



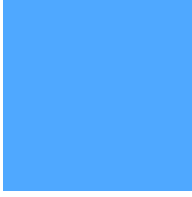
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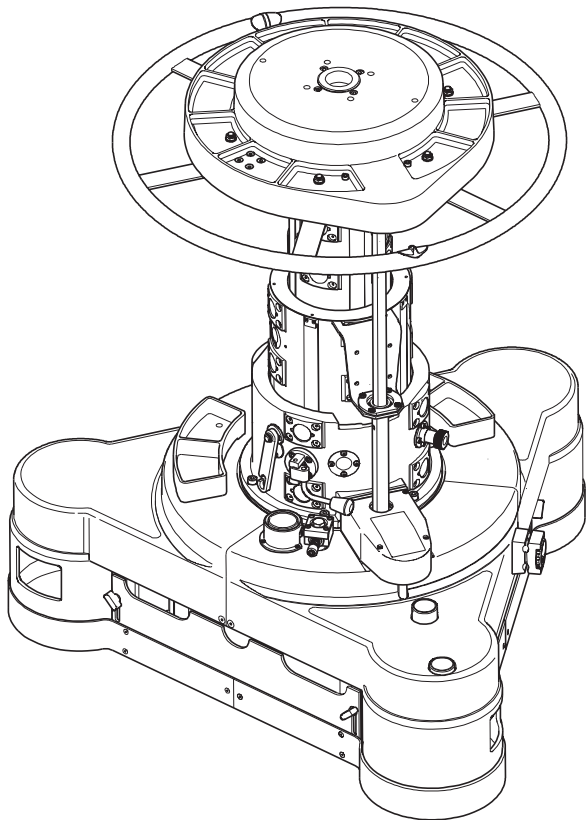
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Maintenance Manual

Fulmar



Pedestal



Fulmar

PEDESTAL 3702

MAINTENANCE MANUAL AND ILLUSTRATED PARTS LIST

PUBLICATION PART No. 3702-9

ISSUE 14

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Foreword

This manual provides full and detailed maintenance and spare parts information for the Vinten® Fulmar pedestal. The Fulmar pedestal is an obsolete product and this Maintenance Manual is provide for the final production version.



WARNING! Read the Safety Section on [page 5](#) before using this pedestal or attempting any adjustment or repair.

It is recommended that this manual is read carefully and the illustrations studied prior to operating or servicing the pedestal. Attention to the details contained herein will ensure that the pedestal will operate efficiently with the minimum of attention over a long service life. Particular attention must be paid to cleaning, especially after use in adverse conditions.

To order spare parts or to obtain further information, application should be made to Vinten Broadcast Limited or to your local distributor, or visit our website at www.vinten.com.





Notes to readers

This is an on-line version of 'Fulmar Pedestal Maintenance Manual' (3702-9). The Fulmar pedestal is an obsolete product and this Maintenance Manual is provide for the final production version.

Navigation

Clicking the mouse on any [blue text](#) will move you around the document. For example, if you click on one of the blue call-outs on an exploded drawing, you will be taken to the appropriate line in the relevant parts list.

[Contents](#) Clicking here will take you to the Contents Page.

-  Clicking here will take you to the first page.
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Alternatively, you may use the Acrobat Reader navigation buttons.

Safety - Read This First!

Warning symbols in this maintenance manual



Where there is a risk of personal injury, injury to others, or damage to the pedestal or associated equipment, comments appear, highlighted by the word **WARNING!** and supported by the warning triangle symbol.

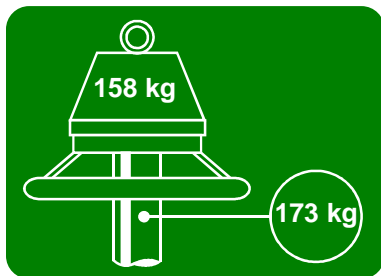
Warning symbols on the pedestal



On encountering the warning triangle and open book symbols it is imperative that you consult this maintenance manual before using this pedestal or attempting any adjustment or repair.

Critical data

Mass

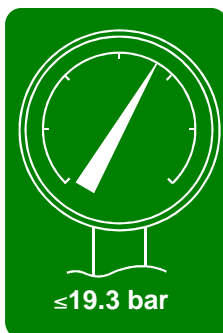


Pedestal	173 kg	(383 lb)
Trim weights (total)	7.5 kg	(16.5 lb)

Load

Minimum Load	23 kg	(50 lb)
Maximum Load	158 kg	(350 lb)

Pressure



Maximum pressure	19.3 bar	(280 psi)
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Abbreviations

The following abbreviations are used in this publication:

ac	alternating current	lb	pound (weight)
A	Amps	LF	Lubricated Friction
AF	across flats	LH	left hand
A/R	as required	MISO	metric thread
ASME	American Society of Mech Engineers	m	metre
assy	assembly	mm	millimetre
BS	British Standard	N	Newton
BA	British Association thread	NPT	National Pipe thread
BSF	British Standard Fine thread	NI	not illustrated
BSP	British Standard Parallel Pipe thread	No.	number
BSW	British Standard Whitworth thread	OD	outside diameter
btn	button	PCB	printed circuit board
chs	cheese	PCD	pitch circle diameter
C of G	centre of gravity	pozi	Pozidriv
comp	compression	psi	pounds per square inch
csk	countersunk	pt	point
cu	cubic	PTFE	Polytetrafluoroethylene
c/w	complete with	PVC	Polyvinyl chloride
dc	direct current	RH	right hand
dia	diameter	sect	section
ft	foot	skt	socket
hd	head	SWG	standard wire gauge
hex	hexagon	thk	thick
Hz	Hertz (frequency)	UNC	Unified Coarse thread
IC	integrated circuit	UNF	Unified Fine thread
ID	inside diameter	V	Volts
in.	inch	W	Watts
kg	kilogram		

Technical Specification

NOTE: The drawings in this section are provided only as a guide to construction and material in the pressurized parts of the pedestal. They should NOT be used for dismantling and assembly or the ordering of spare parts. Please refer to [Section 5 - Repair](#) or [Section 6 - Illustrated Parts List](#).

Weight 173 kg (383 lb)

Overall Dimensions

Maximum height 149.5 cm (59 in.)

On-shot stroke 77 cm (30 in.)

Doorway width

Minimum 86.5 cm (34 in.)

Maximum 99 cm (39 in.)

Payload

Minimum 23 kg (50 lb)

Maximum 158 kg (350 lb)

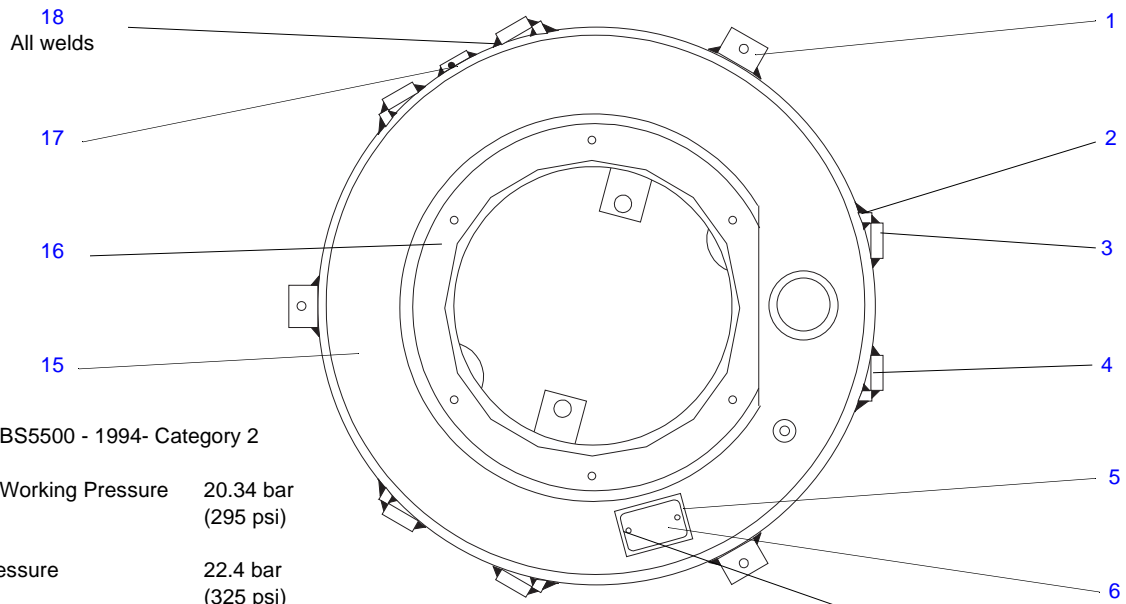
Pneumatic system

Maximum Working Pressure 20.34 bar (295 psi)

Design Pressure 22.4 bar (325 psi)

Test Pressure 27.99 bar (406 psi)

Pressure Tank Assembly (Part No. 3702-42)



Standard: BS5500 - 1994- Category 2

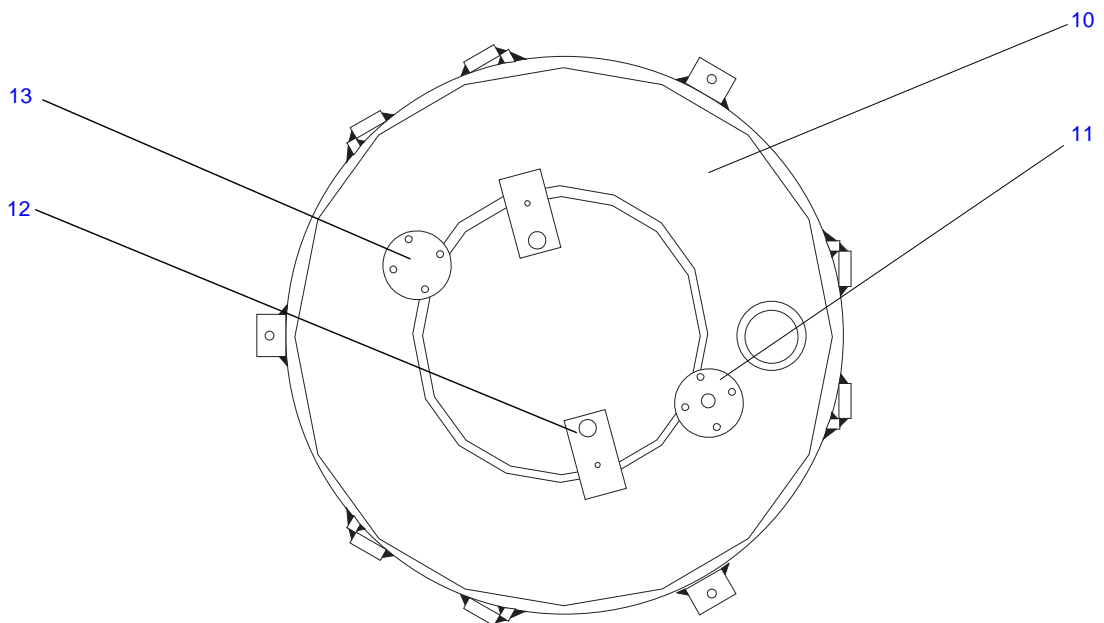
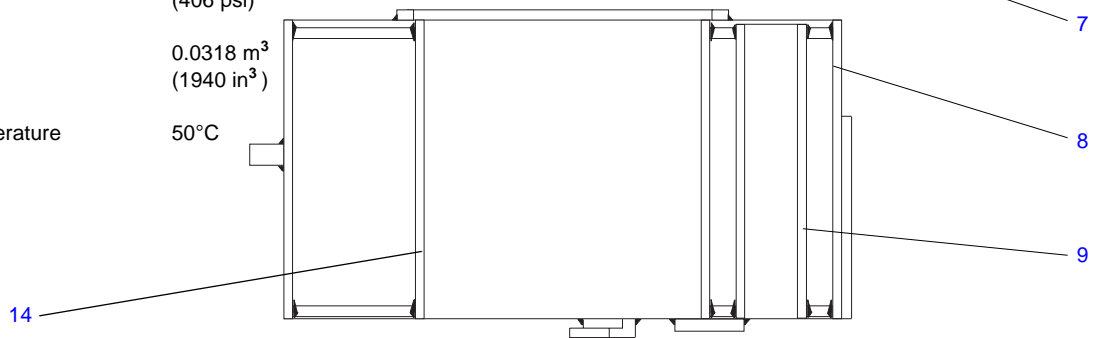
Maximum Working Pressure 20.34 bar (295 psi)

Design Pressure 22.4 bar (325 psi)

Test Pressure 27.99 bar (406 psi)

Volume 0.0318 m³ (1940 in³)

Design Temperature 50°C

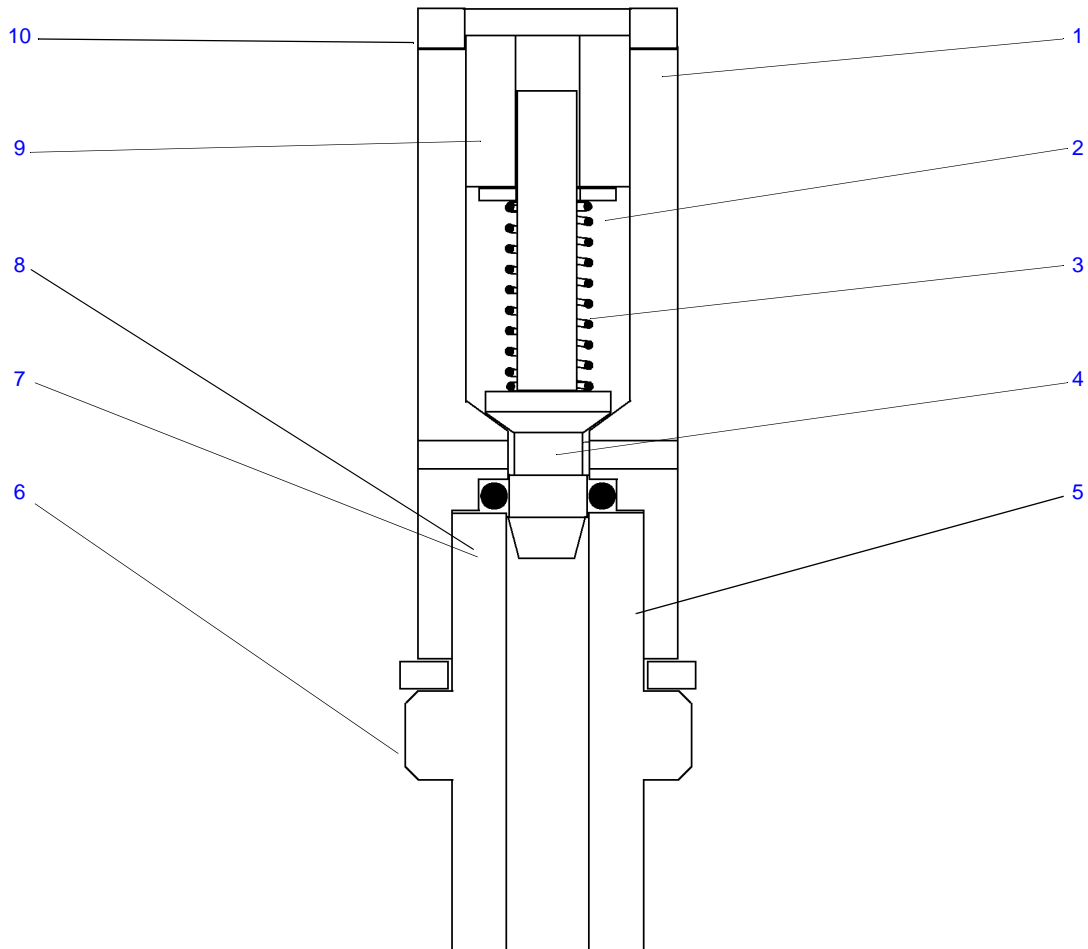


Pressure Tank Assembly (Part No. 3702-42)

Item	Name	Qty	Material
1	Pad	3	Mild steel to BS970 non-lead bearing
2	Packing strip	6	Mild steel to BS970 non-lead bearing
3	Leg mounting (RH)	3	Mild steel to BS970 non-lead bearing
4	Leg mounting (LH)	3	Mild steel to BS970 non-lead bearing
5	Mounting block	1	Mild steel to BS970 non-lead bearing
6	Nameplate	1	22 SWG Aluminium sheet
7	Hammerdrive screw	2	Type U hardened, 00 x 1/8 in.
8	Outer shell	1	20 in. OD x 1/4 in. thick mild steel plate to BS1501-151 GR403A *
9	Tube	1	2 3/8 in. OD x 3/16 in. wall steel tube to BS1501-HFS S360 *
10	End plate (lower)	1	19 7/16 in. x 1/2 in. thick mild steel plate to BS1501-151 GR403A *
11	Pad	1	Mild steel to BS970 non-lead bearing
12	Anchor plate	2	Mild steel to BS970 non-lead bearing
13	Pad	1	Mild steel to BS970 non-lead bearing
14	Inner shell	1	10 3/4 in. OD x 1/4 in. wall steel tube to BS1501-HFS S360 *
15	End plate (upper)	1	19 7/16 in. x 1/2 in. thick mild steel plate to BS1501-151 GR403A *
16	Flange	1	Mild steel to BS970 non-lead bearing
17	Relief valve mounting insert	1	Mild steel to BS970 non-lead bearing
18	Welding wire	A/R	1.0 mm mild steel BS2901 Part 1:1983A18 *

*Material fully certified and covered by mechanical and chemical certificates

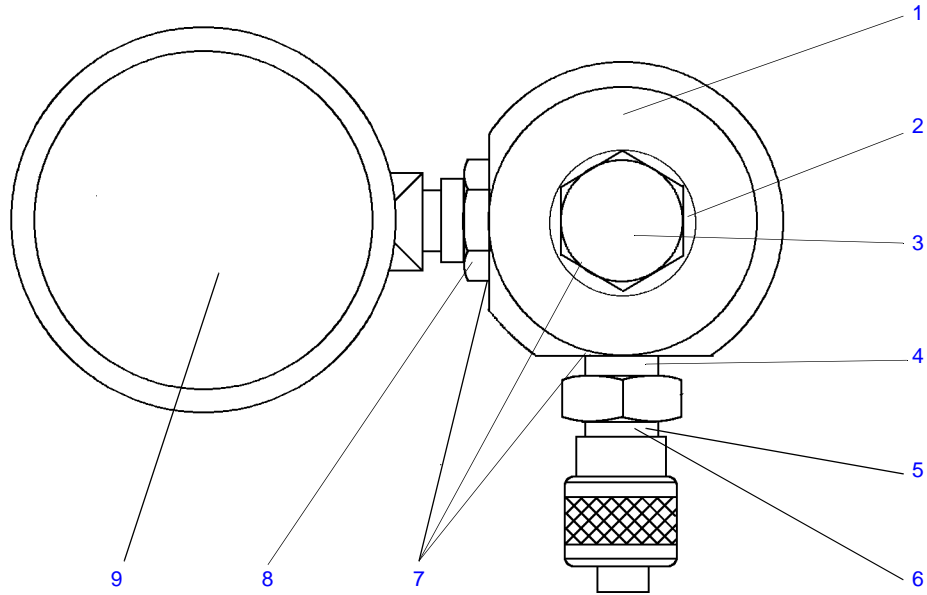
Safety Valve Assembly (Part No. 3702-26)



Relief Valve Assembly (Part No. 3374-13)

Item	Name	Qty	Material
1	Body	1	Brass, BS2874 CZ121 Pb4
2	Small washer	1	2BA
3	Spring	1	Flexo Ref 143306
4	Spool	1	Stainless steel EN56AM
5	Spigot	1	Stainless steel EN56AM
6	Bonded seal	1	1/4 in. BSP, Dowty Ref PP-45-B
7	'O' ring	1	Gaco Ref R2025
8	Silicone grease	A/R	MS4
9	Adjuster	1	Stainless steel EN58
10	Locking nut	1	Brass, BS2874 CZ121 Pb4

Pressure Gauge Assembly (Part No. 3702-33)
Pressure Gauge Assembly (USA) (Part No. 3054-11)



Pressure Gauge Assembly (Part No. 3702-33)
Pressure Gauge Assembly (USA) (Part No. 3054-11)

Item	Name	Qty	Material
1	Banjo	1	Aluminium alloy HE 30 TF
2	Bonded seal	2	1/4 in. BSP, Dowty Ref PP-45-B
3	Banjo bolt	1	Mild steel BS970 EN1A
4	Bonded seal	1	2BA, Dowty Ref PP-45-3
5	Charging valve	1	Modified Part No. J005-020 - Schrader valve No. 9886
5	Charging valve (USA only)	1	Modified Part No. J005-021 - Schrader tank valve No. 8911
6	Valve core	1	Schrader valve core No. 230011
7	Hydraulic sealant	A/R	Loctite 542
8	Adaptor nut	A/R	Brass
9	Pressure gauge	1	Wika 0-400 psi (0-27 bar) 2 in. dia



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Design Improvements

Details	Serial No. Information

Section 1

Introduction and Description

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Introduction

1 The Vinten Fulmar pedestal (Fig 1.1) is capable of supporting and counterbalancing a payload weighing between 22.68 kg (50 lb) and 158 kg (350 lb), which provides it with adequate capacity for the majority of cameras, camera mountings, prompters and other accessories.

2 The pedestal has a fully counterbalanced, nitrogen-charged column which may be raised and lowered under hand control. Pedestal motion about the studio is controlled by the cameraman who directs the movement with the steering ring. A foot-operated changeover mechanism allows selection of crab or steer modes of movement.

Description

General

3 The major assemblies of the Fulmar pedestal are the telescopic column and the base.

4 The telescopic column is located in a fixed tube secured to the base assembly, and consists of a three-stage extension unit and a two-stage ram. The ram is pressurised by nitrogen stored in a tubular tank and this tank forms the main structure of the base.

5 The pressure of the nitrogen in the ram balances the weight of the moving parts of the pedestal column plus the payload (i.e. the camera and any accessories). When lowering or raising the load the effort applied to the column by the cameraman needs only to overcome the friction of the moving parts and the drag preset by the variable friction control. The column sections are linked internally by cords and chains running over pulleys and sprockets. This system ensures that all three sections extend or retract to the same extent.

6 To balance differing payloads, the nitrogen pressure is either increased or decreased as required. Fine adjustment of the column balance is by means of trim weights (1) which are placed in a circular tray (3) above the steering ring (16). Two storage trays (15) are fitted to the base to hold trim weights which are not in use.

