V-F0111)		1
270	C61966	...PLATE LOCK	2B	1
271	L22208-40-16BCL	...BOLT (V-F0111)	2B	1
81	E27618E40AJTL	...WASHER (V-F0110)		2
82	22542K040	...NUT (V-F0111)		1
22	C55560	...BOLT		1
23	1-98111	...WASHER		1
24	23111BC060LE	...WASHER (V-F0111)		1
25	22542K060	...NUT (V-F0111)		1
26	C54860	..BASE		1
27	C56199	..WASHER		1
28	C55496	..WASHER		1
29	23310AA030025LE	..PIN COTTER (V-F0110)		1
-30B	GA54238	..GUIDE ASSEMBLY	2B	1
-30D	GA54238-1	..GUIDE ASSEMBLY POST SB 32-238	2DFH	1
-31B	C55206	...CAGE	30B	1
31D	C55206-1	...CAGE	30D	1
32	A496-60701	...GUIDE		1
33	C55638	...BUSHING		1
34	C55639	...SCREW		3
35	C55606	..PIN		1
36	C55607	..WASHER		1
37	22542K080	..NUT (V-F0111)		1

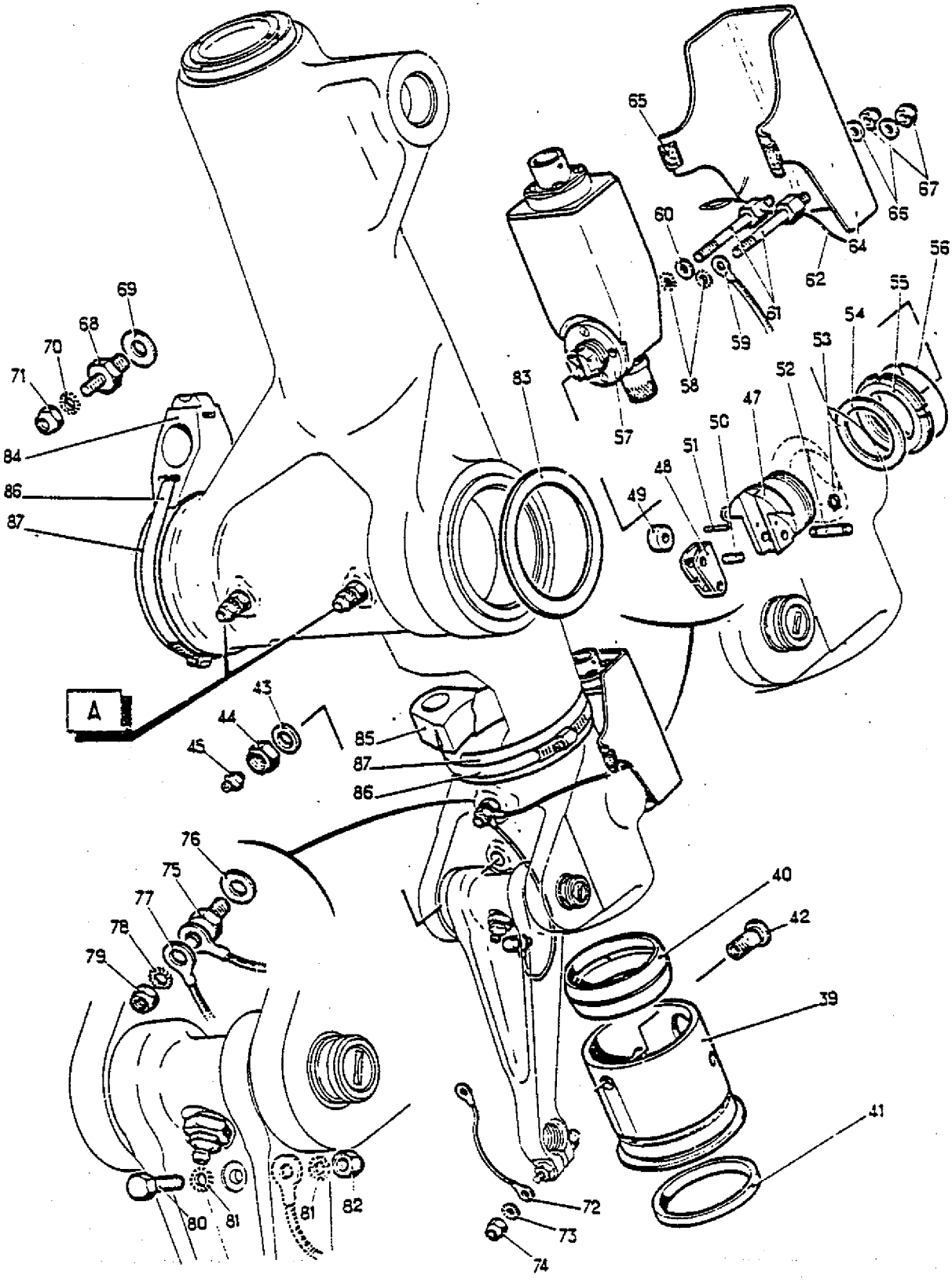
- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1101-1A	C22093M2	LEG-REAR UNDERCARRIAGE (Amendt. A)		REF
-1C	C22093-3	LEG-REAR UNDERCARRIAGE POST SB 32-243		REF
-1E	C22093-4	LEG-REAR UNDERCARRIAGE POST SB 32-238 POST SB 32-240		REF
-1G	C22093-5	LEG-REAR UNDERCARRIAGE POST SB 32-242		REF
-1J	C22093-6	LEG-REAR UNDERCARRIAGE POST SB 32-241		REF
-1L	C22093-106	LEG-REAR UNDERCARRIAGE POST SB 32-241		REF
-2A	EP5385-3	.BARREL COMPLETE	1AC	1
-2C	GA59909	.BARREL COMPLETE POST SB 32-238	1E	1
-2E	GA59909-1	.BARREL COMPLETE POST SB 32-240	1EL	1
-2G	GA59909-2	.BARREL COMPLETE POST SB 32-242	1GJ	1
-3A	GA54234-1	..BARREL ASSY	2A	1
-3C	GA54234-2	..BARREL ASSY POST SB 32-238	2C	1
-3E	GA54234-3	..BARREL ASSY POST SB 32-240	2E	1
-3G	GA54234-4	..BARREL ASSY POST SB 32-242	2G	1
-268	GA55656	...BARREL BUSHED	3A	1
-268	GA55656-1	...BARREL BUSHED POST SB 32-238	3C	1
-268	GA55656-2	...BARREL BUSHED POST SB 32-240	3E	1
-268	GA59918	...BARREL BUSHED POST SB 32-242	3G	1
-4A	C54862	....BARREL	268A	1
-4C	C54862-1	....BARREL POST SB 32-238	268CE	1
4E	D54142	....BARREL POST SB 32-242	268G	1
-5A	C49691	....BUSHING	268AC 268E	2
5C	D54138	....BUSHING POST SB 32-242	268G	2
-6A	C55215	....BUSHING	268ACE	2
6C	D54139	....BUSHING POST SB 32-242	268G	2 -

