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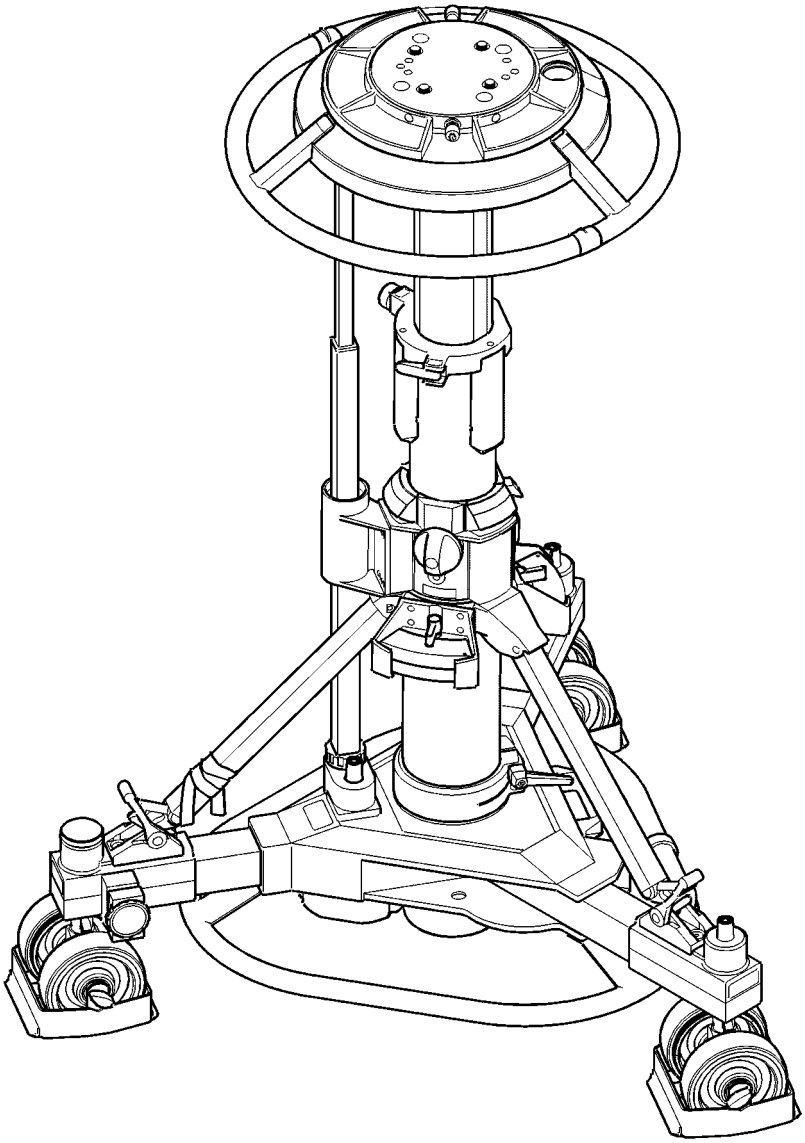
Maintenance Manual

Osprey *Plus*

Two-Stage Pedestal



Vinten

Camera Control Solutions

Osprey Plus

TWO-STAGE PEDESTAL
3328

MAINTENANCE MANUAL
AND
ILLUSTRATED PARTS LIST

PUBLICATION PART No. 3328-9

ISSUE 6

Foreword

This manual provides full and detailed information on the maintenance and spare parts for the Vinten® Osprey Plus two-stage pedestal, from Serial No. 1261 onwards. For pedestals with an earlier Serial No., please contact Vinten Broadcast Limited or your local distributor.

WARNING!: Read the Safety Section on page 8 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.

NOTE: Information contained in this document is subject to change.
Vinten Broadcast Ltd reserves the right, without notice, to make changes in equipment design or performance as progress in engineering, manufacturing or technology may warrant.

Notes to readers

This is the on-line version of ‘Osprey Plus Two-Stage Pedestal Maintenance Manual’ (3328-9). Readers should be aware that the pagination differs between on-line and printed versions.

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.