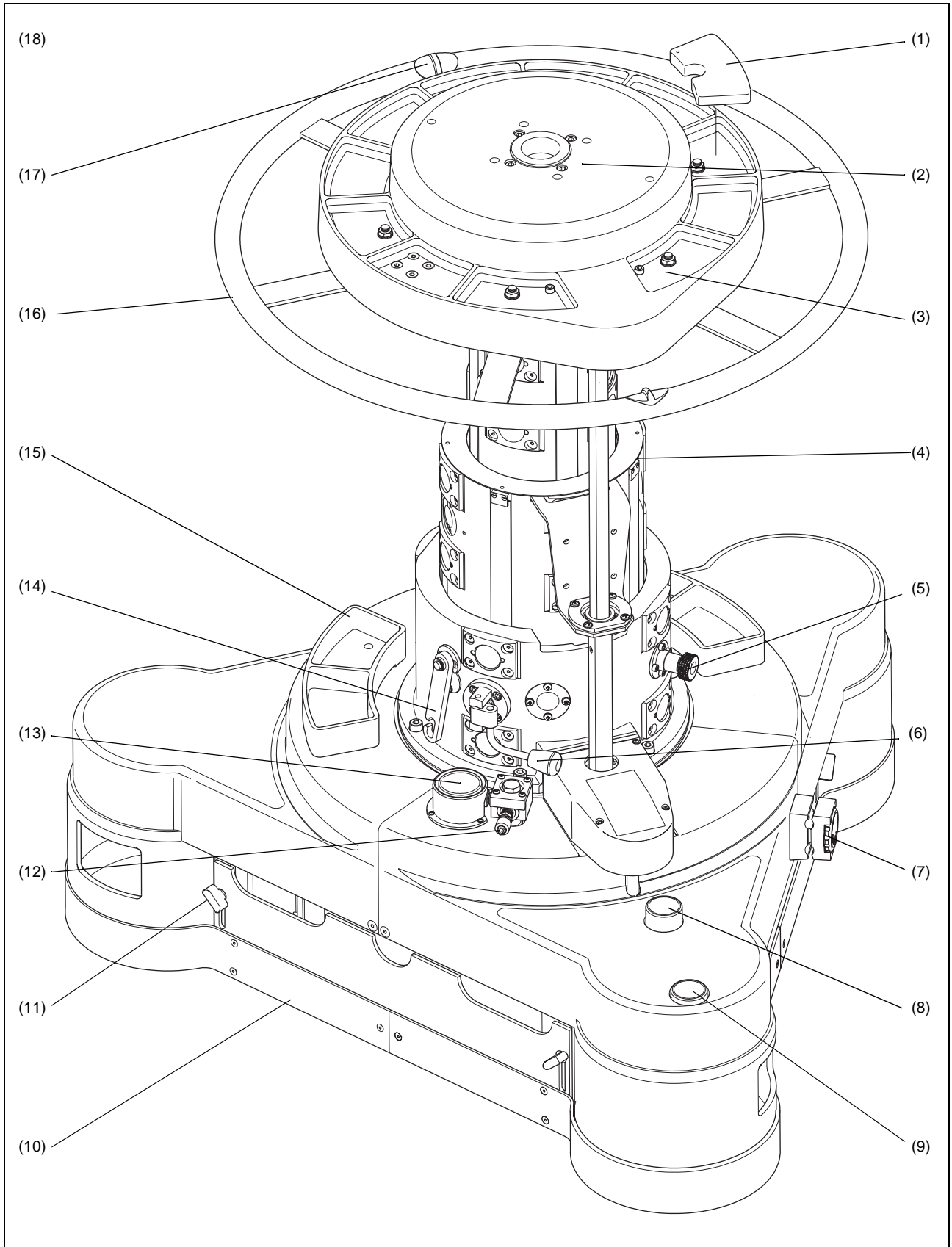


Fig 1.1 Fulmar pedestal

7 The pedestal can be easily manoeuvred around the studio. The steering ring (16) is used to turn the pedestal wheels and the steering mechanism provides two modes of operation - crab, where all three wheels turn together, and steer, where two wheels are locked in the straight-ahead position and the third wheel steers independently.

8 The main assemblies of the pedestal are described in more detail below.

Base

9 The base consists of a robust tubular steel fabrication which forms the nitrogen storage tank and is the frame on which the pedestal is built. On the upper face of the tank there is a machined and tapped flange which provides the mounting face for the fixed tube and on the outer shell are three pairs of equally spaced mountings to which the wheel assemblies are attached.

10 Each wheel unit consists of an alloy housing supporting a twin-wheel axle assembly. The wheel pivot is supported in a pair of ballraces and the upper end of the pivot shaft terminates in a sprocket assembly for the steering mechanism which links all the wheels together by an endless chain. The wheels are rotatable through 360 degrees by means of the steering ring and both the crab and steer modes of movement are controlled by the steering ring, with changeover effected by foot-operated buttons mounted on the base.

11 The wheels are of cast alloy running on ballraces and each is fitted with a low friction, squeal-free tyre.

12 The base unit components are enclosed by contoured covers and side plates. Optional lifting handles may be installed on the covers.

13 A continuous cable guard (10) surrounds the base and is adjustable for height.

Column

14 The three-stage column (4) is located in a fixed tube secured to the welded pressure tank and consists of three concentric column sections and a two-stage ram.

15 The fixed tube is a static unit bolted rigidly to the base. Four pairs of roller bearings are dispersed around this section at 90 degree intervals, with each pair arranged one at the top and one at the bottom of the column. Two pairs of the bearings are fixed and two pairs are adjustable. The adjustable bearings differ from the fixed units in that they have an eccentric shaft with an adjuster, a clamping arrangement on the bearing housing and a screw to close the clamping arrangement onto the eccentric shaft.

16 The adjustable roller bearings are positioned diametrically opposite the fixed roller bearings and are used to take up any clearance across their individual planes of support thus eliminating any sideplay in the column. The outer and centre tubes of the telescopic column are fitted with the same arrangement.

17 The tubes of the column are linked together by a system of chains and sprockets and cords and pulleys which ensure that, during extension and retraction, the telescopic action is equally distributed between the moving sections. All three stages have hardened steel bearing tracks on the outer surfaces, which correspond with the roller bearings on the inner face of the next lower stage to form the motion guides.

18 The balancing force for the column is provided by a two-stage ram. The movements of the ram stages in relation to each other are controlled by the movements of the outer and middle stages of the column. The ram is connected to the pressure tank via a manifold.

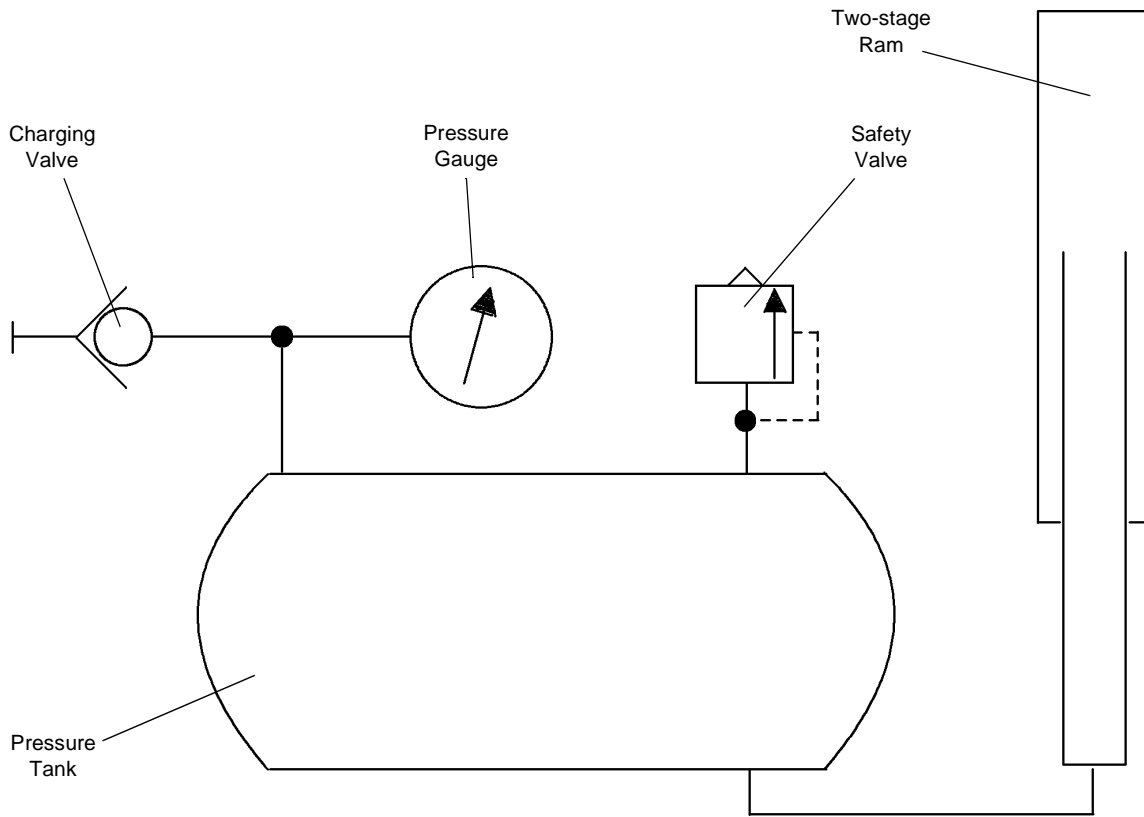


Fig 1.2 Pneumatic system - schematic diagram

Head Mounting Platform

19 The platform consists of a contoured alloy casting attached to the upper stage of the telescopic column. On the top of the platform provision is made for mounting a pan and tilt head (2). On the underside of the platform there are six eccentric shafts carrying nylon rollers which locate the steering ring around the column. The steering mechanism upper section is also fitted to the underside of the head mounting platform as are the brackets and spigots of the locking bar assembly together with the rubber stops.

Pneumatic System

20 The pneumatic system (Fig 1.2) consists of the pressure tank, the manifold and the two-stage ram. A Schrader-type charging valve and pressure gauge are connected to the top face of the pressure tank by a banjo assembly. A safety valve is screwed into a boss in the side of the tank.

Section 2

Operation

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Putting into service	2

General

1 To identify components, please refer to [Fig 1.1](#). For further operating instructions, please refer to Fulmar Pedestal Operators Guide, Publication Part No. 3702-8.

Putting into service

Unpacking

2 Unpack the pedestal, ensuring that all transport packing and retaining fixings are removed, in particular the white plastic collar under the weight tray.



WARNING!: Do not attempt to unlock the platform locking bars until the pedestal load has been fitted.

3 Ensure that both platform locking bars (14) are retaining the platform in its lowest position.

Steering mechanism checks

4 There are two foot buttons on the pedestal, one marked CRAB (9) and one marked STEER (8). Bring one of the red indicators (17) on the steering wheel in line with the datum line on the weight tray (3), press the CRAB button and turn the steering wheel. Check that all three wheels turn together and all point in the same direction. Now realign the red indicator, press the STEER button and turn the steering wheel. Check that two of the wheels lock into the straight-ahead position and that the third wheel can still be turned with the steering ring.

Attachment of pan and tilt heads

5 The following paragraphs provide the necessary information for mounting Vinten and other pan and tilt heads. However, the head should not be fitted to the pedestal until the appropriate point in the charging procedure is reached (Para 9).

Vinten pan and tilt heads

6 Any type of Vinten head, including remotely operated types, may be fitted to the Fulmar pedestal. Fitting is carried out by placing the head in position, locating the four holes and fitting the four bolts provided.

Pan and tilt heads using Mitchell-type centre-screw fixing

7 To fit heads using the Mitchell-type centre-screw fixing, it is necessary to fit a stand-off adaptor, Vinten Part No. 3710-3.

8 The adaptor is fixed with the standard four-bolt fixing and enables the centre screw to be secured. Vinten heads can be fitted by means of a centre screw if this is preferred.

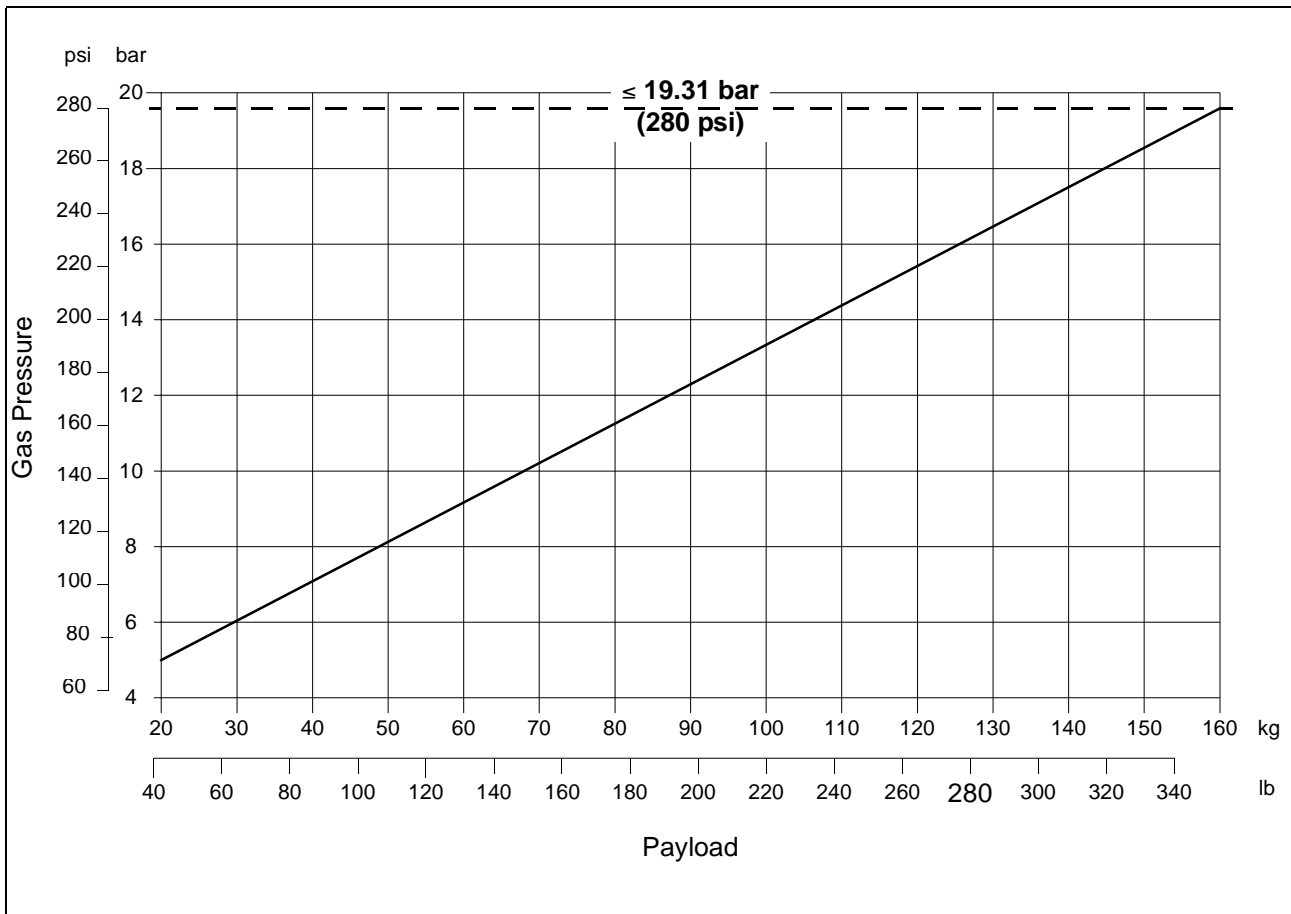


Fig 2.1 Pressurization graph

Nitrogen charging procedure



WARNING!: A pressure reducing valve must be fitted to the pressure line between the nitrogen cylinder and the outlet connection of the hose. The reducing valve must be screwed into the nitrogen cylinder outlet. the maximum pressure on the outlet side of the reducing valve when charging this pedestal must not exceed 19.31 bar (280 psi).

9 Charge the pedestal with nitrogen as follows:-

9.1 Connect nitrogen supply to the charging valve (12) on the pedestal, ensuring that the conditions of the above caution are observed. A recommended charging kit for this pedestal is the charging valve assembly, Vinten Part No. 3702-32. Note that this piece of equipment is NOT a pressure reducing valve.

9.2 Ascertain known payload to be fitted to pedestal (known payload = pan and tilt head, camera, lens and all ancillary equipment). Referring to the graph (Fig 2.1), mark the payload on the horizontal axis then strike a vertical line from the load figure to the balance line. At the intersecting point strike a horizontal line to the vertical axis of the graph and read off the gas pressure. Charge the pedestal gas tank to this pressure.

- 9.3 Fit the pan and tilt head to the platform then fit the camera and accessories. A cable clamp (7) is provided on the pedestal base for camera cables.
- 9.4 Add four of the large trim weights (1) to the weight tray (3) in the platform.
- 9.5 Set the column brake (6) to OFF and turn the column friction adjuster (5) to minimum.
- 9.6 Using firm hand pressure raise and lower the steering ring to check that the pedestal balance is approximately correct. As the locking bars (14) are still engaged the steering ring can only be moved up and/or down about 20 mm (3/4 in.) but this is sufficient to check that the balance is approximately correct. Only a small amount of effort should be needed to move the column. If it rises when released, the pressure is too high and if it falls the pressure is too low. If the pressure is incorrect, slowly add or release nitrogen as required until balance is achieved.
- 9.7 When balance is correct, depress the steering ring and disengage both platform locking bars (14). Gently lift the steering ring. The camera platform should rise. Exercise platform over its full height range at least twice. With platform at its highest position ensure there is no tendency for it to sink, then move platform to mid-position and release. If platform tends to sink, increase nitrogen pressure.
- 9.8 Remove charging equipment and fit blanking cap to charging valve.
- 9.9 The column brake (6) on the fixed section of the column is designed only to hold the column at a set height during camera operation.

Column locking

10 The column can be locked in its lowest position (whether counterbalanced or not) by means of the two locking bars (14). This facility should be used whenever a load is being fitted, or when the pedestal is not in use. The locking bars are attached to the fixed column and both bars can easily be secured by swinging them upwards to the fixing points on the underside of the inner steering ring.

Operation

Balancing

11 Temperature changes may affect the balance of the pedestal column. These effects can be neutralized by adding, or removing, trim weights (1).

Manoeuvring the pedestal.

12 The pedestal is steered by means of the steering ring (16) which always maintains the same position in relation to the head mounting platform irrespective of column height. When the pedestal is in crab mode, all three wheel units are locked together; the direction of track being indicated by the red indicators (17) fitted to the steering ring. When the pedestal is in the steer mode two wheels are locked in the straight-ahead position and one wheel provides conventional steering. To change steering mode align one of the red indicators on the steering ring with the datum line on the weight tray (3) and depress the appropriate button.

Column brake

13 The column, when balanced, may be locked in any position by applying the friction brake (6). The brake is located on the fixed part of the column assembly and is operated by a small lever. The friction brake will not

support an out-of-balance load greater than 9.0 kg (20 lb). DO NOT use the friction brake to hold the column when fitting or removing equipment – ALWAYS engage the locking bars.

Friction control

14 The friction control (5) is located on the fixed part of the column assembly. Friction, or drag, may be applied to the movement of the column to suit the requirements of the operator. Adjustment is by turning the friction control knob, clockwise to increase friction, counter-clockwise to decrease friction.

Cable guard

15 A drop-down cable guard (10) is fitted to the pedestal base. The guard may be adjusted by slackening the six retaining thumbscrews (11), positioning the guard at the required height and then re-tightening the thumbscrews. The guard should be set as close as possible to the studio floor.

Section 3

Tools and Materials

Special tools

1 The following special tools are required for certain procedures detailed in Sections 4 and 5

Item	Part No.	Use
Charging valve assembly	3702-32	Nitrogen charging

Consumable materials

2 The following consumable materials are required for certain procedures detailed in Sections 4 and 5.

Item	Part No.	Use
Oil, Nycolube 11B	Z150-031	Bearing and general lubrication
Grease, GP50	Z150-081	Crab/steer changeover mechanism
Grease, Chesterton	Z150-105	Ram lubrication
Loctite 221	Z002-026	Steering change-over gear
Loctite 542	Z002-025	Pressure gauge assembly
Loctite Primer T	Z002-019	Primer for 542
Lubricant, chain	Z150-050	Steering chains
Soap solution	--	Leak testing

Section 4

Servicing

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Column Brake	15

General

1 The design of the pedestal and its robust construction ensure that the amount of maintenance required is minimal. Attention to the following points will ensure a long and useful life with minimum need for repair. Should servicing or repair involving disassembly be required, refer to [Section 5 - Repair](#).

Cleaning

2 During normal studio use, the only cleaning required should be a regular wipe over with a lint-free cloth. Dirt accumulated during storage or periods of disuse may be removed with a semi-stiff brush. Particular attention should be paid to the bearing tracks on the telescopic column.

NOTE: Do NOT use oil or grease on any exposed part of the telescopic column. This is unnecessary and traps dirt which acts as an abrasive. Use only detergent-based cleaners. Do NOT use solvent- or oil-based cleaners, abrasives or wire brushes to remove accumulations of dirt, as these damage the protective surfaces.

Servicing

Nitrogen charging

3 The pneumatic system of the pedestal is a closed circuit, and normally maintains a given pressure for a long period. However, the charge pressure may need to be varied for load changes in which case, the nitrogen charging procedure given in Section 2 must be followed.



WARNING! This pedestal must be charged only with clean dry air or nitrogen. A pressure reducing valve must be fitted to the pressure line between the nitrogen cylinder and the outlet connection of the hose. The reducing valve must be screwed into the nitrogen cylinder outlet. The maximum pressure on the outlet side of the reducing valve when charging this pedestal must not exceed 280psi (19.31bar).

Leak check

NOTE: It is recommended that this check is only carried out when it is apparent that a pressure loss has taken place. To carry out the check it is necessary that the column be at full extension.

- 4 Carry out the leak check as follows:
- 4.1 Place a suitable load (approximating to normal payload) on the head mounting platform, disengage the two platform locking bars and raise the column to its full extent.
 - 4.2 Remove load from head mounting platform.
 - 4.3 Lay the pedestal on its side so that the steering ring supports the column.
 - 4.4 Apply a soap and water solution to the manifold block, the area at the base of the ram, the safety valve and the charging valve. The appearance of bubbles indicates leaks.
 - 4.5 If leaks are apparent, consult [Section 5](#) for the appropriate remedial action.