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1101-278A	D54529	....BUSHING POST SB 32-238	268CE	1
278C	D54529-1	....BUSHING POST SB 32-242	268G	1
-7A	GA54225	....BUSHING ASSEMBLY	268AC	2
7C	D54535	....BUSHING POST SB 32-240	268EG	2
-8	C54880	.....BUSHING MATCHED WITH PART 9 NP	7A	2
-9	C55679	.....BUSHING MATCHED WITH PART 8 NP	7A	2
10	EBC55217	...PIN MATCHED WITH PARTS 6 AND 13		1
-11	GA54235	...ARM BUSHED		1
12	C1-54861	....AMR TORQUE MATCHED WITH PART 13		1
13	C55216	....BUSHING MATCHED WITH PART 12		2
14	C55222	...WASHER		2
15	C68624	...GREASE DISTRIBUTOR		1
16	BT9-3	...PACKING PREFORMED		4
17	BT6-2	...PACKING PREFORMED		2
18A	C55219	...PIN		1
19	C55220	...WASHER		1
20	23310AA020015LE	...PIN SPLIT (V-F0110)		1
21	L22811-1	...NIPPLE GREASE (V-F0111)		1
22	C55560	...BOLT		1
23	1-98111	...WASHER		1
24	23111BC060LE	...WASHER (V-F0111)		1
25	22542K060	...NUT (V-F0111)		1
26	C54860	..BASE		1
27	C56199	..WASHER		1
28	C55496	..NUT		1
29	23310AA030025LE	..PIN SPLIT (V-F0110)		1
-30A	GA54238	..GUIDE ASSEMBLY	2A	1
-30C	GA54238-1	..GUIDE ASSEMBLY POST SB 32-238	2CEG	1
-31A	C55206	...CAGE	30A	1
-31C	C55206-1	...CAGE	30C	1
32	A496-60701	...GUIDE		1
33	C55638	...BUSHING		1
34	C55639	...SCREW		3
35	C55606	..PIN		1
36	C55607	..WASHER		1
37	22542K080	..NUT (V-F0111)		1

- Item not illustrated



Rear undercarriage legs
Figure 1102

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1102-38B	GA54239	..BALL JOINT BEARING ASSEMBLY	2B	1
-38D	GA54239-1	..BALL JOINT BEARING ASSEMBLY POST SB 32-238	2DFH	1
-39B	C54873	...CAGE MATCHED WITH PART 40	38B	1
39D	C54873-1	...CAGE MATCHED WITH PART 40 POST SB 32-238	38D	1
40	C54874	...BALL MATCHED WITH PART 41		1
41	C41-54001	..SCRAPER RING		1
42	C55508	..PIN		1
43	L23111-100BCL	..WASHER (V-F0111)		1
44	L22542-100K	..NUT (V-F0111)		1
45	L22811-1	..NIPPLE GREASE (V-F0111)		1
-46B	GA54240	..BASE ASSEMBLY	2B	1
-46D	GA54240-1	..BASE ASSEMBLY POST SB 32-238	2DFH	1
-46F	GA60089	..BASE ASSEMBLY POST SB 32-238	2DFH	1
-279	D54530	...WASHER POST SB 32-238	46D	1
47	C55499	...BASE	46D	1
-47A	D54531	...BASE POST SB 32-238	46F	1
48	C59345	...CARRIER ROLLER		1
49	A65120	...ROLLER		1
50	C55502	...PIN		1
51	C55642	...PIN		1
52	C55501	...PIN		1
53	23203AM0023T	...RING STOP (V-F0111)		2
54	C55751	..WASHER		1
55	C55500	..NUT		1
56	C50221-10-08-8	..RING STOP		1
57	C1-22606	..SWITCH (SEE 32-60-02)		1
58	E27618E40AJTL	..WASHER (V-F0110)		2
59	C4-51000-200	..STRIP BONDING		1
60	23111BC040LE	..WASHER (V-F0111)		1
61	C55503	..BOLT		2
62	23320CA063	..WIRE STAINLESS STEEL DO-63 (V-F0111)		AR
-63	GA54527	..COVER PROTECTIVE ASSEMBLY		1
64	C55504	...COVER PROTECTIVE		1
65	A88-60700	...EXTRUSION RUBBER		2
66	23111BC040LE	..WASHER (V-F0111)		2
67	22542K040	..NUT (V-F0111)		2
68	C51081	..BOLT		2
69	23111BC060LE	..WASHER (V-F0111)		2
70	E27618E40AJTL	..WASHER (V-F0110)		2