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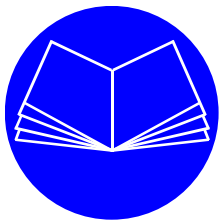
Safety - Read This First!

Warning symbols in this maintenance manual

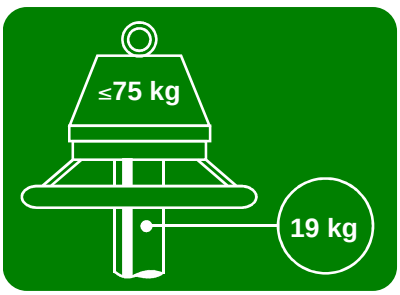
Where there is a risk of personal injury, injury to others, or damage to the pedestal or associated equipment, comments appear, highlighted by the word **WARNING!** and supported by the warning triangle symbol.

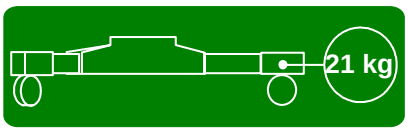
Warning symbols on the pedestal

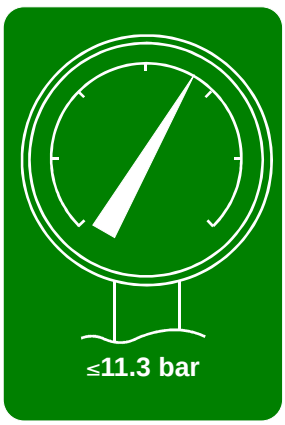


On encountering the warning triangle and open book symbols it is imperative that you consult this maintenance manual before using this pedestal or attempting any adjustment or repair.

Critical data







Mass

Column (including steering ring)	**19 kg**	**(42 lb)**
Skid (including kickbar)	**21 kg**	**(46.2 lb)**
Trim weights (total)	**3 kg**	**(6.6 lb)**

Load

Maximum Load	**75 kg**	**(165 lb)**

Pressure

Maximum Pressure	**11.3 bar**	**(165 psi)**

Abbreviations

The following abbreviations are used in this publication:

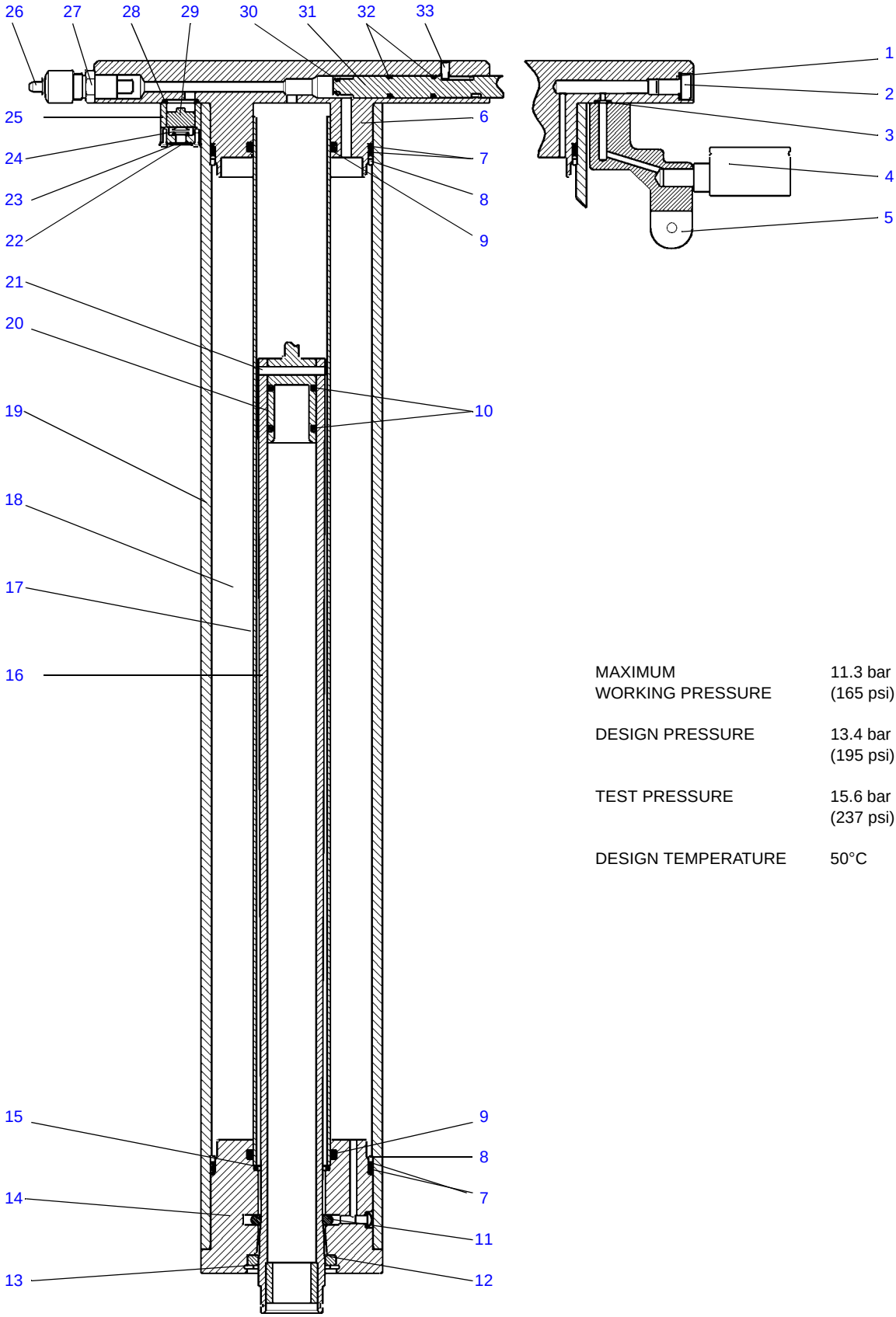
ac	alternating current	lb	pound (weight)
A	Amps	LF	Lubricated Friction
AF	across flats	LH	left hand
A/R	as required	MISO	metric thread
ASME	American Society of Mech Engineers	m	metre
assy	assembly	mm	millimetre
BS	British Standard	N	Newton
BA	British Association thread	NPT	National Pipe thread
BSF	British 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.