Safety valve check.

- 5 It is suggested that this check be carried out at yearly intervals. Proceed as follows:
- 5.1 Fit nitrogen charging equipment (Part No. 3702-32) or similar to charging point and depressurize pedestal completely.
 - 5.2 Referring to [Fig 6.6](#), remove safety valve (2) and bonded seal (1) from tank. Remove nitrogen charging equipment from charging point.
 - 5.3 Connect nitrogen charging equipment to nitrogen supply ensuring that a suitable pressure reduction valve is fitted between the gas cylinder and the supply point ([Para 3](#)).
 - 5.4 Connect pressure relief valve to outlet side of charging equipment.
 - 5.5 Set pressure reduction valve to 280psi (19.31bar) and pressurize line, increasing pressure in steps of 5psi (0.34bar) until relief valve opens. The valve should operate at 308psi (21.24bar) However,

a tolerance of ± 0.42 bar (6 psi) is permitted, and provided that the valve opens between 20.82 bar and 21.65 bar (302 psi and 314 psi) it can be considered that it is functioning correctly.



WARNING!: If valve setting is not satisfactory renew the complete valve assembly. DO NOT, under any circumstances, attempt to adjust the valve.

5.6 Fit new, or refit correctly functioning safety valve to tank, using a new bonded seal (1). The bonded seal should be fitted onto the threaded portion of the valve. Torque tighten the safety valve to 20lbf ft.

5.7 Charge pedestal as described in [Section 2](#).

Chain tension.

6 Check the chain tension as follows ([Fig 4.1](#)):

6.1 Remove cable guard and covers.

6.2 Check the tension of the steering chain. This should be such that there is little or no deflection of the chain on the side opposite the adjuster. If unsatisfactory, adjust as [Para 10](#).

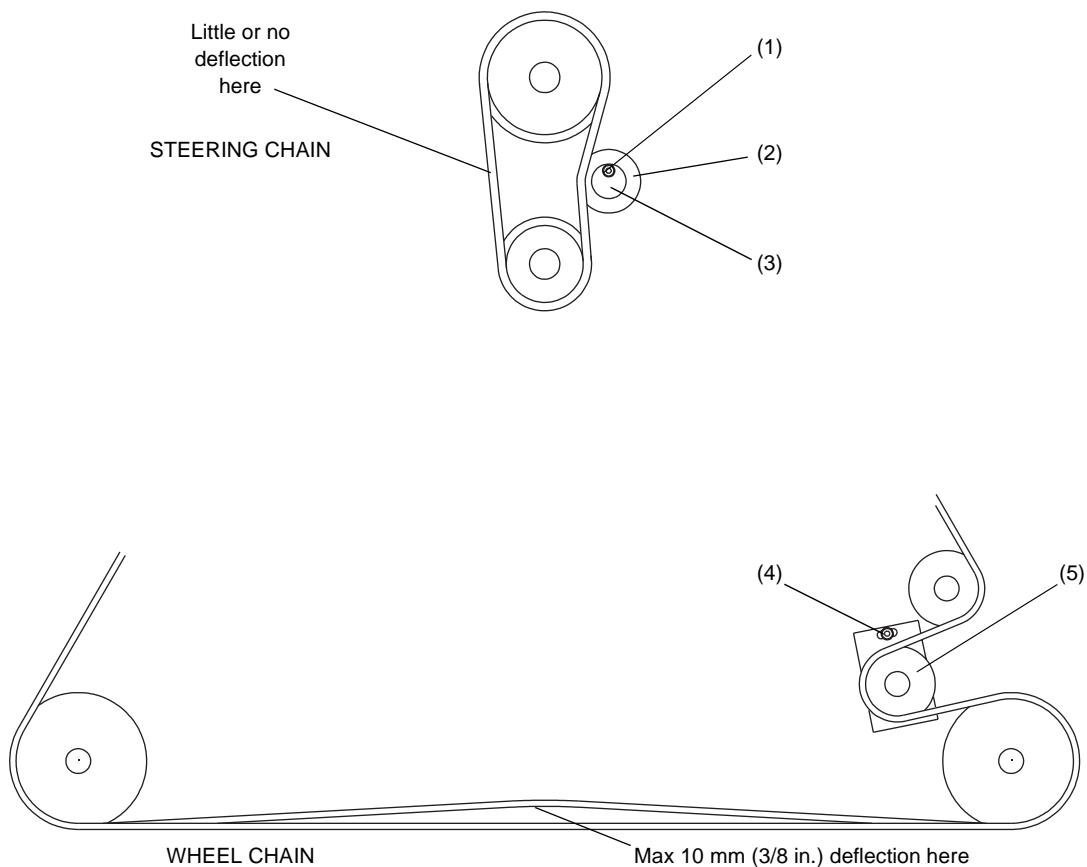


Fig 4.1 Chain tension adjustment

6.3 Check the tension of the wheel chain by selecting the greatest length of unsupported chain and measuring the amount of slack. This should not exceed 10 mm (3/8in.). If unsatisfactory, adjust as in [Para 11](#).

6.4 Refit cable guard and covers.

Wheel tracking

7 Adjustment of wheel tracking is usually necessary only if a chain has stretched or the chain tension has been adjusted. Check the wheel tracking as follows:

7.1 Mark a straight line 6 m (20 ft) long on the studio floor or use an existing line.

7.2 Set the pedestal steering to Crab mode and position the pedestal near one end of the floor line with two of the wheels just touching the line and aligned parallel with it.

7.3 Without turning the steering wheel, push the pedestal the whole length of the line and back again. Note the distance the wheels have run away from or onto the line.

7.4 If the wheels run more than 50 mm (2in.) off the line, the tracking requires adjustment ([Para 12](#)).

7.5 Repeat the test for the two remaining pairs of wheels.

Lubrication

Steering chains and bearings

8 Lubricate the steering chains and bearings as follows:

8.1 Remove cable guard and covers.

8.2 Clean chains.

8.3 Using a cloth impregnated with chain lubricant, wipe over complete run of each chain.

8.4 Apply Nycolube 11B oil direct to bearing at the lower end of the steering shaft.

8.5 Apply Nycolube 11B oil direct to bearing under head mounting platform.

8.6 Refit cable guard and covers.

Change-over gear

9 Lubricate the change-over gear as follows:

9.1 Remove cable guard and covers.

9.2 Apply GP50 grease to the pinions of the change-over gear.

9.3 Apply a few drops of Nycolube 11B oil to centre of the change-over spindle.

9.4 Refit cable guard and covers.

NOTE: The column bearing tracks do not require any lubricant.

Adjustments

Chain tensioning

10 To retension steering chain (Fig 4.1):

10.1 Slacken the shaft bolt (1) on the adjustable sprocket(2) and rotate the eccentric shaft (3) using a tommy bar, until little or no deflection of the chain is possible.

10.2 Retighten the bolt (1).

11 To retension wheel chain (Fig 4.1):

11.1 Slacken the bolt (4) under the adjustable sprocket (5) and reposition block until the slack on the longest free length is 10 mm (3/8in.).

11.2 Retighten the bolt (4).

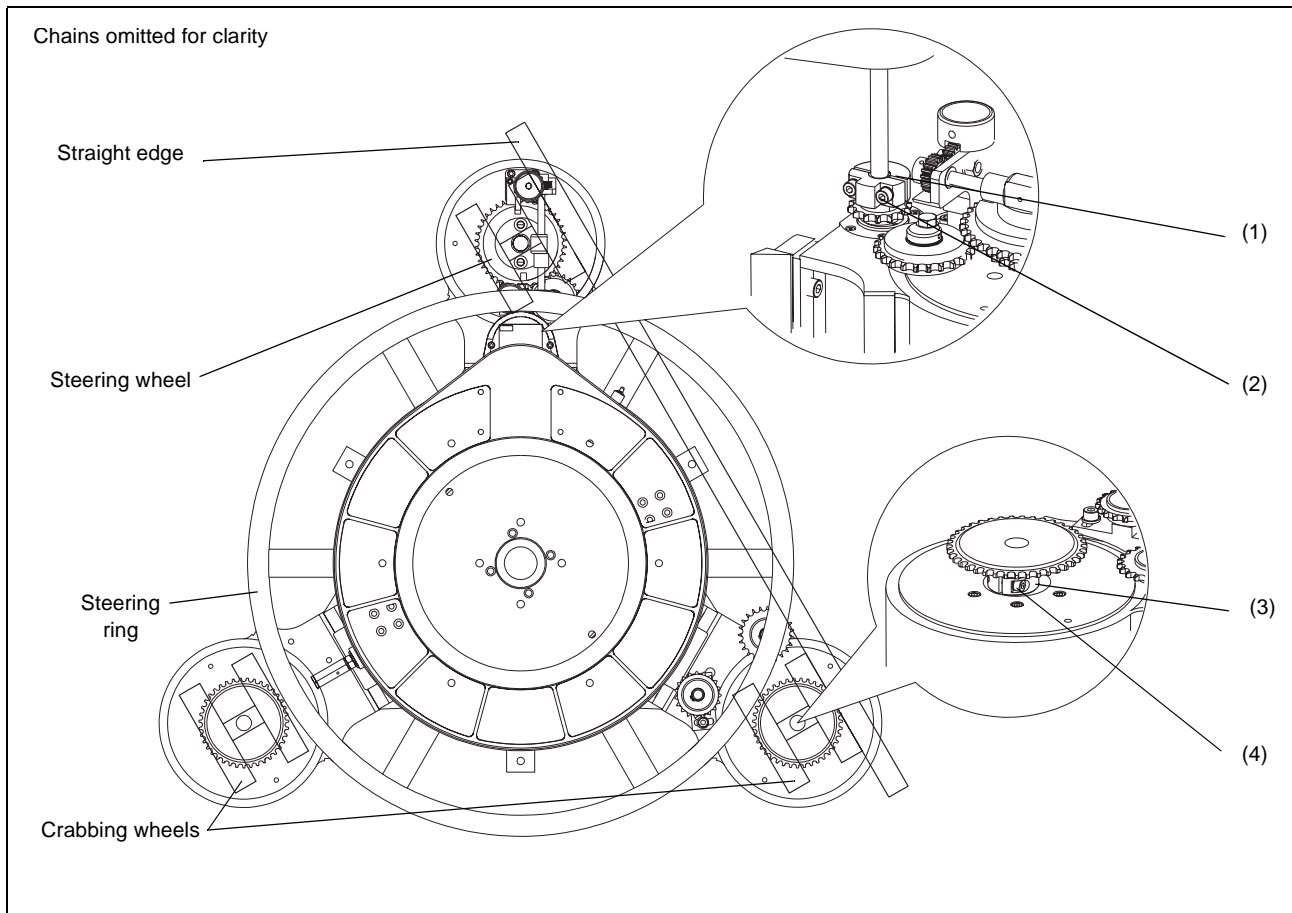


Fig 4.2 Wheel alignment

Wheel alignment

12 After steering chain tensioning it may be necessary to re-align the wheel assembly. The procedure is as follows (Fig 4.2):

12.1 Remove cable guard and covers.

12.2 Set change-over gear to CRAB

12.3 Ensure that, with indicator on steering ring aligned with mark on steering wheel assembly, the steering wheels are set straight ahead. If not, slacken socket screws (2) on clamp block (1), adjust as necessary and retighten clamp block screws (2).

12.4 Slacken the socket screw (4) on the clamp (3) on one of the pairs of crabbing wheels. Set a straight edge against the steering wheels and the crabbing wheels using the outer face of each pair as the datum. Turn the steering ring until the straight edge is flush along wheel faces of steering and crabbing wheels. Retighten clamp screw (4).

12.5 Repeat Para 12.4 for other pair of crabbing wheels.

12.6 Refit cable guard and covers.

Column guide roller adjustment

13 To adjust the column guide rollers, proceed as follows (Fig 4.3):

13.1 Remove any load from head mounting platform.

13.2 Using nitrogen charging equipment depressurize pedestal to 3.45 bar (50 psi).

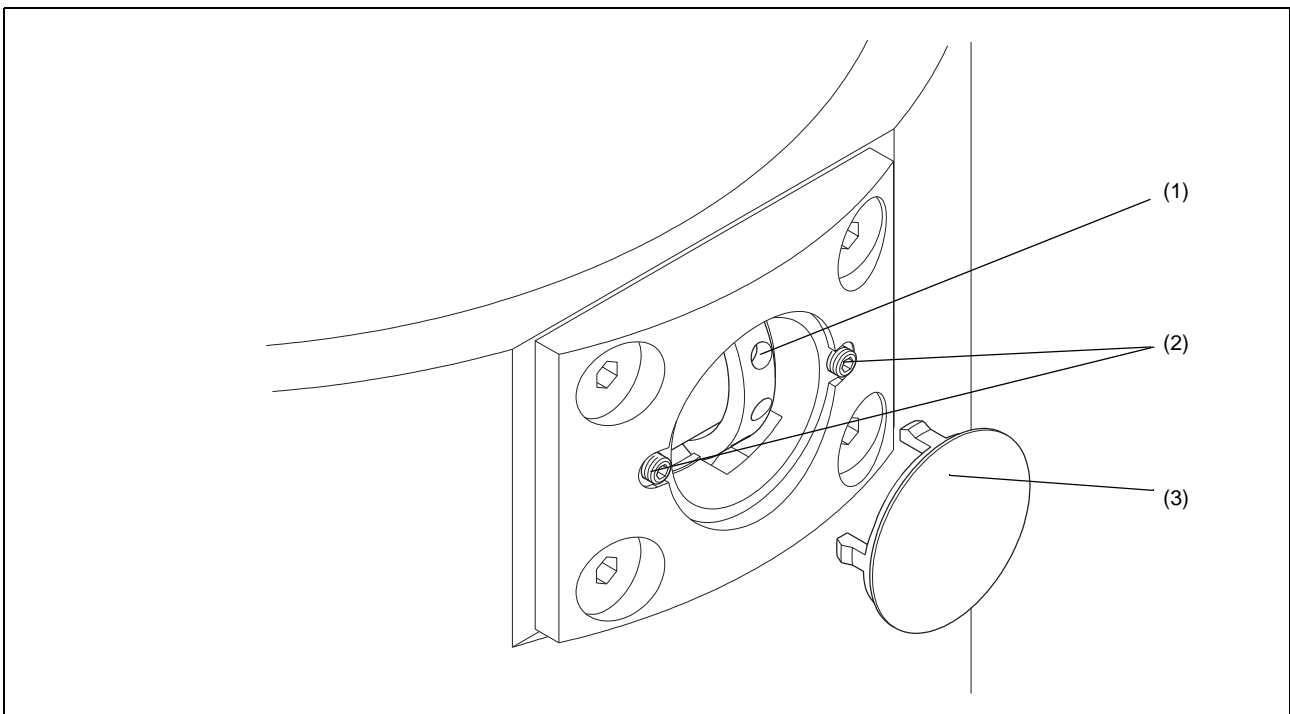


Fig 4.3 Column guide roller adjustment

- 13.3 Lower head mounting platform to a position that will just permit access to guide rollers.
- 13.4 At one of the pairs of adjustable guide rollers on the centre tube, remove the plugs (3) and slacken two grub screws (2) on both bearings.
- 13.5 Commencing with the lower of the pair of bearings, adjust each quadrant (1) using a torque wrench and a 50 mm (2 in.) tommy bar to a torque of 1.92N (17 lbf/in.).
- 13.6 Gently tighten both grub screws (2) until quadrant cannot be moved and refit plugs (3).
- 13.7 Repeat on adjacent bearing and on bottom and fixed tubes.
- 13.8 Upon completion of adjustment the column should move smoothly but without any free play between sections.
- 13.9 Charge pedestal (Section 2).

Steering ring adjustment

14 The adjustments necessary on the steering ring are limited to maintaining complete freedom of radial movement with all backlash eliminated and to maintain correct tension on the large steering belt, i.e. 6 to 8 lbs pull on outside of spokes. Adjust as follows (Fig 4.4):

- 14.1 On steering wheel assembly, slacken two locknuts (1).
- 14.2 Turn studs (2) with screwdriver until required position is reached.
- 14.3 Tighten locknuts (1).

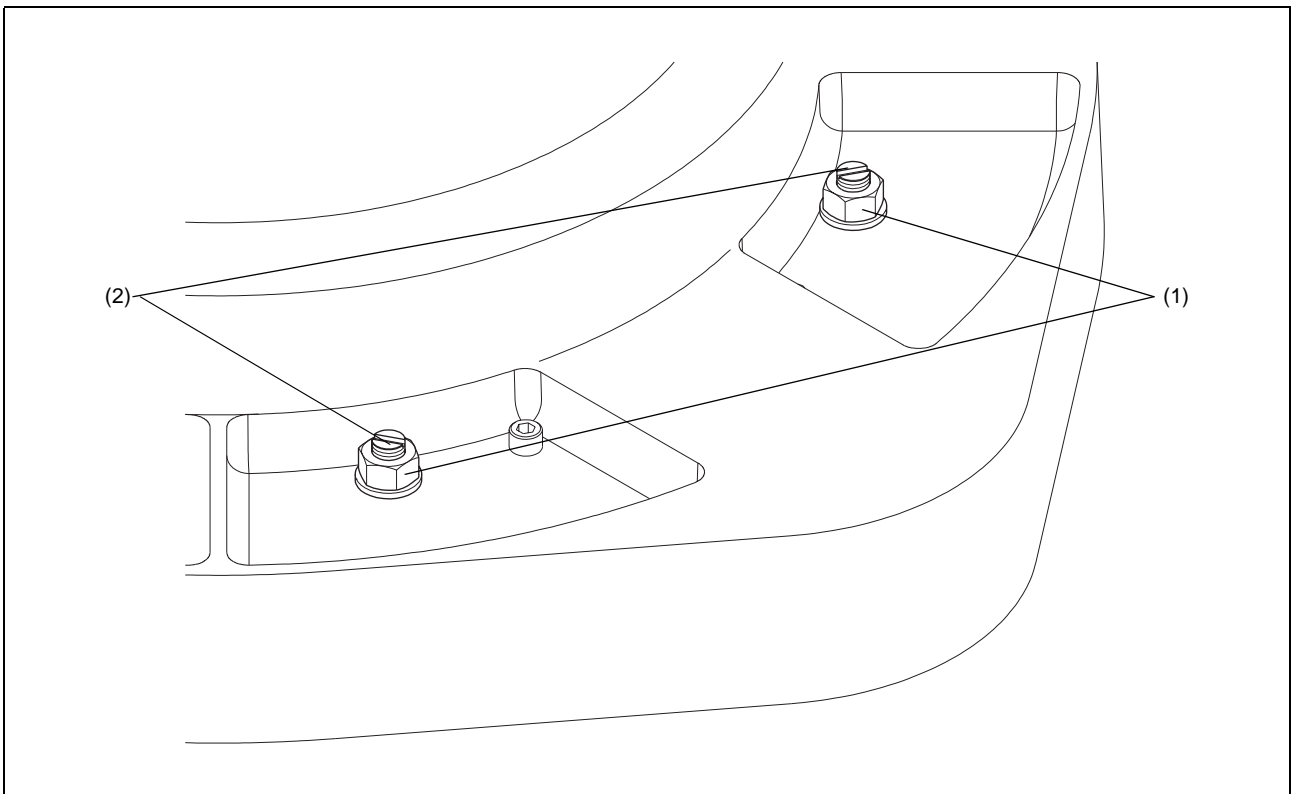


Fig 4.4 Steering ring adjustment

Column Brake

15 To compensate for wear on the brake pad ([Fig 6.5](#) item 27) turn the brake adjuster (33) counter-clockwise until the correct operation is obtained.

Section 5

Repair

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General

- 1 Repair and renewal of damaged items involves disassembling various assemblies and must be carried out in accordance with the following instructions. Any load must be removed from the pedestal before carrying out the following procedures.
2 Disassembly and assembly of the various components is carried out in conjunction with figures in Section 6 - Illustrated Parts List.



WARNING!: This pedestal is pressurized to a maximum of 19.31 bar (280 psi). Do not disassemble or interfere with any component in the pressure system without proper authority. Ensure all pressure is vented before disassembling any component in the pressure system.

NOTE: Certain consumable materials are required for procedures detailed in this Section. Please refer to Section 3 - Tools and Materials. For further details, please contact Vinten Broadcast Ltd or your local distributor.

Disassembly

Column bearings

3 Each column bearing is secured by four countersunk head socket screws. Ensure bearings are replaced in their correct position. To remove column bearings proceed as follows:

- 3.1 Extend column to maximum.
- 3.2 Remove load.
- 3.3 Connect nitrogen charging equipment to charging point and depressurize pedestal to 50psi (3.45bar).
- 3.4 Unscrew four countersunk socket screws securing each bearing and remove bearing assembly complete.
- 3.5 At this point, any defective part of the bearing assembly can be replaced, in particular the grub screws.
- 3.6 Lubricate bearing with 2 or 3 drops of Nycolube 11B oil through hole in centre of outer race.
- 3.7 Examine socket headed screws, in particular the hexagon socket. Discard any damaged items.

Steering assembly

4 To remove the steering assembly ([Fig 6.9](#)):

NOTE: All spring pins and circlips removed should be discarded and new items fitted.

- 4.1 Extend column to maximum.
- 4.2 Remove cover from change-over gear.
- 4.3 Remove pin (61) by gently tapping with a fine punch at one end, sufficiently to allow a pair of pliers to grip the opposite end, and withdraw and discard pin. Note the relative position of shaft and coupling and make suitable marks on both.
- 4.4 Ensure upper steering shaft is clear of coupling (1). Remove washer (2) from shaft.
- 4.5 Referring to [Fig 6.4](#), remove cover plate screws (16) and cover plate (15) from column. Remove two screws (23) securing tube bracket (34) to column.
- 4.6 Referring to [Fig 6.9](#), remove joining link (24) from steering chain (23) and disengage chain from sprocket.
- 4.7 Remove four screws (10) securing bracket cover (13).
- 4.8 Remove four screws (44) securing gear bracket (21) to fixed tube. Retain shims (45, 46) and lift bracket upwards until lower shaft is clear of bearing.
- 4.9 Remove complete assembly clear of pedestal.