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1102-38A	GA54239	..BALL JOINT BEARING ASSEMBLY	2A	1
-38C	GA54239-1	..BALL JOINT BEARING ASSEMBLY POST SB 32-238	2CEG	1
-39A	C54873	...CAGE MATCHED WITH PART 40	38A	1
39C	C54873-1	...CAGE MATCHED WITH PART 40 POST SB 32-238	38C	1
40	C54874	...BALL MATCHED WITH PART 41		1
41	C41-54001	..SCRAPER RING		1
42	C55508	..PIN		1
43	L23111-100BCL	..WASHER (V-F0111)		1
44	L22542-100K	..NUT (V-F0111)		1
45	L22811-1	..NIPPLE GREASE (V-F0111)		1
-46A	GA54240	..BASE ASSEMBLY	2A	1
-46C	GA54240-1	..BASE ASSEMBLY POST SB 32-238	2CEG	
-46E	GA60089	..BASE ASSEMBLY POST SB 32-238	2CEG	1
-279	D54530	...WASHER POST SB 32-238	46C	1
47	C55499	...BASE	46C	1
47A	D54531	...BASE POST SB 32-238	46E	1
48	C59345	...CARRIER ROLLER		1
49	A65120	...ROLLER		1
50	C55502	...PIN		1
51	C55642	...PIN		1
52	C55501	...PIN		1
53	23203AM0023T	...RING-STOP (V-F0111)		2
54	C55751	..WASHER		1
55	C55500	..NUT		1
56	C50221-10-08-8	..RING STOP		1
57	C1-22606	..SWITCH (SEE 32-60-02)		1
58	E27618E40AJTL	..WASHER (V-F0110)		2
59	C4-51000-200	..STRIP BONDING		1
60	23111BC040LE	..WASHER (V-F0111)		1
61	C55503	..BOLT		2
62	23320CA063	..WIRE STAINLESS STEEL DO-63 (V-F0111)		AR
-63	GA54527	..COVER PROTECTIVE ASSEMBLY		1
64	C55504	...COVER PROTECTIVE		1
65	A88-60700	...EXTRUSION RUBBER		2
66	23111BC040LE	..WASHER (V-F0111)		2
67	22542K040	..NUT (V-F0111)		2
68	C51081	..BOLT		2
69	23111BC060LE	..WASHER (V-F0111)		2
70	E27618E40AJTL	..WASHER (V-F0110)		2

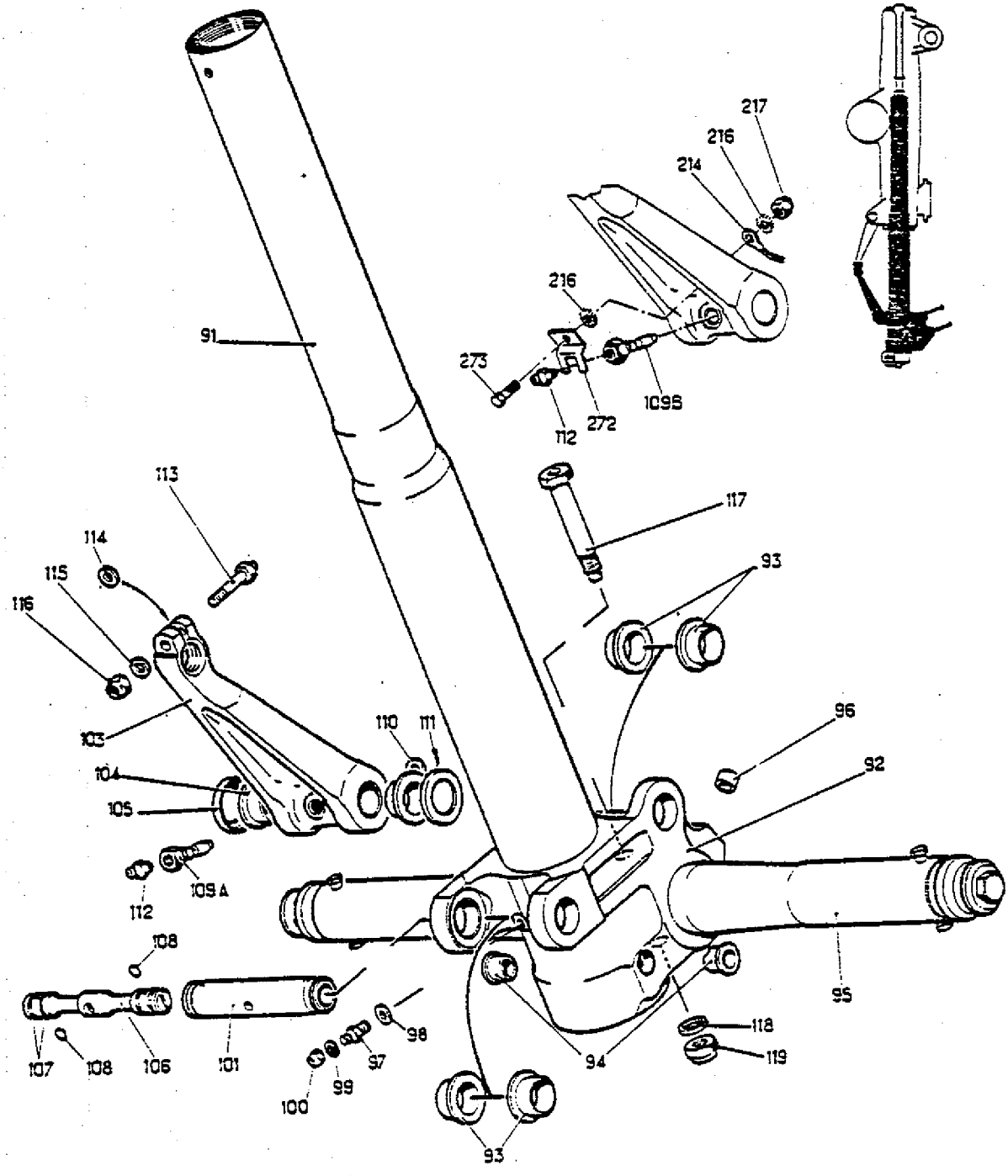
- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1102 71	22542K040	..NUT (V-F0111)		2
72	C4-51000-100	..STRIP BONDING		1
73	E27618E40AJTL	..WASHER (V-F0110)		1
74	22542K040	..NUT (V-F0111)		1
75	C51081	..BOLT		1
76	23111BC060LE	..WASHER (V-F0111)		1
77	C4-51000-150	..STRIP BONDING		1
78	E27618E40AJTL	..WAHSER (V-F0110)		1
79	22452K040	..NUT (V-F0111)		1
83	C55722	..WASHER		1
84	C57736	..MOUNT		1
85	C57737	..MOUNT		1
86	MINOXS5	..CLAMP (V-F2560)		1
269	MINOXS6	..CLAMP (V-F2560)		1
87	SCOTCHRAP	..TAPE ADHESIVE (V-F0347)		AR