	STUDIO	OB
Weight		
Column	24.5 kg (54 lb)	24.5 kg (54 lb)
Skid	21 kg (47 lb)	21 kg (47 lb)
Trim weights	3 kg (6.6 lb)	3 kg (6.6 lb)
Total pedestal weight	42.5 kg (93.5 lb)	42.5 kg (93.5 lb)
Overall Dimensions		
Minimum height	66 cm (26 in.)	69.5 cm (27.3 in.)
Maximum height	143 cm (56.3 in.)	146.5 cm (57.6 in.)
On-shot stroke	77 cm (30 in.)	77 cm (30 in.)
Doorway width		
Tracking width	97 cm (38 in.)	97 cm (38 in.)
Transit width	86 cm (34 in.)	86 cm (34 in.)
Narrow tracking width	70 cm (27.5 in.)	70 cm (27.5 in.)
Skid leg radius	48 cm (19 in.)	48 cm (19 in.)
Wheel diameter	12.5 cm (5 in.)	16 cm (6.3 in.)
Payload	75 kg (165 lb)	75 kg (165 lb)
Pneumatic system		
Maximum working pressure	11.3 bar (165 psi)	11.3 bar (165 psi)
Relief valve pressure	13.4 bar (195 psi)	13.4 bar (195 psi)
Design pressure	13.4 bar (195 psi)	13.4 bar (195 psi)
Test pressure	15.6 bar (237 psi)	15.6 bar (237 psi)

Tank Assembly (Part No. 3328-40)



MAXIMUM WORKING PRESSURE	11.3 bar (165 psi)
DESIGN PRESSURE	13.4 bar (195 psi)
TEST PRESSURE	15.6 bar (237 psi)
DESIGN TEMPERATURE	50°C

Tank Assembly (Part No. 3328-40)