Column and ram

5 To remove the column proceed as follows:

NOTE: It is not necessary to remove the column assembly from the pedestal or to dismantle the column for access to the ram assembly.

- 5.1 Remove any load from the head mounting platform.
- 5.2 Remove the steering assembly (Para 4).
- 5.3 Referring to Fig 6.8 remove four screws (6) and remove the weight tray assembly complete.
- 5.4 Connect nitrogen charging equipment to charging point and completely depressurize pedestal.
- 5.5 Lay the pedestal on its side.
- 5.6 Referring to Fig 6.6 slacken the four screws (10) at each end of the manifold (4) to allow the 'O' ring seal (8) to unseat and any residual pressure in the tank to exhaust. Remove screws (10) and washers (9).
- 5.7 Withdraw the first stage piston (5) and the manifold (4) together from the bore of the first stage cylinder.
- 5.8 Close the column to its lowest position.
- 5.9 Slacken two screws (17) and remove the cords (21) from cord clamps (19). Note the arrangement of the cord in the clamp. Withdraw the cords from the bushes (20) and tie the ends together.
- 5.10 Stand the pedestal on its wheels.
- 5.11 Referring to Fig 6.5 remove six screws (25) securing the fixed tube assembly to the tank and lift off the column and ram assembly complete.

6 To dismantle the column proceed as follows:

- 6.1 Referring to Fig 6.7 remove circlip (26) from the first stage cylinder (6) to release it from the ram plate (31).
- 6.2 Remove eight screws (32), separate the first stage ram plate (31) from the column bottom tube (33).
- 6.3 Withdraw the second stage cylinder (4), the first stage cylinder (6) and associated parts from the second stage ram plate (34).
- 6.4 Temporarily refit the first stage ram plate to the bottom tube.
- 6.5 Referring to Fig 6.5 remove four screws (16) which secure each of the adjustable cord anchor assemblies (26-31) and withdraw the assemblies from the column.

6.6 Disconnect the cords (26) from the adjusters (27) noting the way in which the cords are secured in the adjusters.

NOTE: Cords which have been disconnected from the adjusters must be replaced with new cords on reassembly.

6.7 Referring to [Fig 6.4](#) remove two screws (18) securing each of the four top track clamps (19) and remove the clamps.

6.8 Withdraw the bottom tube, complete with the centre tube and the top tube, from the flange end of the fixed tube. Secure the free ends of the tracks to the bottom tube.

6.9 Referring to [Fig 6.3](#) remove four screws (17) which secure the centre tube cover plate (16) and remove the plate.

6.10 Referring to [Fig 6.7](#) remove the screws (32) which have been used to secure the first stage ram plate (31) to the bottom tube (33).

6.11 Remove joining links (37) to disconnect the chains (38) from the adjusters (28) in the ram plate. Withdraw the cords which pass through the plate.

6.12 Referring to [Fig 6.4](#) remove two screws (25) which secure each of the bottom pulley shafts (26) to the bottom tube and remove the pulley assemblies. Draw the ends of the cords back into the bore of the bottom tube.

6.13 Withdraw the centre tube, complete with the top tube, from the lower end of the bottom tube. Secure the free ends of the tracks to the centre tube.

6.14 Referring to [Fig 6.7](#) remove four screws (32) which secure the second stage ram plate (34) to the centre tube (35).

6.15 Referring to [Fig 6.2](#) remove two screws (2) securing each of the four top track clamps (3) and remove the clamps.

6.16 Withdraw the top tube from the lower end of the centre tube, allowing the chains to run over the sprockets inside the centre tube. Secure the free ends of the tracks to the top tube.

NOTE: Access to all parts of the column at this point is possible. The replacement procedure for piece parts is self-evident.

Ram

7 To remove the ram assembly without removing the column:

NOTE: The ram assembly consists of a first stage piston inside a first stage cylinder which is, in turn, inside a second stage cylinder.

7.1 Remove any load from the head mounting platform.

7.2 Connect nitrogen charging equipment to the charging point and completely depressurize the pedestal.

- 7.3 Lay the pedestal on its side.
- 7.4 Referring to [Fig 6.6](#) slacken the four screws (10) at each end of the manifold (4) to allow the 'O' ring seal (8) to unseat and any residual pressure in the tank to exhaust. Remove screws (10) and washers (9).
- 7.5 Withdraw the first stage piston (5) and the manifold (4) together from the bore of the first stage cylinder.
- 7.6 Close the column to its lowest position.
- 7.7 Slacken two screws (17) and remove the cords (21) from cord clamps (19). Note the arrangement of the cord in the clamp.
- 7.8 Referring to [Fig 6.7](#) remove circlip (26) from the end of the first stage cylinder (6) to release it from the ram plate (31).
- 7.9 Remove eight screws (32), separate the first stage ram plate (31) from the column bottom tube (33) and allow it to hang on the chains.
- 7.10 The second stage cylinder (4) and the first stage cylinder (6) may now be withdrawn from the second stage ram plate (34).
- 7.11 Service the ram assembly as necessary. Referring to [Fig 6.7](#), fit new 'O' ring seals throughout. Pack between bearings and coat walls of piston and cylinders with Chesterton white grease No. 622 ([Section 3](#)).

Safety valve, charging valve and pressure gauge

- 8 To replace a defective safety valve, charging valve or pressure gauge proceed as follows:
- 8.1 Connect nitrogen charging equipment to the charging point and completely depressurize the pedestal.
- 8.2 Remove the defective item and replace with new or serviceable item. Fit new bonded seals.
- 8.3 Charge the pedestal ([Section 2](#)).
- 8.4 In the case of safety valve replacement refer to [Section 4](#).
- 8.5 Carry out leak check ([Section 4](#)).

Assembly

Column and ram

- 9 The arrangement of cords and chains within the column assembly is shown diagrammatically in [Fig 5.1](#).
- 10 To assemble the column and ram:
 - 10.1 Referring to [Fig 6.2](#), assemble top tube except for top track clamps (3).

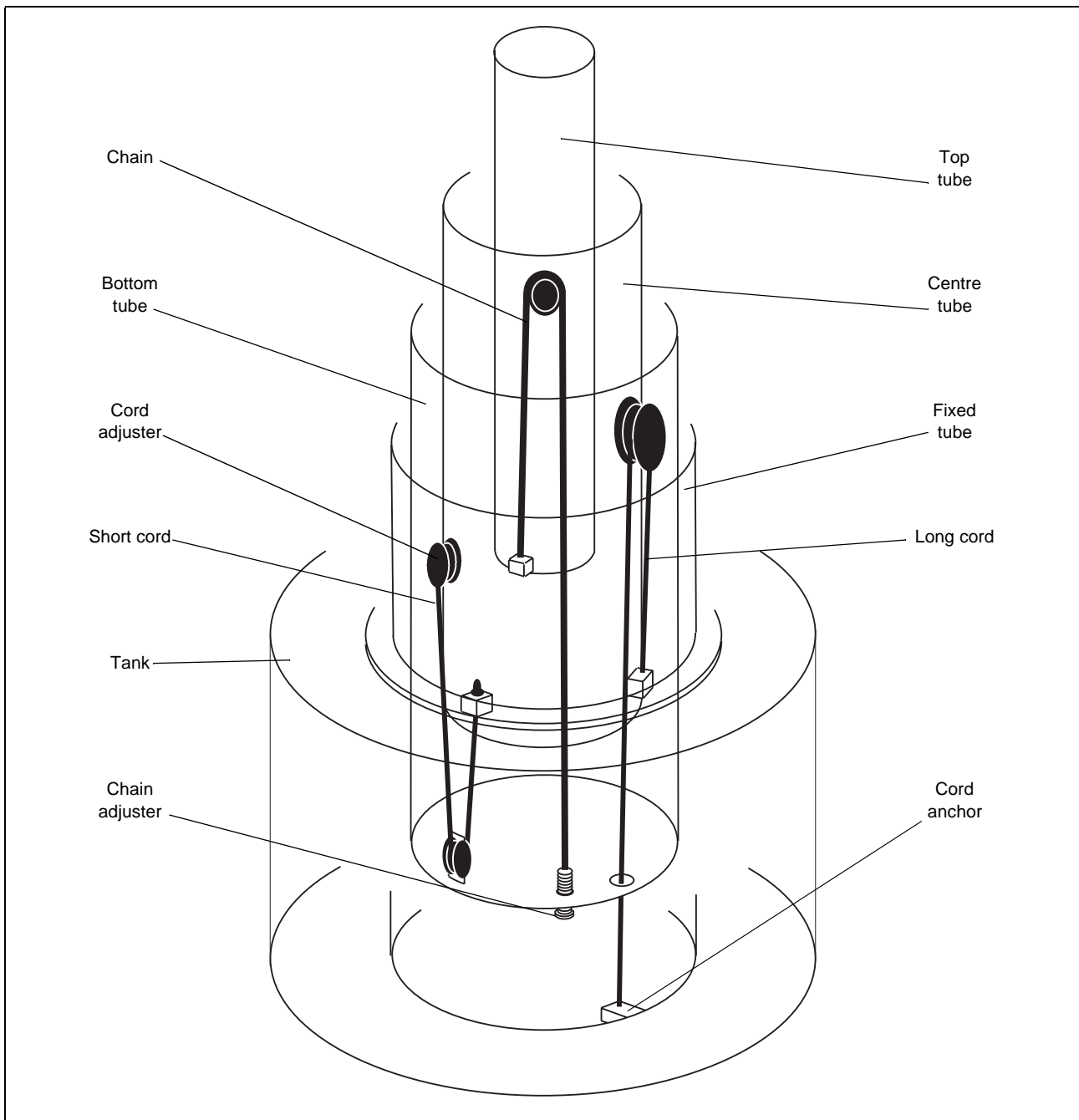


Fig 5.1 Arrangement of cords and chains in the column

- 10.2 Attach chains (10) to top tube anchor brackets (8) noting that anchor pins (6) are available in different lengths.
- 10.3 Referring to [Fig 6.3](#), assemble centre tube completely except for top track clamps (26) and cover (16).
- 10.4 Fully back off four adjustable rollers on centre tube.
- 10.5 Insert top tube into lower end of centre tube, making sure that stop lugs on top tube will engage with stops fitted in centre tube. Leave chains trailing out of lower end of centre tube.
- 10.6 Adjust rollers on centre tube ([Section 2](#)).
- 10.7 Referring to [Fig 6.3](#), lead chains (15) up through centre tube, over sprockets (14) and down through centre tube.
- 10.8 Referring to [Fig 6.7](#), feed free ends of chains through the holes in second stage ram plate (34) and secure ram plate to centre tube with four screws (32).
- 10.9 Referring to [Fig 6.2](#) secure four top track clamps (3) to top tube (1) with screws (2).
- 10.10 Referring to [Fig 6.3](#) fit long cords (32) and short cords (34) to centre tube (31), ensuring that the cords lead correctly from the attachment lugs on the tube.
- 10.11 Referring to [Fig 6.4](#) assemble bottom tube complete except for top track clamps (19), tube bracket (34), cover (15) and lower pulleys (26-29).
- 10.12 Fully back off four adjustable rollers on bottom tube.
- 10.13 Referring to [Fig 6.4](#), lead long cords ([Fig 6.3](#) item 32) round top pulleys (11) inside bottom tube and out through lower end of bottom tube. Ensure that cords pass between pulley and Spirol pin (21) on each side of pulley.
- 10.14 Insert centre tube assembly into lower end of bottom tube, making sure that stop lugs on centre tube will engage with stops fitted in bottom tube. Check that long cords lead correctly.
- 10.15 Adjust rollers on bottom tube ([Section 4](#)).
- 10.16 Referring to [Fig 6.3](#) fit top track clamps (26) to centre tube.
- 10.17 Referring to [Fig 6.4](#) feed short cords out through slots for lower pulleys (26-29) in bottom tube.
- 10.18 Referring to [Fig 6.7](#) fit chain adjusters (28 - 30) to first stage ram plate and connect chains using links (37), making sure that rubber sleeve (36) is fitted on each chain.
- 10.19 Referring to [Fig 6.3](#) feed free ends of long cords (32) through holes in ram plate.
- 10.20 Referring to [Fig 6.7](#), temporarily secure first stage ram plate (31) to bottom tube (33) using two screws (32).
- 10.21 Referring to [Fig 6.4](#), fit lower pulleys (26-29), ensuring that short cords pass between pulley and lower edge of pulley slot.
- 10.22 Referring to [Fig 6.5](#), assemble fixed tube complete except for cord adjuster assemblies (27 - 31), friction assembly (19 - 23) and brake assembly (34 - 41).

- 10.23 Fully back off four adjustable rollers on fixed tube.
- 10.24 Insert bottom tube assembly into lower end of fixed tube, making sure that stop lugs on bottom tube will engage with stops fitted in fixed tube.
- 10.25 Adjust rollers on fixed tube ([Section 4](#)).
- 10.26 Referring to [Fig 6.4](#) fit track top clamps (19) on bottom tube and secure with screws (18).
- 10.27 Feed short cords out through cord adjuster holes in fixed tube.
- 10.28 Referring to [Fig 6.5](#) thread cord adjusters (27) onto short cords (26), notched side towards tubes and pull up close to fixed tube.
- 10.29 Fully extend column, allowing short cords to draw back through adjusters.
- 10.30 Mark the free end of each short cord at the point where it emerges from the adjuster.
- 10.31 Collapse the column and make a crown knot with a single round of back splicing in short cord at the marked position. Trim and heat-seal ends of strands close to splice.
- 10.32 Draw short cords through adjusters to seat crown knot in bore of adjuster, assemble adjuster components (27- 31) and secure to fixed tube using screws (16).
- 10.33 Referring to [Fig 6.5](#), fit friction assembly (19 - 23) and brake assembly (34 - 41) to fixed tube using screws (14) and (32) respectively.
- 10.34 Referring to [Fig 6.7](#) fit circlip (40) to second stage cylinder (4). Install lock ring (39) above circlip, ensuring that recess faces circlip. Secure ring to circlip using plate (21) and screw (22) with Loctite 221.
- 10.35 Fit circlip (13) to upper groove in first stage cylinder (6).
- 10.36 Assemble second stage cylinder (4) to first stage cylinder (6), after servicing cylinder and piston sub-assemblies ([Para 7.11](#))
- 10.37 Remove first stage ram plate (31), but do not disconnect chains or unthread cords from ram plate.
- 10.38 Install second stage cylinder and first stage cylinder assembly into second stage ram plate (34).
- 10.39 Install lock ring (27) on exposed part of first stage cylinder (6) to abut circlip (13), ensuring that recess faces circlip.
- 10.40 Fit first stage ram plate (31) onto first stage cylinder and secure with circlip (26).
- 10.41 Refit first stage ram plate to bottom tube (33) using eight screws (32).
- 11 To install the column and ram proceed as follows:
- 11.1 Referring to [Fig 6.5](#), install the complete column assembly on the base ensuring that the facing flats on the support column are matched with the corresponding flats on the tank. Secure with six screws (25).
- 11.2 Lay pedestal on its side with flat on fixed tube uppermost. Use wooden blocks to support the unit in this position. Referring to [Fig 6.6](#), thread cords (21) down through bushes (20).

11.3 Referring to [Fig 6.7](#), assemble first stage piston, fit new 'O' ring seal (24) and secure to manifold (25) with three screws (23). Do not tighten screws at this stage.

11.4 Referring to [Fig 6.6](#), install assembled piston and manifold to tank, ensuring that a new 'O' ring seal (8) is fitted and secure with eight screws (10) and washers (9). Do not tighten screws at this stage.



WARNING!: This pedestal must be charged only with clean dry air or nitrogen. A pressure reducing valve must be fitted to the pressure line between the nitrogen cylinder and the outlet connection of the hose. The reducing valve must be screwed into the nitrogen cylinder outlet. The maximum pressure on the outlet side of the reducing valve when charging this pedestal must not exceed 280psi (19.31bar)

11.5 Connect nitrogen supply to the charging point on the pedestal. A recommended charging kit for this pedestal is the charging valve assembly, Vinten Part No. 3702-32. Note that this piece of equipment is NOT a pressure reducing valve.

11.6 Apply nitrogen pressure slowly and use only sufficient to cause the column to extend to its full extent. Do not exceed 50psi (3.45bar). Maintain tension in cords as column extends.

11.7 When column is fully extended pull cords taut, secure ends of cords as noted in [Para 5.9](#) and secure using clamp (19) and screw (17).

11.8 Referring to [Fig 6.7](#), tighten nuts (30) on chain adjusters (28) to remove all perceptible slack from chains and lock with locknuts (29).

11.9 Return pedestal to upright position.

11.10 Referring to [Fig 6.5](#), use a screwdriver to turn cord adjusters (27) clockwise to take up slack in cords and lock adjustment by tightening nuts (30).

11.11 Referring to [Fig 6.4](#), place cover (15) on column. Do not insert screws (16) at this stage.

11.12 Referring to [Fig 6.3](#), install cover (17) and insert four screws (17). Do not tighten screws at this stage.

11.13 Referring to [Fig 6.8](#), install weight tray assembly and secure with four screws (6). Do not tighten screws at this stage.

11.14 Slightly tilt pedestal using a wooden block under one wheel bracket to give access to screws in manifold.

11.15 Place a mass of about 11 kg (24 lb) on the weight tray and fully compress the column to centralize the ram components.

11.16 Referring to [Fig 6.6](#), tighten screws in manifold commencing with the three screws holding the ram to the manifold (7), followed by the eight screws holding the manifold to the tank (10).

11.17 Exercise the column by raising and lowering to full extent at least twice, ensuring that smooth action is available over the complete range.

11.18 If sticking is noted slacken off then retighten screws in manifold. Repeat until smooth action is available over the complete range.

11.19 Allow column to rise to its full extent and remove mass from weight tray.

- 11.20 Fit steering assembly ([Para 14](#)).
- 11.21 Place a mass of about 11 kg (24 lb) on the weight tray and fully compress the column to centralise the steering assembly in the weight tray.
- 11.22 Allow column to rise to its full extent and remove mass from weight tray.
- 11.23 Referring to [Fig 6.8](#), tighten four screws (6) to secure weight tray.
- 11.24 Referring to [Fig 6.3](#), tighten four screws (17) on cover (16).
- 11.25 Charge pedestal to working pressure ([Section 2](#)).
- 11.26 Carry out leak check ([Section 4](#))

Ram

- 12 To assemble the ram:
 - 12.1 Referring to [Fig 6.7](#) fit circlip (40) to second stage cylinder (4). Install lock ring (39) above circlip, ensuring that recess faces circlip. Secure ring to circlip using plate (21) and screw (22) with Loctite 221.
 - 12.2 Fit circlip (13) to upper groove in first stage cylinder (6).
 - 12.3 Assemble second stage cylinder (4) to first stage cylinder (6), after servicing cylinder and piston sub-assemblies ([Para 7.11](#)).
- 13 To install the ram:
 - 13.1 Remove first stage ram plate (31), but do not disconnect chains or unthread cords from ram plate.
 - 13.2 Install second stage cylinder and first stage cylinder assembly into second stage ram plate (34).
 - 13.3 Install lock ring (27) on exposed part of first stage cylinder (6) to abut circlip (13), ensuring that recess faces circlip.
 - 13.4 Fit first stage ram plate (31) onto first stage cylinder (6) and secure with circlip (26).
 - 13.5 Secure first stage ram plate to column bottom tube (33) using eight screws (32).
 - 13.6 Referring to [Fig 6.7](#), assemble first stage piston, fit new 'O' ring seal (24) and secure ram to manifold (25) with three screws (23). Do not tighten screws at this stage.
 - 13.7 Referring to [Fig 6.6](#), install assembled piston and manifold to tank, ensuring that a new 'O' ring seal (8) is fitted and secure with eight screws (10) and washers (9). Do not tighten screws at this stage.
 - 13.8 Thread cords (21) through bushes (20).

13.9 Stand pedestal upright and mount on blocks positioned immediately inboard of the wheels.



WARNING!: This pedestal must be charged only with clean dry air or nitrogen. A pressure reducing valve must be fitted to the pressure line between the nitrogen cylinder and the outlet connection of the hose. The reducing valve must be screwed into the nitrogen cylinder outlet. The maximum pressure on the outlet side of the reducing valve when charging this pedestal must not exceed 280psi (19.31bar)

13.10 Connect nitrogen supply to the charging point on the pedestal. A recommended charging kit for this pedestal is the charging valve assembly, Vinten Part No. 3702-32. Note that this piece of equipment is NOT a pressure reducing valve.

13.11 Apply nitrogen pressure slowly and use only sufficient to cause the column to extend to its full extent. Do not exceed 50psi (3.45bar). Maintain tension in cords as column extends.

13.12 When column is fully extended pull cords taut, secure ends of cords as noted in [Para 5.9](#) and secure using clamp (19) and screw (17).

13.13 Adjust bearings in column ([Section 4](#)).

13.14 Exercise the column by raising and lowering to full extent at least twice, ensuring that smooth action is available over the complete range.

13.15 Referring to [Fig 6.6](#), tighten screws in manifold commencing with the three screws holding the ram to the manifold (7), followed by the eight screws holding the manifold to the tank (10).

13.16 Exercise the column by raising and lowering to full extent at least twice, ensuring that smooth action is available over the complete range.

13.17 Repeat [Para 13.14](#). If sticking is noted slacken off then retighten screws in manifold. Repeat until smooth action is available over the complete range.

13.18 Remove pedestal from blocks.

13.19 Charge pedestal to working pressure ([Section 2](#)).

13.20 Carry out leak check ([Section 4](#)).

Steering assembly

14 To install the steering assembly ([Fig 6.9](#)):

14.1 Position steering box so as to allow shaft (20) to be inserted into bearing on base.

14.2 Install retained shims (45, 46) and gear bracket (21) and secure to fixed tube with four screws (44).

14.3 Install bracket cover (13) and secure with four screws (10).

14.4 Extend upper drive shaft (3) and install washer (2). Insert shaft in coupling (1), ensuring that the reference marks are aligned and secure with new spring pin (61).

14.5 Referring to [Fig 6.4](#), secure tube bracket (34) to bottom tube with two screws (23). Secure cover plate (15) to column with six screws (16).

- 14.6 Referring to [Fig 6.9](#), fit steering chain (23) and joining link (24).
- 14.7 Slacken clamp bolt (26).
- 14.8 Ascertain wheel position (set of wheels under change-over gear).
- 14.9 Align steering ring indicators to the wheel position.
- 14.10 Tighten clamping bolt (26).
- 14.11 Referring to [Fig 6.14](#), refit change-over gear cover (9).