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1102 71	22542K040	..NUT (V-F0111)		2
72	C4-51000-100	..STRIP BONDING		1
73	E27618E40AJTL	..WASHER (V-F0110)		1
74	22542K040	..NUT (V-F0111)		1
75	C51081	..BOLT		1
76	23111BC060LE	..WASHER (V-F0111)		1
77	C4-51000-150	..STRIP BONDING		1
78	E27618E40AJTL	..WASHER (V-F0110)		1
79	22542K040	..NUT (V-F0111)		1
80	L22208-40-14BCL	..SCREW (V-F0111)		1
81	E27618E40AJTL	..WASHER (V-F0110)		2
82	L22542-40K	..NUT (V-F0111)		1
83	C55722	..WASHER		1
84	C57736	..MOUNT		1
85	C57737	..MOUNT		1
86	MINOXS5	..CLAMP (V-F2560)		1
269	MINOXS6	..CLAMP (V-F2560)		1
87	SCOTCHRAP50-1IN	..TAPE ADHESIVE (V-F0347)		AR

- Item not illustrated



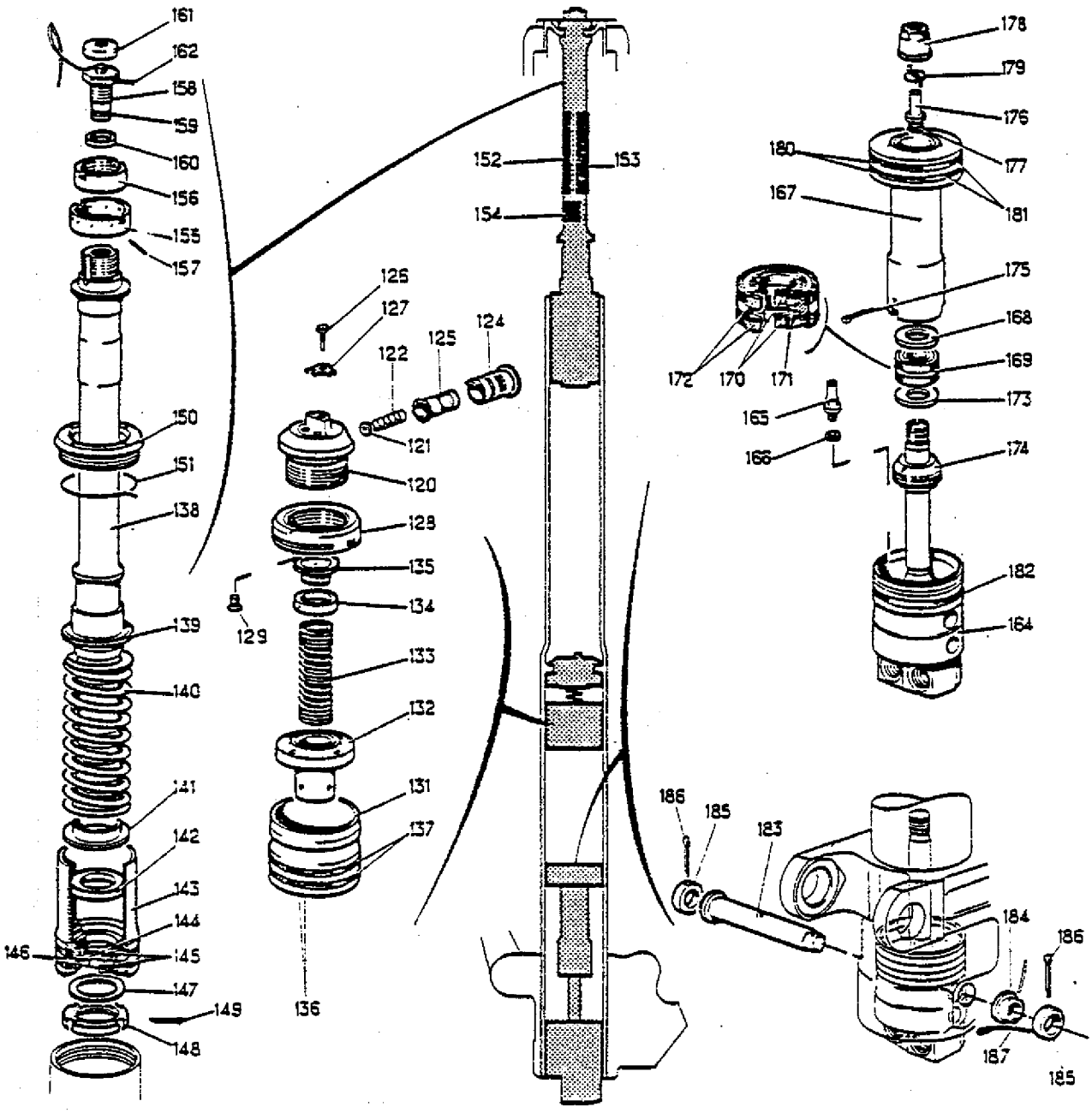
Rear undercarriage legs
Figure 1103

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1103-88B	GA58370-1	.ROD COMPLETE	1B	1
-88D	GA59450	.ROD COMPLETE POST SB 32-243	1DFHK	1
-89B	GA54241-10	..ROD ASSEMBLY	88BD	1
-90	GA54123	...ROD MATCHED		1
91	C54856	....ROD SLIDING		1
92	C1-54855	....AXLE POT		1
93	C55215	....BUSH		4
94	C55225	....BUSH		2
95	C55204	....AXLE		1
96	A1-66449	....BUSH		2
97	C1-51081	...BOLT		1
98	23111BC060LE	...WASHER (V-F0111)		1
99	E27618E40AJTL	...WASHER (V-F0110)		1
100	22542K040	...NUT (V-F0111)		1
101	EBC55217	...PIN MATCHED WITH PARTS 93 ANT 104		1
-102	GA54235	...ARM BUSHED		1
103	C1-54861	....ARM TORQUE MATCHED WITH PART 104		1
104	C55216	....BUSH MATCHED WITH PART 103		2
105	C55222	...WASHER		2
106	C68624	...DISTRIBUTOR GREASE		1
107	BT9-3	...PACKING PREFORMED		4
108	BT6-2	...PACKING PREFORMED		2
109B	C55219-1	...PIN		1
110	C55220	...WASHER		1
111	23310AA020015LE	...PIN SPLIT (V-F0110)		1
112	L22811-1	...NIPPLE GREASE (V-F0111)		1
272	C61966	...PLATE LOCK		1
273	L22208-40-16BCL	...BOLT (V-F0111)		1
216	E27618E40AJTL	...WASHER (V-F0110)		1
214	C44-51000-130	...STRIP BONDING		1
216	E27618E40AJTL	...WASHER (V-F0110)		1
217	22542K040	...NUT (V-F0111)		1
113	C55560	...SCREW		1
114	1-98111	...WASHER		1
115	23111BC060LE	...WASHER (V-F0111)		1
116	22542K060	...NUT (V-F0111)		1
117	C55224	...PIN		1
118	23111BC100LE	...WASHER (V-F0111)		1
119	22542K100	...NUT (V-F0111)		1

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1103-88A	GA58369-1	.ROD COMPLETE	1A	1
-88C	GA59448	.ROD COMPLETE POST SB 32-243	1CEGJ	1
-89A	GA54241-1	..ROD ASSEMBLY	88AC	1
-90	GA54123	...ROD MATCHED		1
91	C54856	....ROD SLIDING		1
92	C1-54855	....AXLE POT		1
93	C55215	....BUSH		4
94	C55225	....BUSH		2
95	C55204	....AXLE		1
96	A1-66449	....BUSH		2
97	C1-51081	...BOLT		1
98	23111BC060LE	...WASHER (V-F0111)		1
99	E27618E40AJTL	...WASHER (V-F0110)		1
100	22542K040	...NUT (V-F0111)		1
101	EBC55217	...PIN MATCHED WITH PARTS 93 AND 104		1
-102	GA54235	...ARM BUSHED		1
103	C1-54861	....ARM TORQUE MATCHED WITH PART 104		1
104	C55216	....BUSH MATCHED WITH PART 103		2
105	C55222	...WASHER		2
106	C68624	...DISTRIBUTOR GREASE		1
107	BT9-3	...PACKING PREFORMED		4
108	BT6-2	...PACKING PREFORMED		2
109A	C55219	...PIN	89A	1