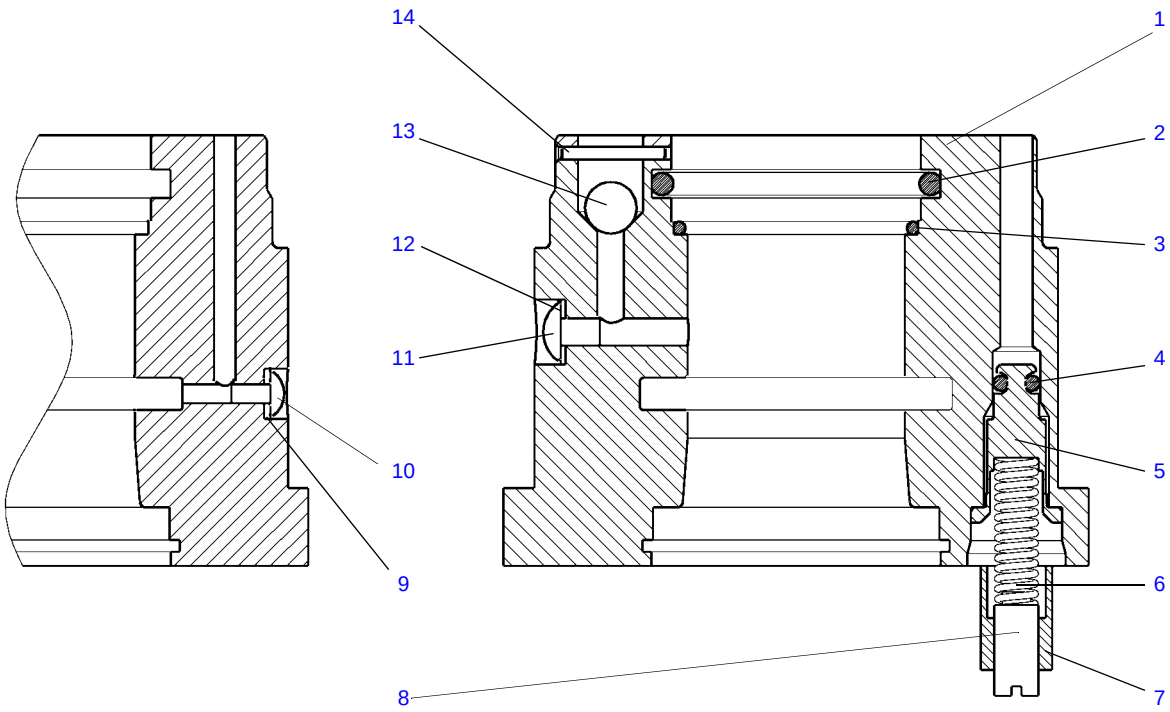
Item	Name	Qty	Material
1	Sealing ring, secured with:	1	Nylite nylon L29
	Loctite primer T	A/R	
	Loctite 542	A/R	
2	Screw, lp skt hd, M8 x 12 mm lg, secured with:	1	HT steel, de-embrittled, zinc and black passivated
	Loctite primer T	A/R	
	Loctite 542	A/R	
3	'O' ring	1	Medium nitrile rubber
4	Gauge assembly	1	
5	Catch bracket	1	Al alloy, LM4TF
6	Tank top plate	1	Al alloy, 2030 BS4300/5
7	'O' ring	4	Medium nitrile rubber
8	'O' ring support disc, tank	2	Al alloy, 6882 T6 BS1474
9	'O' ring	2	Medium nitrile rubber
10	'O' ring	2	Medium nitrile rubber
11	'O' ring	1	Medium nitrile rubber
12	Guide bush	1	Ultraware
13	Spirol ring	1	
14	Pressure relief valve assembly	1	See overleaf
15	'O' ring	1	Medium nitrile rubber
16	Tapered ram	1	Al alloy, 6082 T6 BS1474*
17	Guide tube	1	Al alloy, 6063 T832 BS1471*
18	Filler, tube	1	Explosafe Al mesh, Ref 454A
19	Tank tube	1	Al alloy, 6082 T7 BS1471 *
20	Tapered ram bung, secured with:	1	Stainless steel EN56 AMR BS970
21	Spirol pin	2	Nickel stainless steel
	Activator, permabond A905	A/R	
	Adhesive, Permabond F200	A/R	
22	Inlet valve filter	1	Stainless steel woven wire
23	Inlet valve cover	1	Al alloy, HS30 TF BS1470
24	Valve seal, 'V' ring	1	