Column bearings

- 15 To install column bearings:
 - 15.1 Before refitting column bearings to a tube set all the adjustable bearings on that tube to minimum setting.
 - 15.2 Fit bearing assembly into place and secure with four countersunk socket headed screws.
 - 15.3 Adjust bearings ([Section 4](#)).

Other replacements

- 16 All other replacements are simple and the method is self-evident after a brief study of the particular item and the exploded drawing in [Section 6](#). Replacements affecting wheels or steering chains are equally simple but require a check on tracking and chain tensioning ([Section 4](#)).

NOTE: When fitting a crab/steer pin circlip, shim as necessary to allow 1/32in. clearance between circlip and clutch body.
If the steering change-over gear ([Fig 6.10](#)) has been dismantled, secure items (48) and (50) with Loctite 221 during assembly.

Section 6

Illustrated Parts List

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Introduction

1 This parts list is issued for the Fulmar pedestal, manufactured by VINTEN BROADCAST LIMITED, Western Way, Bury St. Edmunds, Suffolk, IP33 3TB, England.

Ordering spare parts

- 2 Always quote the pedestal serial number.
- 3 When ordering a spare part, please quote the part number, NOT the item number.

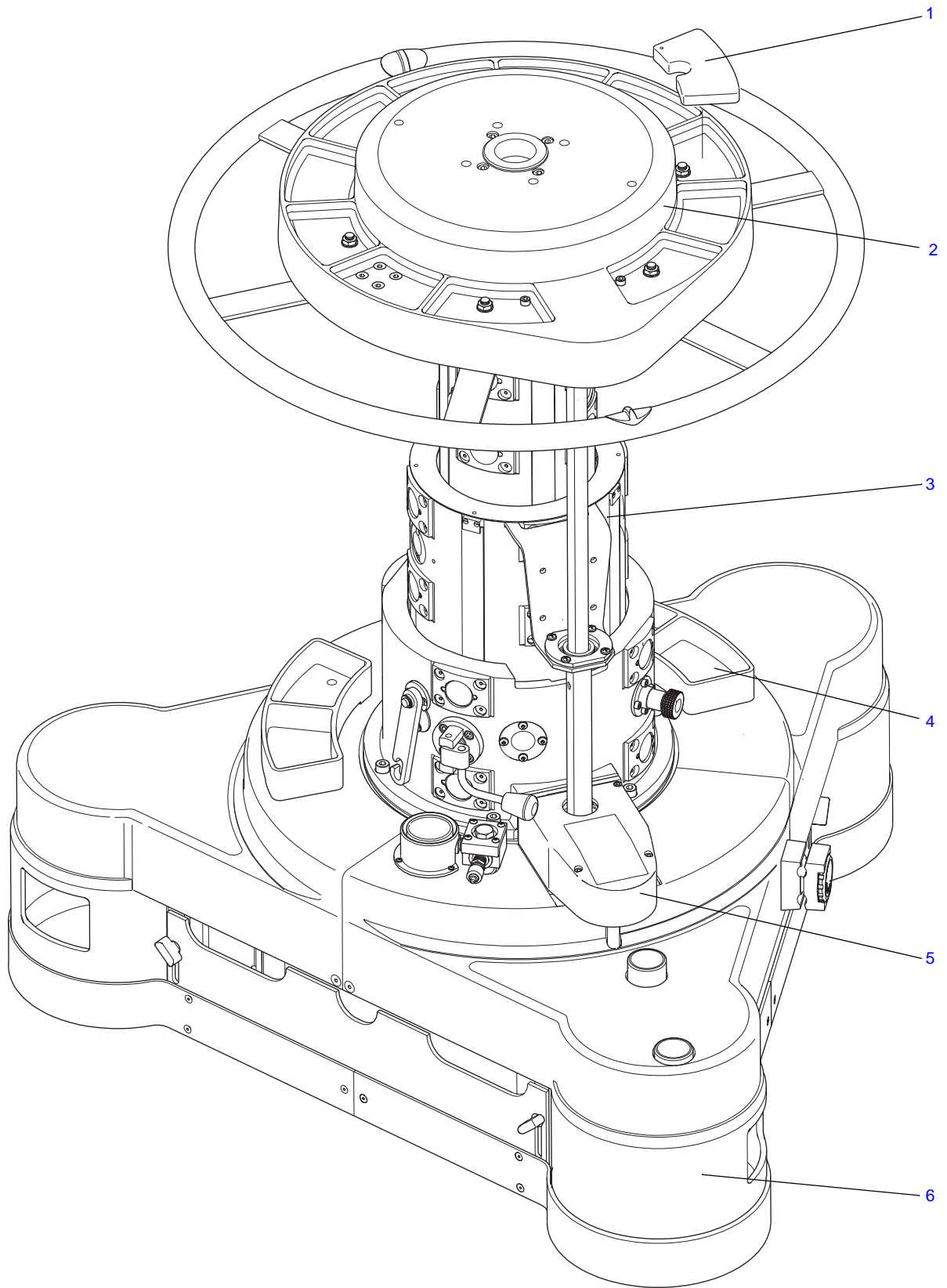
4 Certain items form part of -900SP series composite spare parts. These are detailed in [Fig 6.15](#) and are indicated in the parts list by an asterisk (*).

5 Due to restrictions placed on the transportation of adhesives and other materials, please obtain supplies of consumable materials from your local distributor.

Main assembly part numbers

6 Ensure that the correct serial and part numbers are quoted when ordering main assemblies.

Assembly	Part No.
Base assembly	3702-11
Column assembly	3702-12
Ram assembly	3702-14
Weight tray assembly	3702-13
Steering assembly	3702-24
Wheel housing assembly (steering)	3702-27
Wheel housing assembly (adjustable sprocket)	3702-28
Wheel housing assembly (fixed)	3702-29

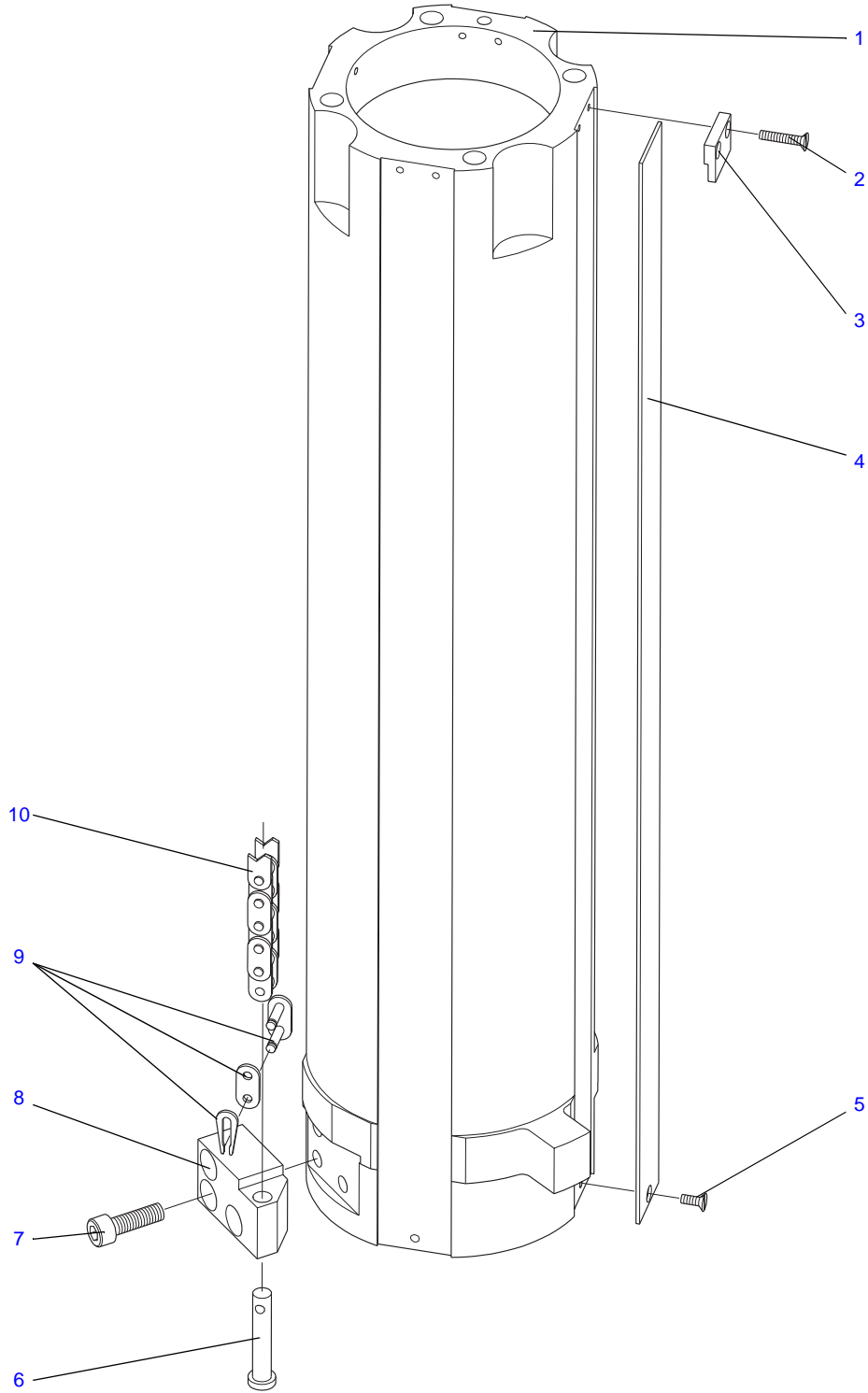


FULIP01

Fig 6.1 Fulmar Pedestal

**Fig 6.1 Fulmar Pedestal**

Item	Part No.	Nomenclature	Qty
1	3702-335	Trim weight (large)	8
2	3702-13	Weight tray assembly (Fig 6.8)	1
3	3702-12	Tube assembly	1
4	3702-213	Weight box	2
5	3702-24	Steering assembly (Fig 6.9)	1
6	3702-11	Base assembly	1



FULIP02

Fig 6.2 Fulmar Pedestal - Top Tube

Fig 6.2 Fulmar Pedestal - Top Tube

Item	Part No.	Nomenclature	Qty
1	3702-205	Top tube	1
2	L072-005	Screw, csk, 4-40 in. UNC x 3/4 in. lg	8
3	3702-234	Track clamp, top	4
4	3702-256	Track. top tube	4
5	L072-035	Screw, csk, 4-40 in. UNC x 1/4 in. lg	8
6	3702-249 or 3702-250	Anchor pin, chain or Anchor pin, short	1
7	L076-922	Screw, skt cap hd, 1/4 in. UNC x 3/4 in. lg	6
8	302-248	Anchor, chain	2
9	J202-061	Connecting link, single, 3/8 in. pitch chain	2
10	J202-014	Roller chain, 3/8 in. pitch, 83 pitches (Fig 6.3)	2

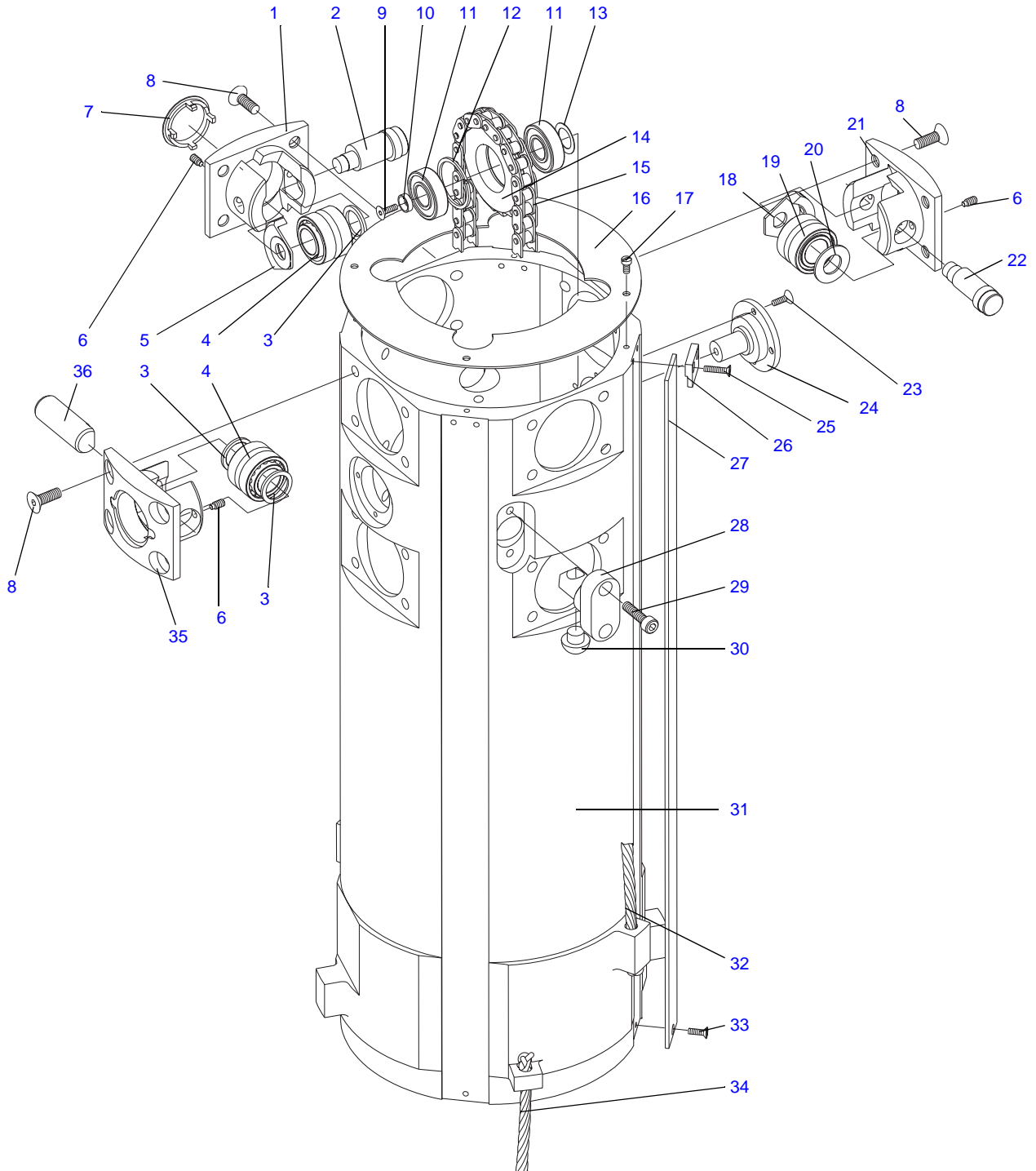


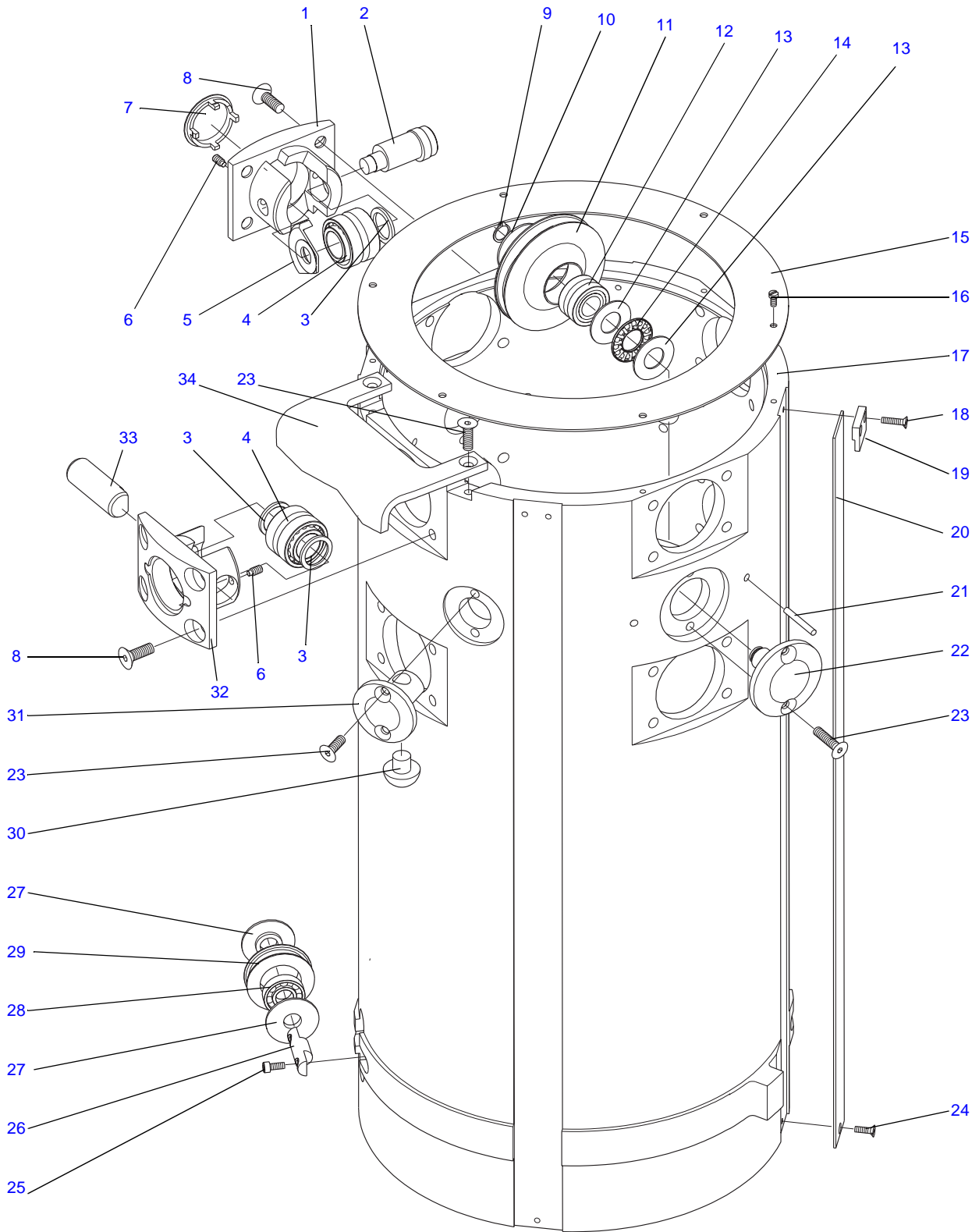
Fig 6.3 Fulmar Pedestal - Centre Tube

Fig 6.3 Fulmar Pedestal - Centre Tube

Item	Part No.	Nomenclature	Qty
	3702-36	Bearing assembly (adjusting), comprising:	2
1	3702-391	Bracket roller, adjusting	1
2	3176-223	bearing spindle	1
3	3176-228	Shim	1
4	P203-006	Bearing, needle roller, radial, with angular contact ball bearing, 15 mm ID x 28 mm OD x 20 mm long	1
5	3176-222	Adjuster, eccentric	1
6	L075-804	Screw, grub, half dog point, socket head, 10-32UNF x 1/4 in. long	2
7	3702-356	Plug, roller bracket	8
8	L076-002	Screw, skt csk hd, 1/4 in. UNF x 1/2 in. lg	32
9	M005-903	Screw, skt csk hd, M4 x 12 mm lg	2
10	M600-001	Washer, GN 184-16	2
11	P200-201	Bearing, 6001-22	4
12	M701-039	Snap ring, M2300-0280	2
13	M602-003	Shim P12-18-0.3	8
14	3702-456	Sprocket, lifting	2
15	J202-014	Roller chain, 3/8 in. pitch, 83 pitches (Fig 6.7)	2
16	3702-264	Cover, centre tube	1
17	L073-407	Screw, fillister hd, 6-32 in. UNF x 1/4 in. lg	4
	3702-37	Bearing assembly (adjusting), comprising:	2
6	L075-804	Grub screw, skt hd, 10-32 in. UNF x 1/4 in. lg	2
18	3702-231	Adjuster, eccentric	1
19	N500-021	Bearing, needle roller, NK12/20	1
20	3702-372	Washer, eccentric bearing	1
21	3702-206	Bracket roller, adjusting	1
22	3702-229	Pin. adjustable	1
23	L073-011	Screw, csk hd, 6-32 in. UNF x 3/8 in. lg	8
24	3702-455	Stub shaft, sprocket	2
25	L072-005	Screw, csk, 4-40 in. UNC x 3/4 in. lg	8
26	3702-234	Track clamp, top	4
27	3702-257	Track, centre tube	4

Fig 6.3 Fulmar Pedestal - Centre Tube (Cont)

Item	Part No.	Nomenclature	Qty
28	3702-247	Stop, centre tube	2
29	L075-917	Screw, skt cap hd, 10-32 in. UNF x 3/8 in. lg	4
30	J550-001	Mushroom buffer	2
31	3702-204	Centre tube	1
32	3702-904SP*	3-strand pre-stretched Terylene cord, 1/4 in. dia x 50 in. lg (Fig 6.6)	2
33	L072-035	Screw, slotted csk hd, 4-40 in. UNC x 3/8 in. lg	4
34	3702-903SP*	3-strand pre-stretched Terylene cord, 1/4 in. dia x 28 in. lg (Fig 6.5)	2
	3702-35	Bearing assembly, comprising:	4
3	3176-228	Shim	2
4	P203-005	Bearing, needle roller, NK1B5902	1
6	L075-804	Grub screw, skt hd, 10-32 in. UNF x 1/4 in. lg	1
35	3702-207	Bracket roller	1
36	3704-224	Shaft	1