110	C55220	...WASHER		1
111	23310AA020015LE	...PIN SPLIT (V-F0110)		1
112	L22811-1	...NIPPLE GREASE (V-F0111)		1
113	C55560	...SCREW		1
114	1-98111	...WASHER		1
115	23111BC060LE	...WASHER (V-F0111)		1
116	22542K060	...NUT (V-F0111)		1
117	C55224	...PIN		1
118	23111BC100LE	...WASHER (V-F0111)		1
119	22542K100	...NUT (F0111)		1

- Item not illustrated



Rear undercarriage legs
Figure 1104

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1104-120	C54879-1	..RESTRICTOR		1
121	C50171	..PLUG ORIFICE		1
122	2730-97500	..SPRING		1
-123	GA53134	..SPOOL MATCHED		1
124	C50168	...CYLINDER MATCHED WITH PART 125		1
125	C50169	...SPOOL MATCHED WITH PART 124		1
126	C50170	..SCREW		1
127	23350CA040	..LOCK WASHER (V-F0111)		1
128	C50172	..NUT		1
129	C55641	..SCREW		1
-130	GA53099	..PISTON ASSEMBLY		1
131	C1-50588	...PISTON		1
132	C1-50882	...SOCKET		1
133	C1-50160	...SPRING		1
134	C55868	...CUP		1
135	C1-50161	...VALVE		1
136	SI58Z	..GASKET		2
137	SA58Z	..GASKET		2
-138B	C55628	..COLUMN	88B	1
138D	C55628-1	..COLUMN POST SB 32-243	88D	1
139	C55634	..GUIDE		1
140	1769-97500	..SPRING		1
141	C55633	..CUP		1
142	C55629	..RING		1
143	C55630	..PISTON		1
144	JI25Z	..GASKET		1
145	SI48Z	..GASKET		2
146	SA48Z	..GASKET		2
147	C55631	..WASHER		1
148	C55632	..NUT		1
149	C55640	..PIN SPLIT		1
150	C55643	..BUSHING THREADED		1
151	C50222-10-10-4	..RING STOP		1
152	C16-53380	..PLATE		1
153	C32-53380	..PLATE		1
154	A1-71807	..PLATE		1
-155B	C49694	..CUP	88B	1
155D	C49694-1	..CUP POST SB 32-243	88D	1
156	C49695	..NUT		1
157	23310AA020015LE	..PIN SPLIT		1
-158B	C1-52891	..PLUG	88B	1
158D	D53191	..PLUG POST SB 32-243	88D	1
159	JE10-5Z	..GASKET		1
160	88022-12-4	..GASKET		1

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1104 120	C54879-1	..RESTRICTOR		1
121	C50171-1	..PLUG ORIFICE		1
122	2730-97500	..SPRING		1
-123	GA53134	..SPOOL MATCHED		1
124	C50168	...CYLINDER MATCHED WITH PART 125		1
125	C50169	...SPOOL MATCHED WITH PART 124		1
126	C50170	..SCREW		1
127	23350CA040	..LOCK WASHER (V-F0111)		1
128	C50172	..NUT		1
129	C55641	..SCREW		1
-130	GA53099	..PISTON ASSEMBLY		1
131	C1-50588	...PISTON		1
132	C1-50882	...SOCKET		1
133	C1-50160	...SPRING		1
134	C55868	...CUP		1
135	C1-50161	...VALVE		1
136	SI58Z	..GASKET		2
137	SA58Z	..GASKET		2
-138A	C55628	..COLUMN	88A	1
138C	C55628-1	..COLUMN POST SB 32-243	88C	1
139	C55634	..GUIDE		1
140	1769-97500	..SPRING		1
141	C55633	..CUP		1
142	C55629	..RING		1
143	C55630	..PISTON		1
144	JI25Z	..GASKET		1
145	SI48Z	..GASKET		2
146	SA48Z	..GASKET		2
147	C55631	..WASHER		1
148	C55632	..NUT		1
149	C55640	..PIN SPLIT		1
150	C55643	..BUSHING THREADED		1
151	C50222-10-10-4	..RING STOP		1
152	C16-53380	..PLATE		1
153	C32-53380	..PLATE		1
154	A1-71807	..PLATE (FOR SPARES)		1
-155A	C49694	..CUP	88A	1
155C	C49694-1	..CUP POST SB 32-243	88C	1
156	C49695	..NUT		1
157	23310AA020015LE	..PIN SPLIT		1
-158A	C1-52891	..PLUG	88A	1
158C	D53191	..PLUG POST SB 32-243	88C	1
159	JE10-5Z	..GASKET		1
160	38022-12-4	..GASKET		1