FULIP04

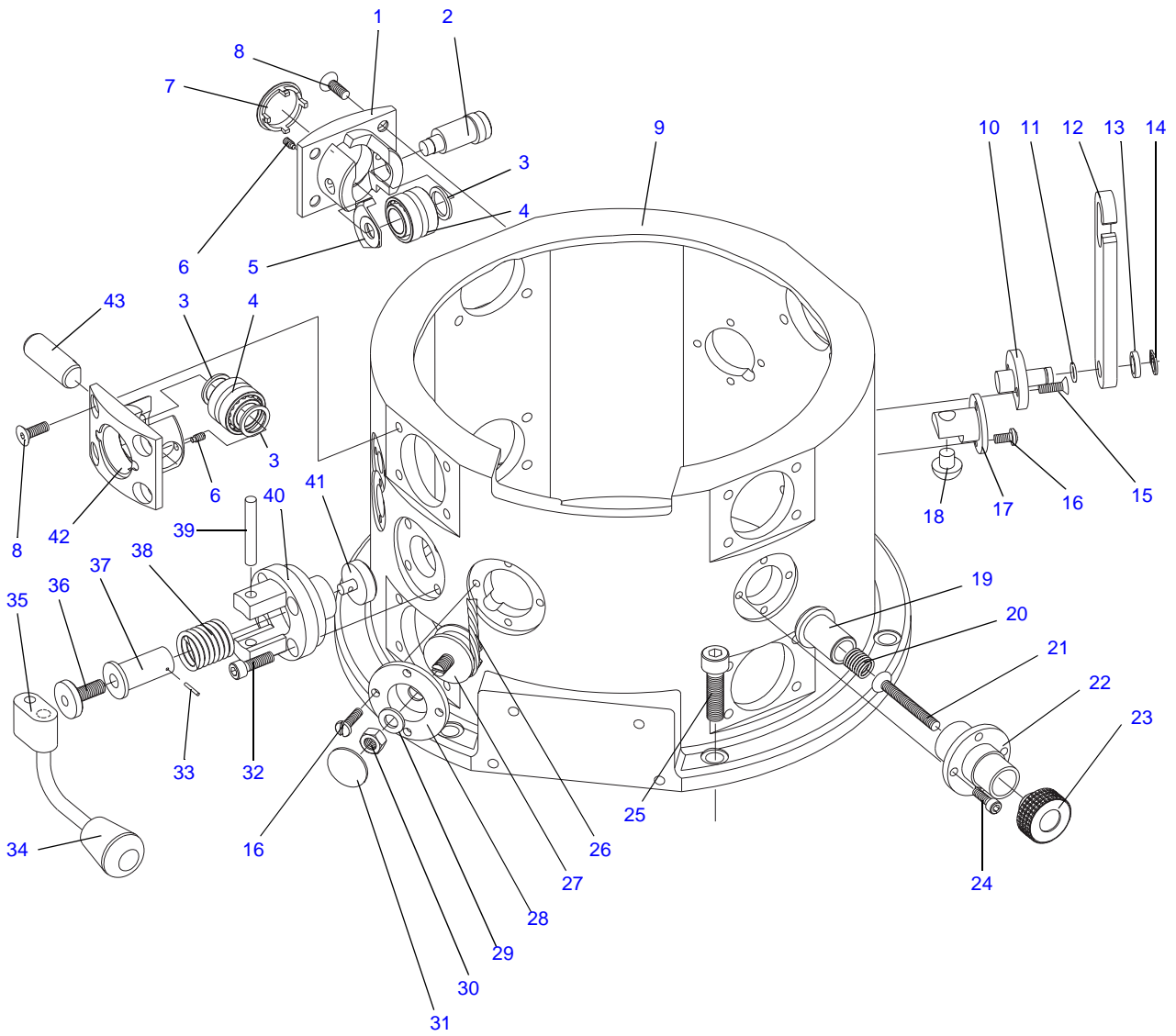
Fig 6.4 Fulmar Pedestal - Bottom Tube

Fig 6.4 Fulmar Pedestal - Bottom Tube

Item	Part No.	Nomenclature	Qty
	3702-36	Bearing assembly (adjusting), comprising:	2
1	3702-391	Bracket roller, adjusting	1
2	3176-223	bearing spindle	1
3	3176-228	Shim	1
4	P203-005	Bearing, needle roller, NK1B5902	1
5	3176-222	Adjuster, eccentric	1
6	L075-804	Grub screw, skt hd, 10-32 in. UNF x 1/4 in. lg	2
7	3702-356	Plug, roller bracket	8
8	L076-002	Screw, skt csk hd, 1/4 in. UNF x 1/2 in. lg	32
9	L701-007	External circlip	2
10	3702-355	Washer, retaining	2
11	3702-254	Pulley, top	2
12	P601-012	Needle bearing	2
13	P602-013	Thrust washer	4
14	P602-012	Needle thrust cage	2
15	3702-263	Cover, bottom tube	1
16	L073-407	Screw, fillister hd, 6-32 in. UNF x 1/4 in. lg	6
17	3702-203	Bottom tube	1
18	L072-005	Screw, csk, 4-40 in. UNC x 3/4 in. lg	8
19	3702-234	Track clamp, top	4
20	3702-258	Track, bottom tube	4
21	L800-042	Spirol pin, 1/8 in. dia x 1 in. lg	4
22	3702-252	Stud shaft, cord	2
23	L075-021	Screw, skt csk hd, 10-32 in. UNC x 1/2 in. lg	10
24	L072-035	Screw, slotted csk hd, 4-40 in. UNC x 3/8 in. lg	4
25	L073-906	Screw, skt cap hd, 6-32 in. UNC x 1/2 in. lg	4
26	3702-244	Shaft, bottom pulley	2
27	3702-246	Spacer	4
28	N200-002	Bearing, ball	2
29	3702-245	Pulley, bottom cord	2
30	J550-001	Mushroom buffer	2

Fig 6.4 Fulmar Pedestal - Bottom Tube (Cont)

Item	Part No.	Nomenclature	Qty
31	3702-243	Stop, bottom tube	2
	3702-35	Bearing assembly, comprising:	4
3	3176-228	Shim	2
4	P203-005	Bearing, needle roller, NK1B5902	1
6	L075-804	Grub screw, skt hd, 10-32 in. UNF x 1/4 in. lg	1
32	3702-207	Bracket roller	1
33	3704-224	Shaft	1
34	3702-337	Tube bracket (Fig 6.9)	1



FULIP05

Fig 6.5 Fulmar Pedestal - Fixed Tube

Fig 6.5 Fulmar Pedestal - Fixed Tube

Item	Part No.	Nomenclature	Qty
	3702-36	Bearing assembly (adjusting), comprising:	2
1	3702-391	Bracket roller, adjusting	1
2	3176-223	bearing spindle	1
3	3176-228	Shim	1
4	P203-005	Bearing, needle roller, NK1B5902	1
5	3176-222	Adjuster, eccentric	1
6	L075-804	Grub screw, skt hd, 10-32 in. UNF x 1/4 in. lg	2
7	3702-356	Plug, roller bracket	8
8	L076-002	Screw, skt csk hd, 1/4 in. UNF x 1/2 in. lg	32
9	3702-202	Fixed tube	1
10	3702-463	Lock pivot, extended	2
11	Q001-016*	'O' ring, 3/8 in. ID x 3/32 in. section	2
12	3702-50	Column lock assembly, RH	1
NI	3702-49	Column lock assembly, LH	1
13	M606-010	Plastic washer	2
14	L701-007	External circlip, Anderton 1400-3/8	2
15	L075-022	Screw, skt csk hd, 10-32 in. UNF x 1/2 in. lg	4
16	L075-503	Screw, pan hd, 10-32 in. UNF x 1/2 in. lg	12
17	3702-240	Stop, fixed tube	2
18	J550-001	Mushroom buffer	2
	3267-63	Friction assembly, comprising:	1
19	3702-901SP*	Friction shaft assembly	1
20	J532-039	Compression spring	1
21	M007-909	Screw, skt csk hd, M6 x 40 mm lg	1
22	3267-309	Friction body	1
23	C510-131	Knob	1
24	L075-921	Screw, skt cap hd, 10-32 in. UNF x 1/2 in. lg	4
25	L078-908	Screw, cap head, socket, 3/8-24UNC x 7/8 in. long	6
26	3702-903SP*	3-strand pre-stretched Terylene cord, 1/4 in. dia x 28 in. lg (Fig 6.3)	2
27	3702-242	Cord anchor, adjustable	2
28	3702-241	Bracket, anchor	2

Fig 6.5 Fulmar Pedestal - Fixed Tube (Cont)

Item	Part No.	Nomenclature	Qty
29	L602-111	Washer, 5/6 in. UNF	2
30	L501-165	Nut, full, 5/6 in. UNF	2
31	Q300-114	Hole plug, P-1000	2
32	L076-924	Screw, skt cap hd, 1/4 in. UNF x 7/8 in. lg	4
	3741-16	Brake assembly, comprising:	1
33	L800-019	Spirol pin, 1/16 in. dia x 1/2 in. lg	1
34	C510-035	Knob	1
35	3702-25	Handle assembly	1
36	3702-322	Adjuster	1
37	3702-321	Plunger	1
38	J532-036	Compression spring	1
39	L801-065	Dowel pin, 1/4 in. dia x 1 3/4 in. lg	1
40	3702-320	Body	1
41	3702-900SP*	Brake disc assembly	1
	3702-35	Bearing assembly, comprising:	4
3	3176-228	Shim	2
4	P203-005	Bearing, needle roller, NK1B5902	1
6	L075-804	Grub screw, skt hd, 10-32 in. UNF x 1/4 in. lg	1
42	3702-207	Bracket roller	1
43	3704-224	Shaft	1

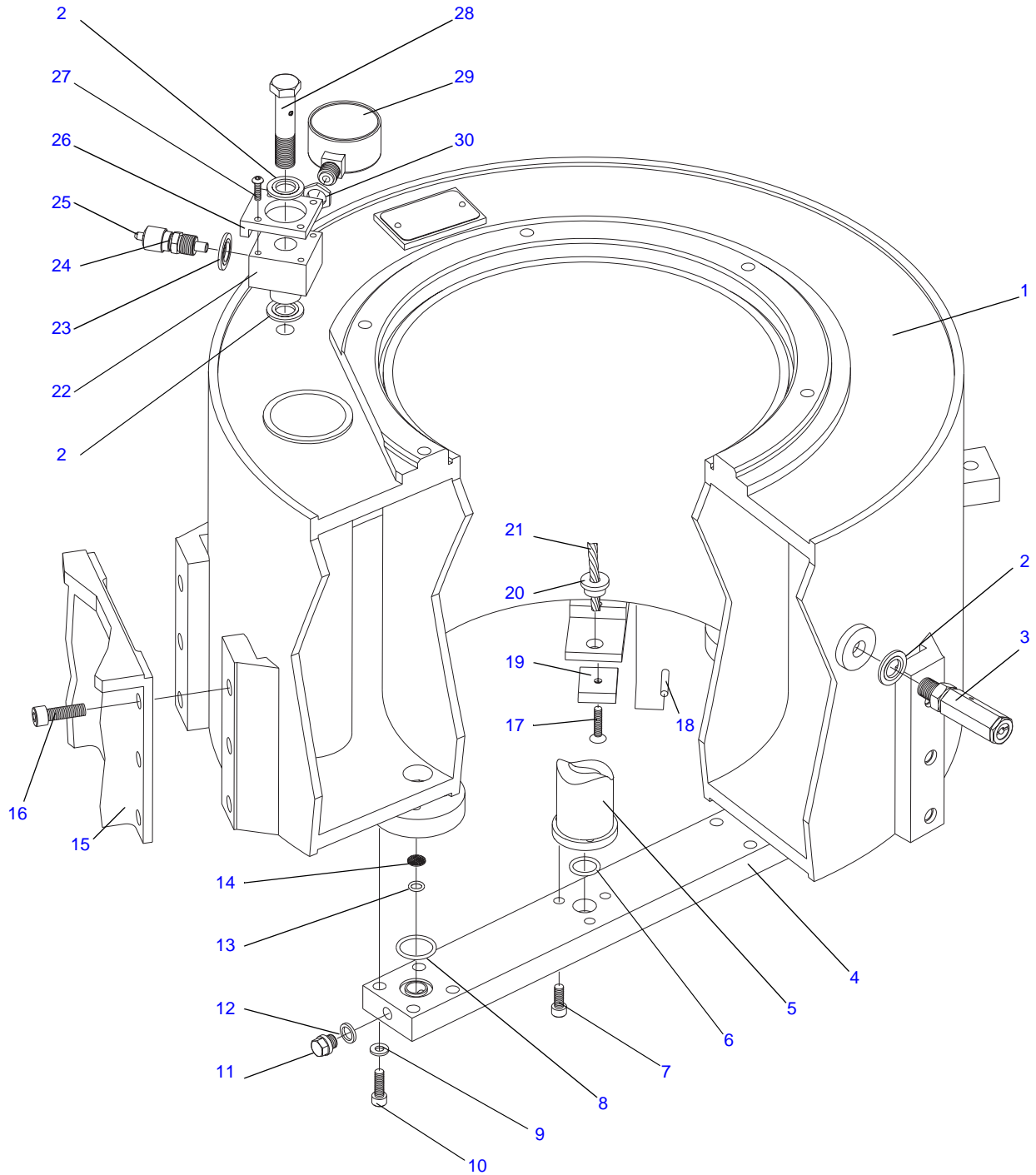


Fig 6.6 Fulmar Pedestal - Tank

Fig 6.6 Fulmar Pedestal - Tank

Item	Part No.	Nomenclature	Qty
1	3702-42	Pressure tank	1
2	Q200-011*	Bonded seal, Dowty PP-45-B	1
3	3702-46	Safety valve assembly	1
4	3702-255	Manifold	1
5	3702-14	Ram assembly (Fig 6.7)	1
6	Q900H006*	'O' ring, 3/4 in. ID x 3/32 in. sect	1
7	L075-918	Screw, skt cap hd, 10-32 in. UNF x 5/8 in. lg	3
8	Q001-030*	'O' ring, 7/8 in. OD x 3/32 in. sect	1
9	M600-007	Washer, M6	8
10	L076-922	Screw, skt cap hd, 1/4 in. UNF x 5/8 in. lg	8
11	J003-038	Plug, 1/8 in. BSP	1
12	Q200-008*	Bonded seal, Dowty PP-45-A	1
13	Q001-014*	'O' ring, 3/4 in. ID x 0.07 in. sect	1
14	3702-457	Filter	1
15	3702-27	Wheel housing assembly (steering) (Fig 6.10)	1
	3702-28	Wheel housing assembly (adjustable sprocket) (Fig 6.11)	1
	3702-29	Wheel housing assembly (fixed sprocket) (Fig 6.12)	1
16	L078-908	Screw, skt cap hd, 3/8 in. UNF x 7/8 in. lg	18
17	L075-020	Screw, csk hd, 10-32 in. UNF x 3/4 in. lg	2
18	L800-077	Spirol pin, 3/16 in. dia x 1 in. lg	2
19	3702-357	Bottom cord clamp	2
20	3702-378	Bush	2
21	3702-904SP*	3-strand pre-stretched Terylene cord, 1/4 in. dia x 50 in. lg (Fig 6.3)	2
	3702-33	Pressure gauge assembly, comprising:	1
2	Q200-011*	Bonded seal, Dowty PP-45-B	2
22	3054-206	Banjo	1
23	Q200-004*	Bonded seal, Dowty PP-45-3	1
24	3702-389	Schrader valve	1
25	3328-304	Pressure release button	1
26	3054-205	Banjo clamp	1
27	M005-505	Screw, skt butt hd, M4 x 12 mm lg	4
28	3954-202	Banjo bolt	1



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Fig 6.6 Fulmar Pedestal - Tank (Cont)

Item	Part No.	Nomenclature	Qty
29	J001-036	Pressure gauge, 0-400 psi	1
30	3419-227	Adaptor nut	1

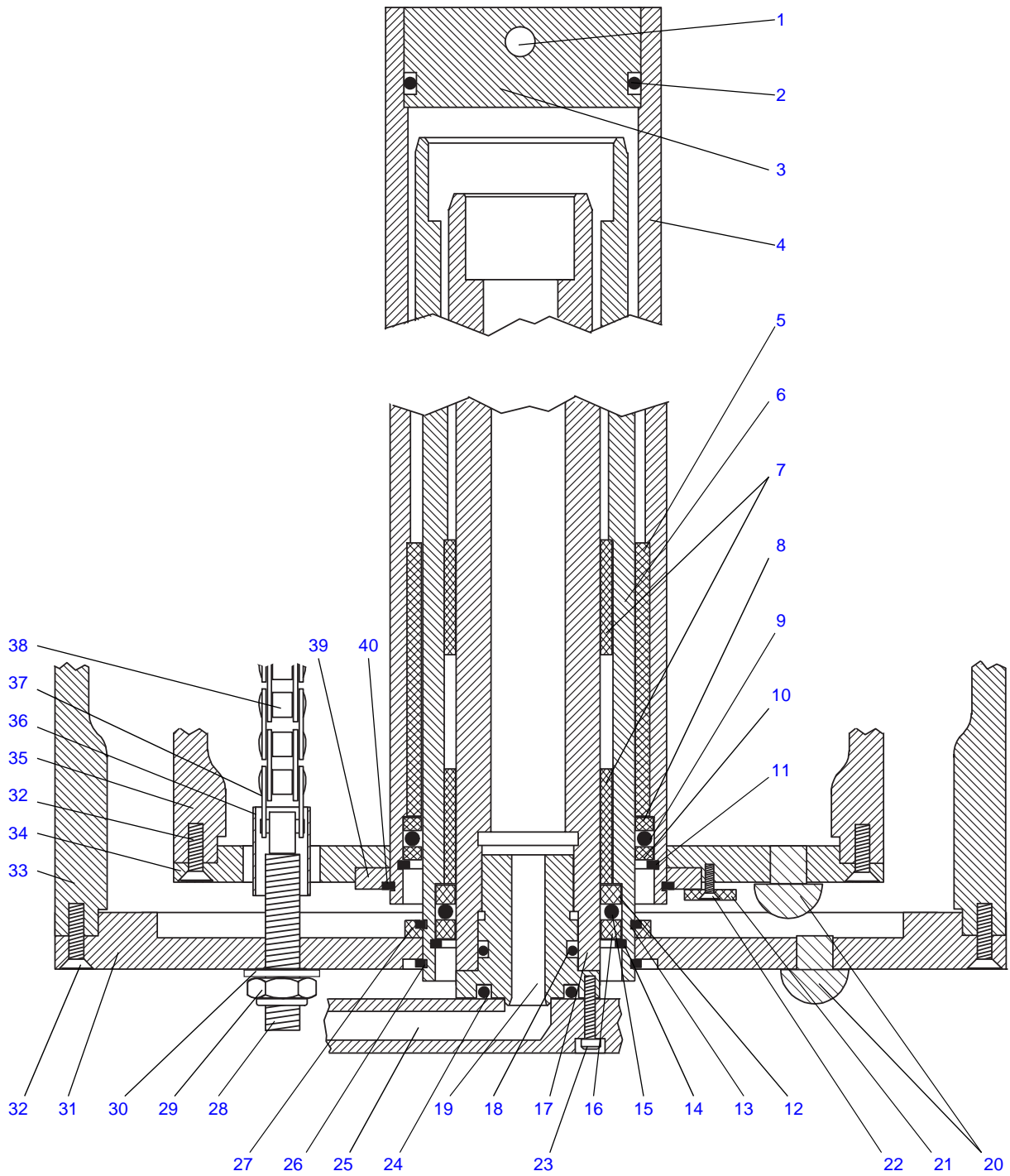


Fig 6.7 Fulmar Pedestal - Ram Assembly and Ram Plates

FULIP07

Fig 6.7 Fulmar Pedestal - Ram Assembly and Ram Plates

Item	Part No.	Nomenclature	Qty
	3702-14	Ram assembly, comprising:	
	3702-15	Cylinder assembly, 2nd stage, comprising:	1
1	L800-111	Spirol pin, 1/4 in. dia x 2 1/2 in. long	1
2	Q900H012*	'O' ring, 1 7/8 in. ID x 1/8 in. sect	1
3	3702-222	End plug	1
4	3702-220	Cylinder, 2nd stage	1
5	N001-031	D U bush, Glacier ref 32DU40	1
	3702-16	Cylinder assembly, 1st stage, comprising:	1
6	3702-223	Cylinder, 1st stage	1
7	N001-023	D U bush, Glacier ref 24DU16	2
8	3702-221	Seal retainer, 2nd stage	1
9	Q900H014*	'O' ring, 2 in. ID x 1/8 in. sect	1
10	3702-385	Seal retainer, 2nd stage (circlip side)	1
11	M700-033	Internal spring ring	1
12	3720-221	Seal retainer, 1st stage	1
13	M701-025	External spring ring	
14	M701-020	Internal spring ring	1
15	Q900H013*	'O' ring, 1 1/2 in. ID x 1/8 in. sect	1
16	3702-384	Seal retainer, 1st stage (circlip side)	1
17	3702-225	Piston, 1st stage	1
18	Q001-038*	'O' ring, 5/16 in. ID x 3/32 in. sect	1
19	3702-226	Plug, 1st stage piston	1
20	J550-001	Mushroom buffer	4
21	3702-386	Plate	1
22	L073-001	Screw, csk hd, 6-32 UNC x 3/8 in. lg	1
23	L075-918	Screw, skt cap hd, 10-32 in. UNF x 5/8 in. lg	3
24	Q900H006*	'O' ring, 3/4 in. ID x 3/32 in. sect	1
25	3702-255	Manifold	1
26	L701-028	External circlip	1
27	3702-388	Thrust ring, 1st stage	1
28	3702-261	Chain screw, adjusting	2

Fig 6.7 Fulmar Pedestal - Ram Assembly and Ram Plates (Cont)

Item	Part No.	Nomenclature	Qty
29	L501-170	Nut, Nyloc, 5/16 in. UNF	2
30	L602-112	Washer, 5/16in., heavy	2
31	3702-259	Ram plate, 1st stage	1
32	L075-006	Screw, csk hd, 10-32 UNC x 5/8 in. lg	12
33	3702-22	Bottom tube assembly (Fig 6.4)	1
34	3702-260	Ram plate, 2nd stage	1
35	3702-21	Centre tube assembly (Fig 6.3)	1
36	C885-621	Sleeve, h.75 x 1 in. lg	2
37	J202-061	Connecting link, 3/8 in. pitch chain	2
38	J202-014	Roller chain, 3/8 in. pitch, 83 pitches (Fig 6.3)	2
39	3702-387	Lock ring, circlip	1
40	M701-034	Circlip, external	1

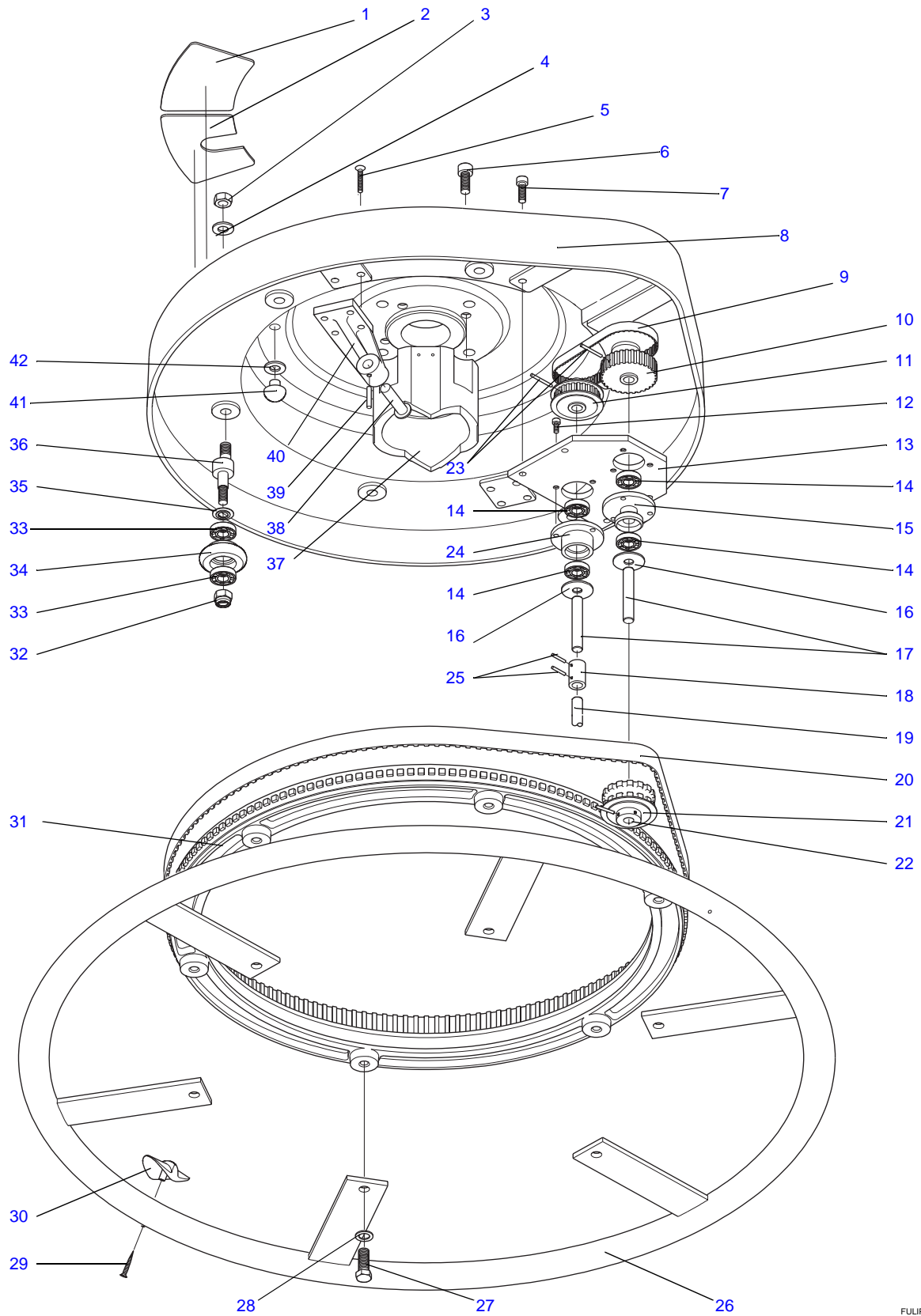


Fig 6.8 Fulmar Pedestal - Weight Tray Assembly

FULIP08

Fig 6.8 Fulmar Pedestal - Weight Tray Assembly

Item	Part No.	Nomenclature	Qty
1	3702-462	Weight storage lining	5
2	3702-460	Weight storage lining	4
3	L501-191	Nut, hex, 3/8 in. UNF	6
4	L602-123	Washer, 3/8 in.	6
5	L076-010	Screw, skt csk hd, 1/4 in. UNF x 3/4 in. lg	8
6	L077-920	Screw, skt cap hd, 5/16 in. UNF x 5/8 in. lg	4
7	L076-921	Screw, skt cap hd, 1/4 in. UNF x 5/8 in. lg	4
8	3702-208	Weight tray	1
9	J201-026	Timing belt, Daval 110XL 037	1
10	3702-354	Pulley, large	1
11	3702-353	Pulley, small	1
12	L075-916	Screw, skt cap hd, 10-32 in. UNF x 1/4 in. lg	66
13	3702-270	Plate, gear	1
14	N200-002	Ballrace, Hoffman S3	4
15	3702-277	Housing, bearing, top	1
16	3741-268	Shim, 13/16 in. dia	2
17	3702-279	Shaft, belt pulley	2
18	3702-280	Coupling, shaft (Fig 6.9)	1
19	3702-24	Steering assembly (Fig 6.9)	1
20	J201-031	Timing belt, Daval 600L 075	1
21	3702-311	Pulley, driven	1
22	L800-036	Spirol pin, 3/32 in. dia x 3/4 in. lg	1
23	L800-037	Spirol pin, 3/32 in. dia x 1 in. lg	2
24	3702-278	Housing, pulley bearing	1
25	L800-029	Spirol pin, 3/32 in. dia x 5/8 in. lg	2
26	3702-266	Steering wheel	1
27	L077-713	Screw, hex hd, 5/16 in. UNF x 3/4 in. lg	6
28	L602-111	Washer, 5/16 in.	6
29	L101-022	Screw, self-tapping, No. 6 x 1 in. lg	2
30	3419-228	Steering indicator	2
31	3702-208	Steering ring	1

Fig 6.8 Fulmar Pedestal - Weight Tray Assembly (Cont)

Item	Part No.	Nomenclature	Qty
	3702-41	Steering roller assembly, comprising:	6
32	L501-170	Nut, Nyloc, 5/16 in. UNF	1
33	P200-244	Bearing, FAG 609.2ZR	2
34	3702-269	Roller, steering ring	1
35	3702-392	Washer	1
36	3702-265	Shaft steering pulley	1
37	3702-205	Top tube (Fig 6.2)	1
38	3702-334	Lock pin	2
39	L800-052	Spirol pin, 1/8 in. dia x 7/8 in. lg	2
40	3702-340	Lock bracket, LH	1
NI	3702-333	Lock bracket, RH	1
41	J550-001	Mushroom buffer	2
42	L602-122	Washer, 3/8 in.	2

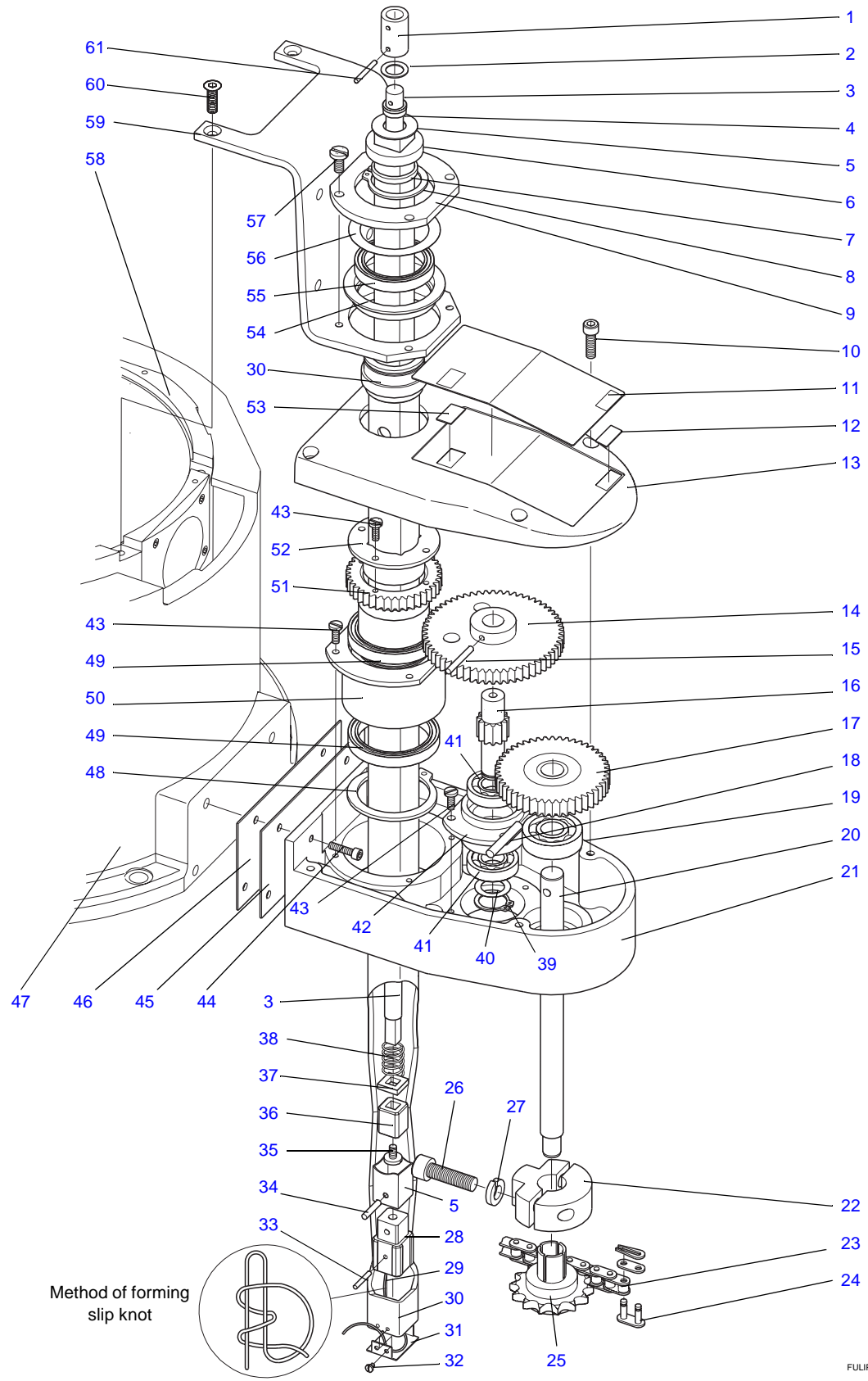


Fig 6.9 Fulmar Pedestal - Steering Assembly

FULIP09

Fig 6.9 Fulmar Pedestal - Steering Assembly

Item	Part No.	Nomenclature	Qty
1	3702-280	Coupling, shaft (Fig 6.8)	1
2	3702--374	Washer	1
3	3702-313	Drive shaft	1
4	3702-365	Square tube bush	1
5	3702-19	Small drive tube, brazed	1
6	3702-315	Buffer	1
7	3702-364	Large square tube bush	1
8	L701-01	External circlip, 1400-131	1
9	3702-312	Tube bearing clamp	1
10	L075-920	Screw, skt cap hd, 10-32 in. UNF x 1/2 in. lg	4
11	3423-12	Steering box graphic	1
12	3702-276	Serial No. label	1
13	3702-215	Bracket cover	1
14	3702-292	Gear, intermediate	1
15	L800-042	Spirol pin, 1/8 in. dia x 1 in. lg	1
16	3702-291	Shaft, intermediate gear	1
17	3702-293	Gear sprocket	1
18	L800-083	Spirol pin, 3/16 in. dia x 1 1/4 in. lg	1
19	N200-198	Ballrace, RLS4	1
20	3702-294	Shaft, transfer	1
21	3702-214	Bracket, gear	1
22	3702-238	Clamp, sprocket	1
23	J202-013	Roller chain, simple, 3/8 in. pitch, 50 pitches (Fig 6.10)	1
24	J202-061	Chain, link, (connecting), 3/8 in. pitch	2
25	3702-295	Sprocket, small	1
26	L077-922	Screw, skt cap hd, 5/16 in. UNF x 1 in. lg	2
27	L601-109	Spring washer, 5/16 in	2
28	3702-309	Large drive plug	1
29	3702-902SP*	Cord, nylon braided	18 in.
30	3702-17	Large drive tube assembly	1
31	3702-370	Cord clamp	1

Fig 6.9 Fulmar Pedestal - Steering Assembly (Cont)

Item	Part No.	Nomenclature	Qty
32	L071-503	Screw, pan hd, 2-56 in. UNC x 3/16 in. lg	3
33	L800-035	Spirol pin, 3/32 in. dia x 5/8 in. lg	1
34	L800-050	Spirol pin, 1/8 in. dia x 5/8 in. lg	1
35	L100-007	Screw, 4BA, Vinten special	1
36	3419-230	Drive plug	1
37	3419-268	Steering buffer	1
38	J532-077	Spring	1
39	L701-010	External circlip, 1400-1/2 in.	1
40	3506-15	Shim	1
41	N200-003	Ballrace, KLNJ1/2 in.	2
42	3702-290	Housing, intermediate gear	1
43	L073-503	Screw, pan hd, 6-32 in. UNC x 3/8 in. lg	12
44	L076-921	Screw, skt cap hd, 1/4 in. UNF x 5/8 in. lg	4
45	3702-358	Shim, neoprene	A/R
46	3702-368	Shim, neoprene (thin)	A/R
47	3702-202	Fixed tube (Fig 6.5)	1
48	L701-019	External circlip, 1400-40	1
49	N200-408	Ballrace, T25	2
50	3702-289	Housing, transfer gear	1
51	3702-288	Transfer gear	1
52	3702-307	Drive bush	1
53	3328-391	Label, year of manufacture	1
54	3702-310	Tube bearing bush	1
55	N200-405	Ballrace, T21	1
56	3702-377	Bearing dust shield	1
57	L075-501	Screw, pan hd, 10-32 in. UNC x 3/8 in. lg	4
58	3702-203	Bottom tube (Fig 6.4)	1
59	3702-337	Tube bracket	1
60	L075-021	Screw, skt csk hd, 10-32 in. UNC x 1/2 in. lg	2
61	L800-029	Spirol pin, 3/32 in. dia x 5/8 in. lg	1

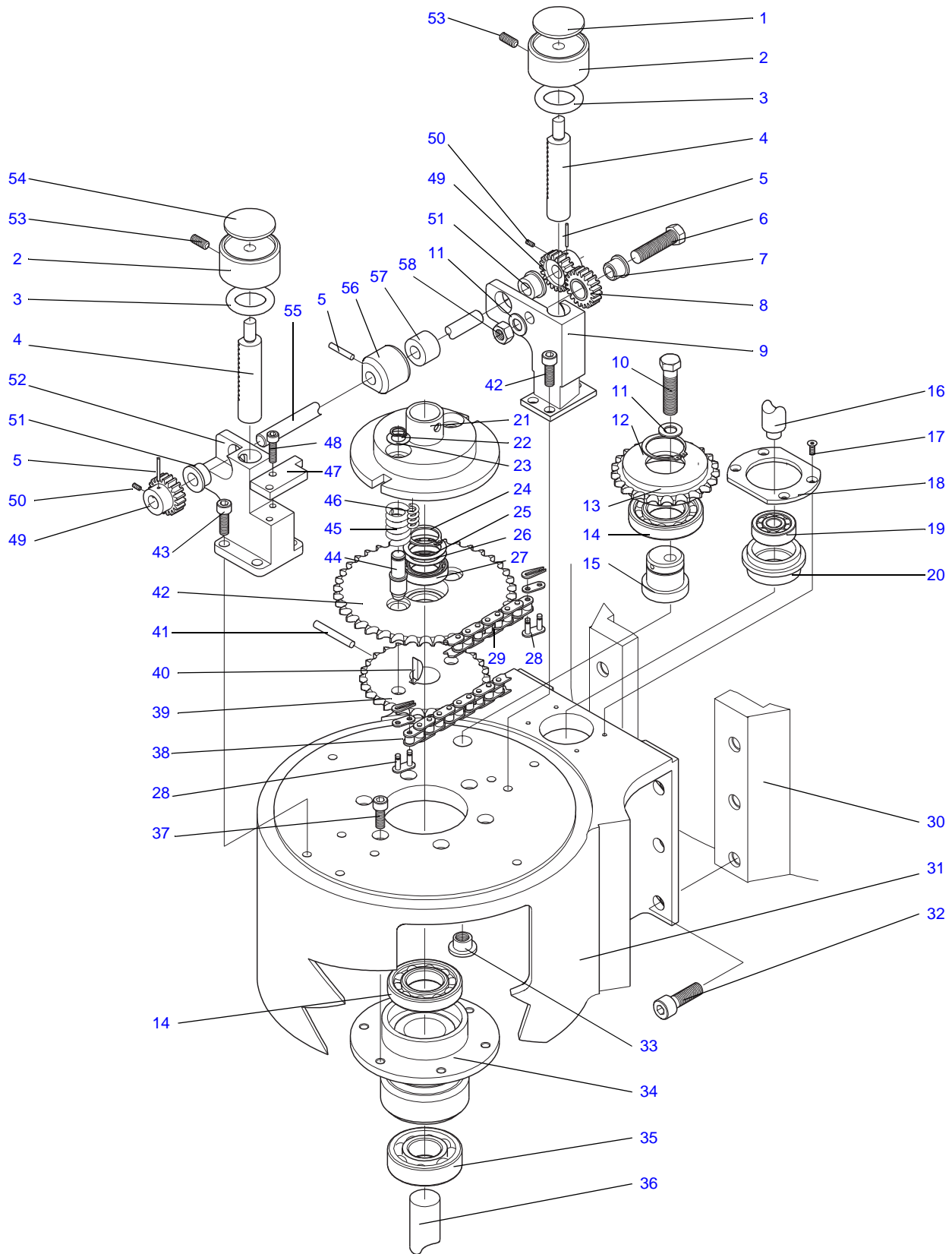


Fig 6.10 Fulmar Pedestal - Wheel Housing Assembly (Steering)

FULIP12

Fig 6.10 Fulmar Pedestal - Wheel Housing Assembly (Steering)

Item	Part No.	Nomenclature	Qty
1	3702-348	Steer label	1
2	3702-346	Pedal	2
3	Q900H007*	'O' ring, R4081, 1 1/16 in. OD x 13/16 in. ID	2
4	3702-345	Pedal shaft	2
5	L800-040	Spirol pin, 1/8 in. dia x 3/4 in. lg	3
6	L077-711	Bolt, hex hd, 5/16 in. UNF x 1 1/14 in. lg	1
7	3702-342	Flanged bearing	1
8	3702-341	Reverse gear	1
9	3702-338	Steering bearing bracket	1
10	L077-702	Bolt, hex hd, 5/16 in. UNF x 1 1/2 in. lg	1
11	L602-112	Washer, 5/16 in. UNF	2
12	L701-016	Circlip, external	1
13	3702-299	Adjusting sprocket, steering	1
14	N200-007	Bearing	2
15	3702-300	Shaft, eccentric	1
16	3702-294	Transfer shaft (Fig 6.9)	1
17	L073-011	Screw, csk hd, 6-32 in. UNF x 3/8 in. lg	4
18	3702-297	Bearing housing clamp	1
19	P206-001	Bearing, self-aligning	1
20	3702-296	Bearing housing, drive sprocket	1
21	3702-285	Clutch body	1
22	L701-007	Circlip, external	1
23	3419-111	Packing washer	A/R
24	M701-028	Circlip, external	1
25	3702-416	Shim, 0.005 in.	A/R
26	3702-417	Shim, 0.010 in.	A/R
27	N200-400	Bearing	1
28	J202-061	Chain, link, (connecting), 3/8 in. pitch	2
29	J202-012	Roller chain, 3/8 in. pitch, 307 pitches (Fig 6.11) (Fig 6.12)	1
30	3702-42	Pressure tank (Fig 6.6)	1
31	3702-209	Wheel housing (steering)	1

Fig 6.10 Fulmar Pedestal - Wheel Housing Assembly (Steering) (Cont)

Item	Part No.	Nomenclature	Qty
32	L078-908	Screw, skt cap hd, 3/8 in. UNF x 7/8 in. lg	6
33	3702-301	Tapped bush, eccentric	1
34	3556-2	Bearing housing	1
35	N200-202	Bearing	1
36	3702-376	Shaft, steering wheel (Fig 6.13)	1
37	L021-904	Screw, skt cap hd, 1/4 in. BSF x 1/2 in. lg	6
38	J202-013	Roller chain, 3/8 in. pitch, 50 pitches (Fig 6.9)	1
39	3702-284	Sprocket, fixed wheel	1
40	L805-010	Woodruff key No. 9	1
41	L800-079	Spirol pin, 3/16 in. dia x 1 3/8 in. lg	1
42	3702-281	Sprocket, steering wheel	1
43	L076-925	Screw, skt cap hd, 1/4 in. UNF x 1/2 in. lg	7
44	3702-383	Crab/steer pin	1
45	J532-042	Compression spring, Flexo 173206	1
46	J532-051	Compression spring, Flexo 103206	2
47	3702-347	Steering lock key	1
48	L075-921	Screw, skt cap hd, 10-32 in. UNF x 1/2 in. lg	2
49	3702-343	Changeover gear	2
50	L073-801	Grub screw, skt, 10-32 in. UNF x 1/4 in. lg	2
51	N002-013	Bearing, Oilite, FCT 396	2
52	3702-339	Crab bearing bracket	1
53	L075-802	Grub screw, skt, 10-32 in. UNF x 3/8 in. lg	2
54	3702-349	Crab label	1
55	3702-344	Changeover shaft	1
56	3702-286	Crab/steer cam	1
57	3702-362	Changeover buffer	1
58	L501-165	Nut, full, 5/16 in. UNF	1