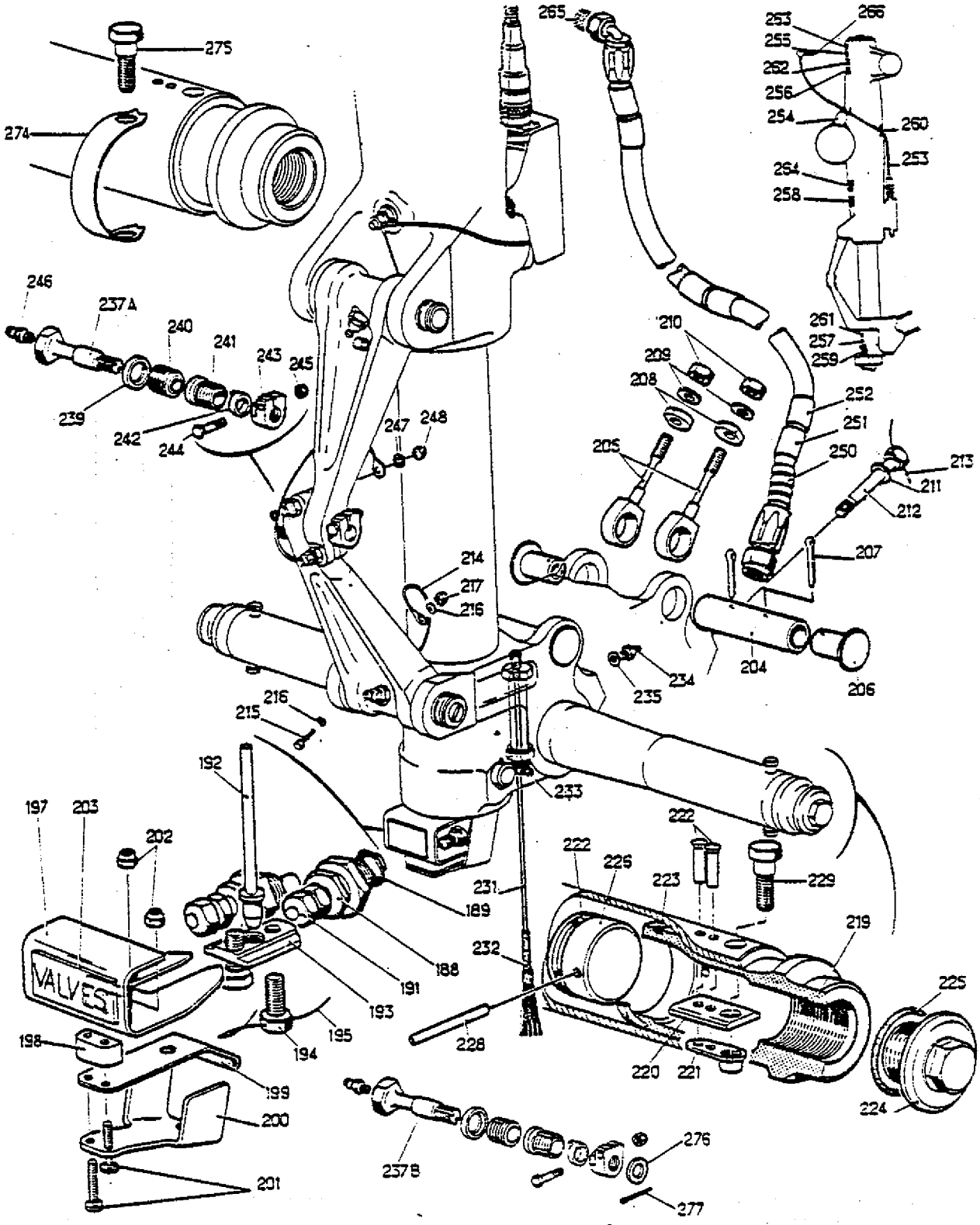
- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1104 161B	A55500	..CAP	88B	1
161D	D53190	..CAP	88D	1
		POST SB 32-243		
-162	23320CA063	..WIRE STAINLESS STEEL DO-63 (V-F0111)		AR
-163	GA54242	..BOTTOM BASE ASSEMBLY		1
164	C54857	...BOTTOM BASE WITH PLUG		1
165	C55881	...TUBE LEVEL		1
166	88022-6-1	...GASKET		1
167	C55870	...PISTON		1
168	C55872	...WASHER		1
169	C55871	...HOLDER PACKING		1
170	GA13Z	...GASKET		2
171	GE13Z	...GASKET		2
172	JE27Z	...GASKET		2
173	C55872	...WASHER		1
174	C55873	...BUSH THREADED		1
175	23310AA015012LE	...PIN SPLIT (V-F0110)		1
176	C56385	...TUBE LEVEL		1
177	JE67Z	...GASKET		1
178	C56386	...NUT		1
179	C56387	...LOCK WASHER		1
180	SI58Z	..GASKET		2
181	SA58Z	..GASKET		2
182	JE58Z	..GASKET		1
183	C55511	..PIN		1
184	C55513	..BUSH		1
185	C55512	..WASHER		2
186	23310AA020030LE	..PIN SPLIT (V-F0110)		2
187	23320CA063	..WIRE STAINLESS STEEL DO-63		AR