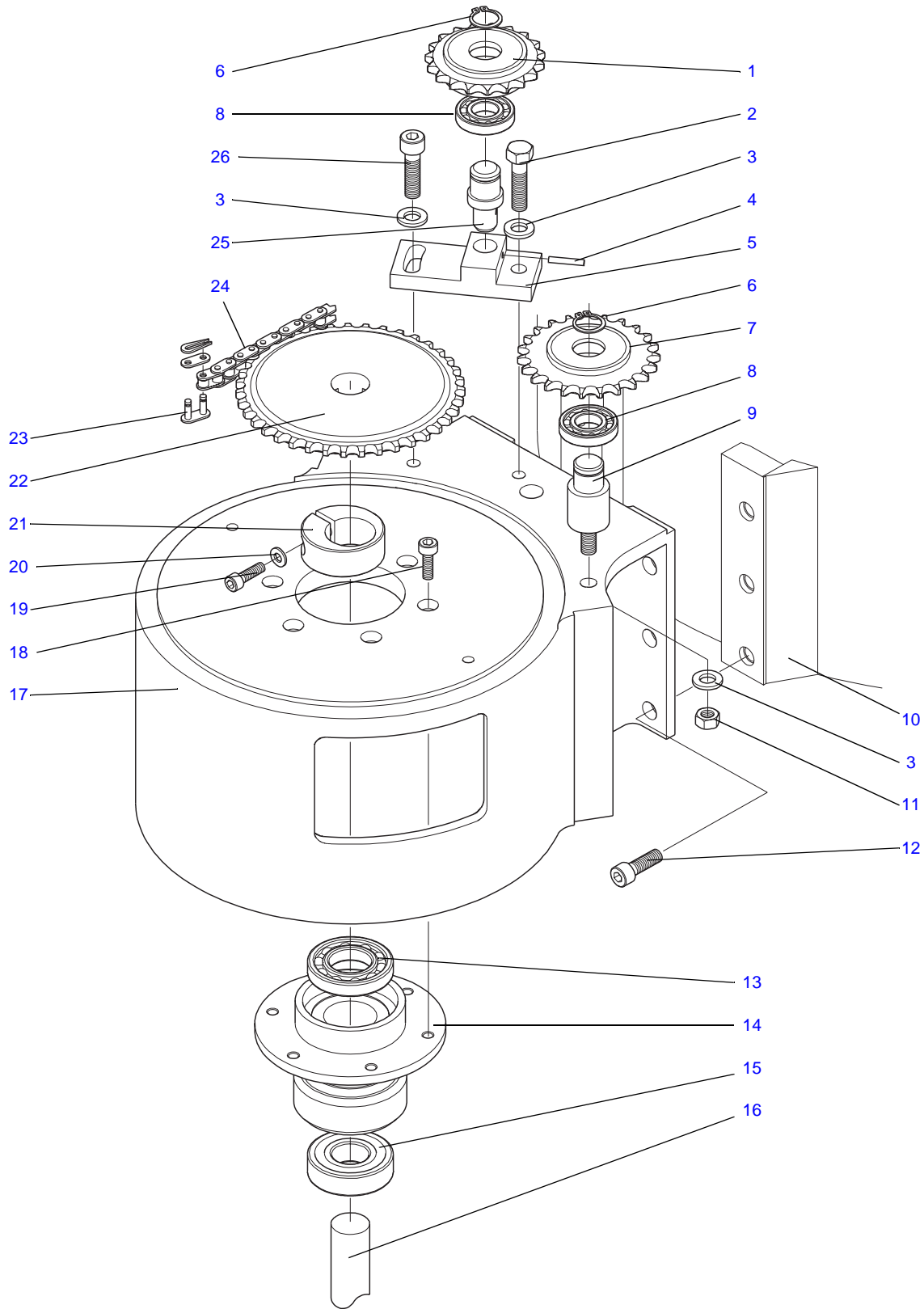


Fig 6.11 Fulmar Pedestal - Wheel Housing Assembly (Adjustable Sprocket)

FULIP13

Fig 6.11 Fulmar Pedestal - Wheel Housing Assembly (Adjustable Sprocket)

Item	Part No.	Nomenclature	Qty
1	3702-302	Sprocket, adjustable	1
2	L077-712	Bolt, hex hd, 5/16 in. UNF x 1 in. lg	1
3	L602-112	Washer, 5/16 in. UNF	3
4	L800-040	Spirol pin, 1/8 in. dia x 3/4 in. lg	1
5	3702-305	Adjuster, sprocket	1
6	L701-012	External circlip	2
7	3702-351	Guide sprocket	1
8	N200-004	Bearing	2
9	3702-303	Stub shaft, sprocket	1
10	3702-42	Pressure tank (Fig 6.6)	1
11	L501-165	Nut, full, 5/16 in. UNF	1
12	L078-908	Screw, skt cap hd, 3/8 in. UNF x 7/8 in. lg	6
13	N200-007	Bearing	1
14	3556-2	Bearing housing	1
15	N200-202	Bearing	1
16	3702-375	Shaft, fixed wheel (Fig 6.13)	1
17	3702-212	Wheel housing	1
18	L021-904	Screw, skt cap hd, 1/4 in. BSF x 1/2 in. lg	6
19	L076-923	Screw, skt cap hd, 1/4 in. UNF x 1 in. lg	1
20	L601-108	Spring washer, 1/4 in.	1
21	3702-236	Clamp, sprocket	1
22	3702-235	Sprocket, fixed wheel	1
23	J202-061	Chain, link, (connecting), 3/8 in. pitch	2
24	J202-012	Roller chain, 3/8 in. pitch, 307 pitches (Fig 6.10) (Fig 6.12)	1
25	3702-304	Stub shaft	1
26	L007-921	Screw, skt cap hd, 5/16 in. UNF x 7/8 in. lg	1

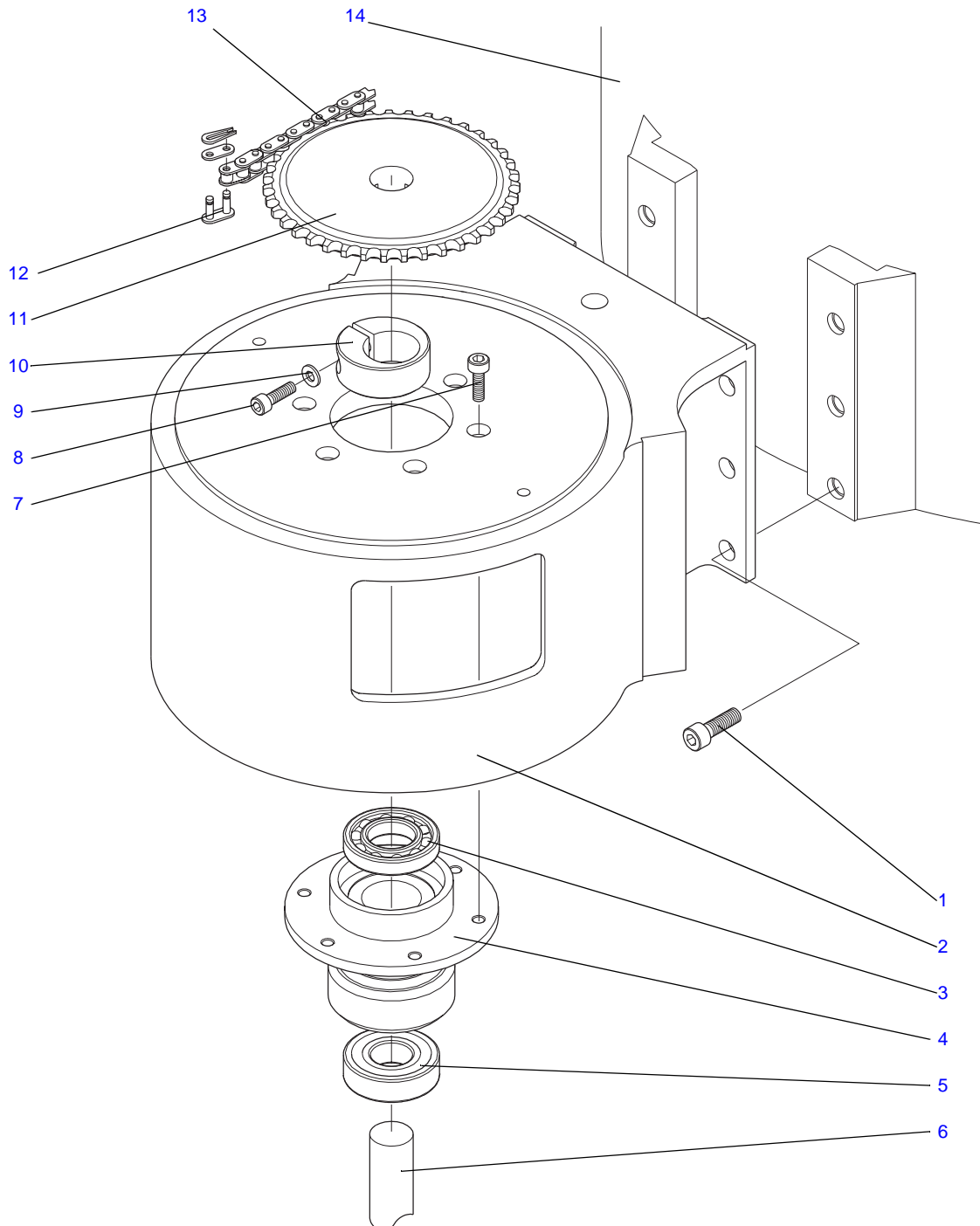
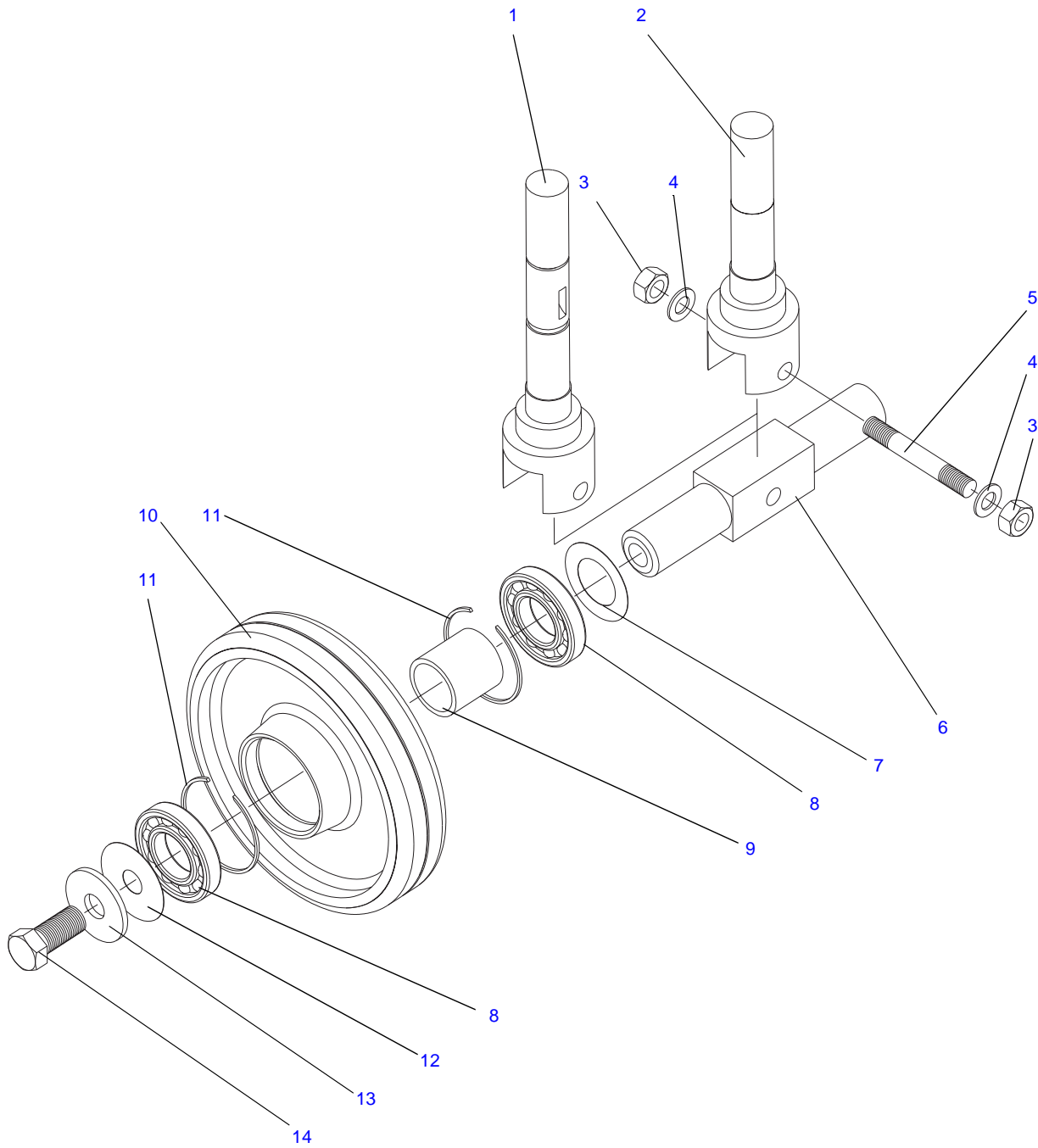


Fig 6.12 Fulmar Pedestal - Wheel Housing Assembly (Fixed)

Fig 6.12 Fulmar Pedestal - Wheel Housing Assembly (Fixed)

Item	Part No.	Nomenclature	Qty
1	L078-908	Screw, skt cap hd, 3/8 in. UNF x 7/8 in. lg	6
2	3702-212	Wheel housing	1
3	N200-007	Bearing	1
4	3556-2	Bearing housing	1
5	N200-202	Bearing	1
6	3702-375	Shaft, fixed wheel (Fig 6.13)	1
7	L021-904	Screw, skt cap hd, 1/4 in. BSF x 1/2 in. lg	6
8	L076-923	Screw, skt cap hd, 1/4 in. UNF x 1 in. lg	1
9	L601-108	Spring washer, 1/4 in.	1
10	3702-236	Clamp, sprocket	1
11	3702-235	Sprocket, fixed wheel	1
12	J202-061	Chain, link, (connecting), 3/8 in. pitch	2
13	J202-012	Roller chain, 3/8 in. pitch, 307 pitches (Fig 6.10) (Fig 6.11)	1
14	3702-42	Pressure tank (Fig 6.6)	1



FULIP10

Fig 6.13 Fulmar Pedestal - Wheel Assembly

Fig 6.13 Fulmar Pedestal - Wheel Assembly

Item	Part No.	Nomenclature	Qty
1	3702-376	Shaft, steering wheel (Fig 6.10)	1
2	3702-375	Shaft, fixed wheel (Fig 6.11)(Fig 6.12)	1
3	L501-191	Nut, full, 3/8 in. UNF	2
4	L601-263	Washer, Belleville	2
5	3702-371	Axle pivot	1
6	3702-239	Axle	1
7	3419-167	Packing shim, large	2
8	N200-007	Ballrace, Hoffman S10	4
9	3419-321	Wheel bearing spacer	2
	3419-100A	Wheel assembly, each comprising:	2
10	3419-274	Wheel	1
11	M700-025	Circlip, internal, 2 in. bore	2
12	3419-322	Outer wheel shim	2
13	3419-23	Outer wheel washer	2
14	L025-707	Bolt, hex hd, 1/2 in. BSF x 3/4 in. lg	2

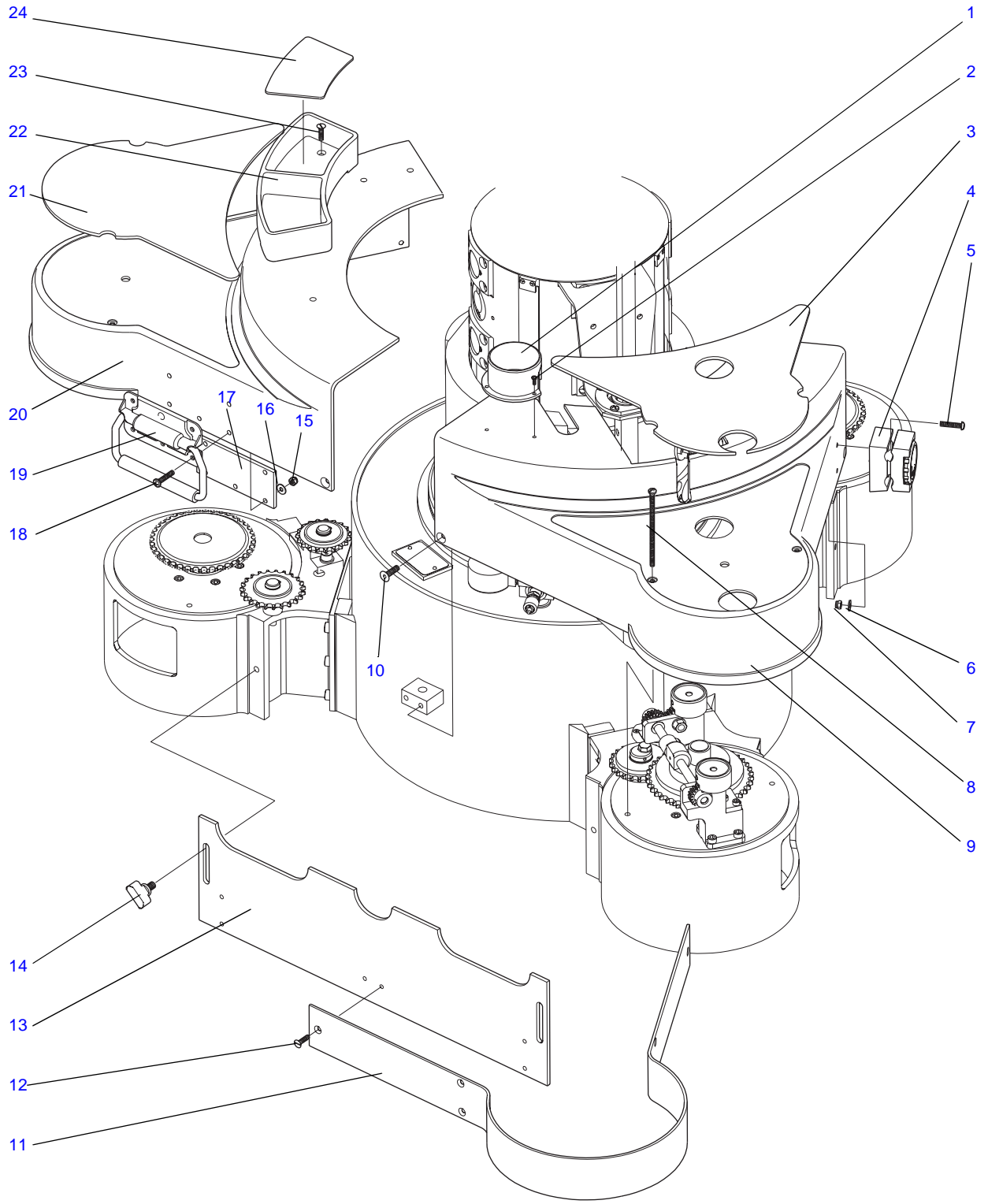


Fig 6.14 Fulmar Pedestal - Covers and Cable Guards

FULIP15

Fig 6.14 Fulmar Pedestal - Covers and Cable Guards

Item	Part No.	Nomenclature	Qty
1	3054-204	Pressure gauge guard	1
2	L073-503	Screw, pan head, slotted, 6-32UNC x 3/8 in. long	3
3	3702-318*	Rubber mat (mech.)	1
4	3382-11	Cable clamp	1
5	M006-503	Screw, button head, socket, M5 x 25 mm long	2
6	M600-006	Washer, plain, heavy, M5	2
7	M501-205	Nut, M5, nyloc, lock	2
8	L076-312	Screw, fillister head, slotted, 1/4-28UNF x 4 in. long	6
9	3702-210*	Mechanism cover	1
10	L076-009	Screw, countersunk head, socket, 1/4-28UNF x 5/8 in. long	6
11	3702-316	Cable guard	3
12	L075-027	Screw, countersunk head, socket, 10-32UNF x 3/8 in. long	18
13	3702-317	Cable guard plate	3
14	3419-400A	Thumb screw	6
	3702-905SP	Lifting handles kit, comprising	1
15	M501-008	Nut, M5, nyloc, full	30
16	M600-006	Washer, plain, heavy, M5	30
17	3702-458	Backing plate	6
18	M006-106	Screw, countersunk head, pozidrive, M5 x 20 mm long	30
19	J402-047	Handle, 98-651, MSZN	6
20	3702-211*	Chain cover	2
21	3702-319*	Rubber mat	2
22	3702-213	Weight box	2
23	L075-021	Screw, countersunk head, slotted, 10-32UNF x 1/2 in. long	4
24	3702-461	Weight storage lining / base	4
	3442-2	Mechanism housing (digital)	

Fig 6.15 Fulmar Pedestal - Composite Spare Parts

Part No.	Nomenclature	Qty
3702-900SP	Brake disc assembly, comprising:	
3702-323	Brake disc	1
3702-326	Brake pad	1
3702-901SP	Friction shaft assembly, comprising:	
3702-328	Friction shaft	1
3702-326	Brake pad	1
3702-902SP	Steering assembly - spares, comprising:	
Z200-029	Nylon braided cord, Austin's A quality, size 6A	18 in.
3702-903SP	3-strand pre-stretched Terylene cord, 1/4 in. dia, with crown knot	28 in
3702-904SP	3-strand pre-stretched Terylene cord, 1/4 in. dia, with crown knot	50 in.
3702-905SP	Lifting handle kit, comprising:	
M501-008	Nut, M5, nyloc, full	30
M600-006	Washer, plain, heavy, M5	30
3702-458	Backing plate	6
M006-106	Screw, countersunk head, pozidrive, M5 x 20 mm long	30
J402-047	Handle, 98-651, MSZN	6
3702-906SP	Seal kit, comprising	
Q001-014	'O' ring, 3/4 in. ID x 0.07 in. sect	3
Q001-016	'O' ring, 3/8 in. ID x 3/32 in. section	2
Q001-030	'O' ring, 7/8 in. OD x 3/32 in. sect	1
Q001-038	'O' ring, 5/16 in. ID x 3/32 in. sect	1
Q200-004	Bonded seal, Dowty PP-45-3	1
Q200-008	Bonded seal, Dowty PP-45-A	1
Q200-011	Bonded seal, Dowty PP-45-B	5
Q900H006	'O' ring, 3/4 in. ID x 3/32 in. sect	1
Q900H007	'O' ring, R4081, 1 1/16 in. OD x 13/16 in. ID	2

Fig 6.15 Fulmar Pedestal - Composite Spare Parts (Cont)

Part No.	Nomenclature	Qty
Q900H012	'O' ring, 1 7/8 in. ID x 1/8 in. sect	1
Q900H013	'O' ring, 1 1/2 in. ID x 1/8 in. sect	1
Q900H014	'O' ring, 2 in. ID x 1/8 in. sect	1
3702-910SP	Cover (mechanism) assembly, comprising:	
3702-210	Mechanism cover	1
3702-318	Rubber mat	1
3702-911SP	Cover (chain) assembly, comprising:	
3702-211	Chain cover	1
3702-319	Rubber mat	1