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1104 161A	A55500	..CAP	88A	1
161C	D53190	..CAP POST SB 32-243	88C	1
-162	23320CA063	..WIRE STAINLESS STEEL DO-63 (V-F0111)		AR
-163	GA54242	..BOTTOM BASE ASSEMBLY		1
164	C54857	...BOTTOM BASE WITH PLUG		1
165	C55881	...TUBE LEVEL		1
166	88022-6-1	...GASKET		1
167	C55870	...PISTON		1
168	C55872	...WASHER		1
169	C55871	...HOLDER PACKING		1
170	GA13Z	...GASKET		2
171	GE13Z	...GASKET		2
172	JE27Z	...GASKET		2
173	C55872	...WASHER		1
174	C55873	...BUSH THREADED		1
175	23310AA015012LE	...PIN SPLIT (V-F0110)		1
176	C56385	...TUBE LEVEL		1
177	JEE7Z	...GASKET		1
178	C56386	...NUT		1
179	C56387	...LOCK WASHER		1
180	SI58Z	..GASKET		2
181	SA58Z	..GASKET		2
182	JE58Z	..GASKET		1
183	C55511	..PIN		1
184	C55513	..BUSH		1
185	C55512	..WASHER		2
186	23310AA020030LE	..PIN SPLIT (V-F0110)		2
187	23320CA063	..WIRE STAINLESS STEEL DO-63 (V-F0111)		AR

- Item not illustrated



Rear undercarriage legs
Figure 1105

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1105 188	831-63-000A	..VALVE (V-F0237)		2
189	831-63-800	...PACKING PREFORMED (V-F0237)		1
-190	831-63-600A	...VALVE (V-F0237)		1
191	831-63-901A	...PLUG (V-F0237)		1
192	C56420	..PIN		1
193	C56419	..PLATE		1
194	L22209-60-12BCL	..SCREW (V-F0111)		2
195	23320CA063	..LOCKWIRE STAINLESS STEEL DO-63 (V-F0111)		AR
-196	GA54412-1	..COVER ASSEMBLY		1
197	C55605	...COVER		1
198	C56421	...SPACER		1
199	C56418	...SPRING		1
200	C56422	...BOX		1
201	L22194-30-18CC	...SCREW (V-F0111)		2
202	22542K030	...NUT (V-F0111)		2
203	C56439-1	..PLATE		1
204	C55506	..PIN		1
205	C55505-1	..END PIECE		2
206	C55507	..END PIECE		2
207	23310AA030035LE	..PIN SPLIT (V-F0110)		2
208	C55716	..SHIM		2
209	A66767	..WASHER		2
210	22542K080	..NUT (V-F0111)		2
211	A66767	..WASHER		2
212	A1-66648	..SCREW		2
213	23320CA063	..LOCKWIRE STAINLESS DO-63 (V-F0111)		AR
-218	GA54214	..SOCKET ASSEMBLY		2
219	C55213	...SOCKET		1
220	C55214-1	...SHIM		2
221	6AJAL106	...NUT (V-F0224)		2
222	21215DE3210A	...RIVET (V-F0111)		4
223	JE38-5Z	..GASKET		2
224	C53950	..PLUG		2
225	BT21-3	..PACKING PREFORMED		2
226	C56107	..BLANK		2
227	BT23-1	..PACKING PREFORMED		2
228	C56109	..PIN		4
274	C61965	..STRIP LOCK		2
275	C61970	..BOLT		4
-230	GA54386	..DISCHARGER STATIC ASSEMBLY		1

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1105-188	831-63-000A	..VALVE (V-F0237)		2
189	831-63-800	...PACKING PREFORMED (V-F0237)		1
-190	831-63-600A	...VALVE (V-F0237)		1
191	831-63-901A	...PLUG (V-F0237)		1
192	C56420	..PIN		1
193	C56419	..PLATE		1
194	L22209-60-12BCL	..SCREW (V-F0111)		2
195	23320CA063	..LOCKWIRE STAINLESS STEEL DO-63 (V-F0111)		AR
-196	GA54412-1	..COVER ASSEMBLY		1
197	C55605	...COVER		1
198	C56421	...SPACER		1
199	C56418	...SPRING		1
200	C56422	...BOX		1
201	L22194-30-18CC	...SCREW (V-F0111)		2
202	22542K030	...NUT (V-F0111)		2
203	C56439-1	..PLATE		1
204	C55506	..PIN		1
205	C55505-1	..END PIECE		2
206	C55507	..END PIECE		2
207	23310AA030035LE	..PIN SPLIT		2
208	C55716	..SHIM		2
209	A66767	..WASHER		2
210	22542K080	..NUT (V-F0111)		2
211	A66767	..WASHER		2
212	A1-66648	..SCREW		2
213	23310CA063	..LOCKWIRE STAINLESS STEEL DO-63 (V-F0111)		AR
214	C44-51000-130	..STRIP BONDING		1
215	L22208-40-14BCL	..SCREW (V-F0111)		1
216	E27618E40AJTL	..WASHER (V-F0110)		2
217	22542K040	..NUT (V-F0111)		1
-218	GA54214	..SOCKET ASSEMBLY		2
219	C55213	...SOCKET		1
220	C55214-1	...SHIM		2
221	6AJAL106	...NUT (V-F0224)		2
222	21215DE3210A	...RIVET (V-F0111)		4
223	JE38-5Z	..GASKET		2
224	C53950	..PLUG		2
225	BT21-3	..PACKING PREFORMED		2
226	C56107	..BLANK		2
227	BT23-1	..PACKING PREFORMED		2
228	C56109	..PIN		4
229	C55212	..SCREW		4
-230	GA54386	..DISCHARGER STATIC ASSEMBLY		1

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1105 231	C55221	...DISCHARGER STATIC		1
232	CRN3-32BLEU	...SHEATH (V-06090)		2
233	L22193-80-8CC	..SCREW (V-F0111)		1
-236B	GA54243-10	.PIN ASEMBLY		1
-237B	C61967	..PIN		1
-238	GA54224	..BALL JOINT MATCHED		1
239	C49044	...HALF CAGE		1
240	2-98104	...BALL		1
241	C55223	...HALF CAGE		1
242	1-98106	..LOCK SLEEVE		1
243	4-98107	..NUT		1
244	C58456	..SCREW		1
245	L22542-60J	..NUT (V-F0111)		1
276	23134AA030020LE	..WASHER (V-F0111)		1
277	23310AA030025LE	..PIN SPLIT (V-F0110)		1
246	L22811-1	.NIPPLE GREASE (V-F0111)		1
247	E27618E40AJTL	.WASHER (V-F0110)		1
248	22542K040	.NUT (V-F0111)		1
-249B	GA54289	.HOSE ASSEMBLY	1BDFH	1
249D	6620180611	.HOSE ASSEMBLY POST SB 32-241	!K	1
-250	PR871-69406-1400	..HOSE	249B	1
-251	PR21-48266	..SLEEVE ITEM NUMBER	249B	3
-252	PR422-48302	..SLEEVE MARKING	249B	3
253	C22209	.CABLE ELECTRICAL		1
254	SST4H	.CLAMP (V-06383)		1
255	C31-53380	.PLATE		1
256	C32-53380	.PLATE		1
257	C33-53380	.PLATE		1
258	C1-52500	.TRANSFER		1
259	C50670-1	.PLATE		1
260	C51951	.PLATE		1
261	C9-53380	.PLATE		1
262	C16-53380	.PLATE		1
263	C17-53380	.PLATE		1
264	C54005	.PLATE		1
265	A1-46252	.DUST CAP		1
-266	70204	.CAP CONNECTOR (V-F0225) OR		
-266B	BP04	.CAP CONNECTOR (V-F1983)		1
-267	A46500	.LABEL STORAGE		1

- Item not illustrated

FIGURE ITEM	PART NUMBER	NOMENCLATURE 1234567	USAGE CODE	UNITS PER ASSY
1105 231	C55221	...DISCHARGER STATIC		1
232	CRN3-323LEU	...SHEATH (V-06090)		2
233	L22193-80-8CC	..SCREW (V-F0111)		1
234	C1-51081	..SCREW		1
235	L23111-60BCL	..WASHER (V-F0111)		1
-236A	GA54243-1	.PIN ASSEMBLY	1A	1
237A	C49043	..PIN	236A	1
-238	GA54224	..BALL JOINT MATCHED		1
239	C49044	...HALF CAGE		1
240	2-98104	...BALL		1
241	C55223	...HALF CAGE		1
242	1-98106	..LOCK SLEEVE		1
243	4-98107	..NUT		1
244	C58456	..SCREW		1
245	L22542-60J	..NUT (V-F0111)		1
246	L22811-1	.NIPPLE GREASE (V-F0111)		1
247	E27618E40AJTL	.WASHER (V-F0110)		1
248	22542K040	.NUT (V-F0111)		1
-249A	GA54289	.HOSE ASSEMBLY	1ACEG	1
249C	6620180611	.HOSE ASSEMBLY POST SB 32-241	1J	1
250	PR871-69406-1400	..HOSE	249A	1
251	PR21-48256	..SLEEVE ITEM NUMBER	249A	3
252	PR422-48302	..SLEEVE MARKING	249A	3
253	C22209	.CABLE ELECTRICAL		1
254	SST4H	.CLAMP (V-06383)		1
255	C31-53380	.PLATE		1
256	C32-53380	.PLATE		1
257	C33-53380	.PLATE		1
258	C1-52500	.TRANSFER		1
259	C50670-1	.PLATE		1
260	C51951	.PLATE		1
261	C9-53380	.PLATE		1
262	C16-53380	.PLATE		1
263	C17-53380	.PLATE		1
264	C54005	.PLATE		1
265	A1-46252	.CAP DUST		1
-266A	70204	.CAP CONNECTOR (V-F0225) OR		
	BP04	.CAP CONNECTOR (V-F1983)		1
-267	A46500	.LABEL STORAGE		1

- Item not illustrated

ILLUSTRATED REPAIR SIZE PARTS LIST

	FIGURE AND INDEX Nos	PART NUMBER	DESCRIPTION
	1101 (5 AB)	C49691R1 à R4	Bushing
	1101 (5 CD)	D54138R1 à R4	Bushing
	1101 (6 AB)	C55215R1 à R4	Bushing
	1103 (93)		
	1101 (6 CD)	D54139R1 à R4	Bushing
	1101 (7 AB)	GA54225R1 à R4	Bushing assembly
	1101 (7 CD)	D54535R1 à R4	Bushing
	1101 (13)	C55216R1 à R4	Bushing
	1103 (104)		
	1102 (40)	EbC54874	Ball
	1102 (39 AB)	C54873R1 à R5	Cage
	1102 (39CD)	C54873-1R1 à R5	Cage
	1103 (94)	C55225R1 à R5	Bush
	1103 (96)	A1-66449R1 à R4	Bush
	1104 (131)	C1-50588R1 à R5	Piston
	1104 (143)	C55630R1 à R5	Piston
	1104 (167)	C55870R1 à R5	Piston
	1104 (164)	C54857R1 à R5	Bottom base
	1103 (95)	C55204Eb	Axle
	1103 (117)	C55224R1 à R5	Pin
	1103 (101)	EbC55217	Pin
	1101 (31 AB)	C55206R1 à R4	Cage
	1101 (31 CD)	C55206-1R1 à R4	Cage
	*1101 (278 CD)	D54229-1EB	Bushing
	401 (A-1)	B90100H8-230EB	Bush
R	401 (A-2)	B80100H8-230EB	Bush
	401 (A-1)	B90110H8-120EB	Bush
R	401 (A-2)	B80110H8-230EB	Bush
	403 (A-1)	D52315-36EB	Bush
	403 (A-2)	D52315-211EB	Bush
	403 (A-3)	D52315-30EB	Bush
R	407 (A-1)	D52615-43	Liner

NOTE : The existence of R1 to Rn after the manufacturer's Part Number indicates that there are "n" parts to repair dimensions, which must be ordered by adding after that Part Number the index for the repair dimension required (R1 or R2... Rn). Example : C50360R1

* This bush meets the requirements for repair of magnesium alloy barrels and aluminium alloy barrels.

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