*Material fully certified and covered by mechanical and chemical certificates

Tank Assembly (Part No. 3328-40) (Cont)

Item	Name	Qty	Material
25	Inlet valve housing	1	Al alloy, HS30 TF BS1470
26	Pressure release button	1	Brass BS249 CZ121
27	Schrader valve, secured with:	1	Schrader 9886, core 2300T
	Loctite primer T	A/R	
	Loctite 542	A/R	
28	‘O’ ring	1	Medium nitrile rubber
29	Inlet valve	1	Stainless steel EN58 AM BS970
30	‘O’ ring	1	Medium nitrile rubber
31	Valve switchover shaft	1	Stainless steel EN58 AM BS970
32	‘O’ ring	1	Medium nitrile rubber
33	Grub screw, secured with:	1	HT steel, zinc and black passivate
	Loctite 222E	A/R	

Relief Valve Assembly (3328-38)



Relief Valve Assembly (3328-38)

ITEM	NAME	QTY	MATERIAL
1	Tank end plug	1	Al alloy 6082 T6 BS1474
2	'O' ring, lubricated with:	1	Medium nitrile rubber
	Bearing grease	A/R	
3	'O' ring, secured with:	1	Medium nitrile rubber
	Loctite 409	A/R	
4	'O' ring, lubricated with:	1	Medium nitrile rubber
	Bearing grease	A/R	
5	Relief valve piston	1	Stainless steel, BS 970 303 S41
6	Spring	1	
7	Relief valve spring retainer, secured with:	1	All alloy FC. I. BS4300/5
	Loctite 221	A/R	
	Screw, skt cap hd, M3 x 16 mm lg	2	Mild steel, cadmium plated and passivated
8	Tapped grub screw, secured after setting with:	1	Mild steel
	Loctite primer T	A/R	
	Loctite 270	A/R	
9	Screw, skt butt hd, M4 x 5 mm lg	1	
10	Sealing ring	1	Nylite L49
11	Screw, skt butt hd, M5 x 6 mm lg	1	
12	Sealing ring	1	Nylite L49
13	Precision rubber ball	1	
14	Spirol pin, 2 mm dia x 16 mm lg	1	

Design Improvements

Details	Serial No. Information
Introduction of Osprey Plus	From Serial No. 685
CE mark and graphic warning labels	From Serial No. 1000
Improved tank, steering ring and mounting	From Serial No. 1261
Improvements to track rollers and shafts	From Serial No. 1246
Improvements to steering gear to reduce wear and eliminate vertical movement	From Serial No. 1324

Section 1

Introduction and Description

Contents **Para**

Introduction

1 The Osprey Plus two-stage pedestal is a fully portable pneumatic camera mount with self-contained pump, designed to support a payload of up to 75 kg (165 lb).

2 The pedestal has a central two-stage telescopic column, supported on a skid assembly with steered wheels. To facilitate transport, the steering ring may be removed, the telescopic column and skid separated and the skid folded.

3 Elevation of the bottom stage is assisted by a gas strut located within the column. To provide a suitable degree of assistance for various column loads, four versions of the gas strut are available, each designed to operate over a particular load range (Table 1.1 Gas Strut Ranges).

4 The top stage has a pressure-to-load ratio of approximately 1.26 bar /10 kg (10 psi/13 lb) and may be pressurized manually, using the self-contained pump, or from an external pressure source.

5 The pedestal is equipped with a relief valve to prevent an excessive build-up of pneumatic pressure and with a safety catch to prevent accidental operation of the telescopic column. The pressure relief valve operates at the predetermined level and automatically resets at a predetermined level below this.

Load Range	Strut Force	Part No.
0-18 kg (0-40 lb)	270 N	3328-307
18-32 kg (40-70 lb)	360 N	3328-306
32-55 kg (70-120 lb)	450 N	3328-305
55-75 kg (120-165 lb)	450 N	3328-385

Table 1.1 Gas Strut Ranges

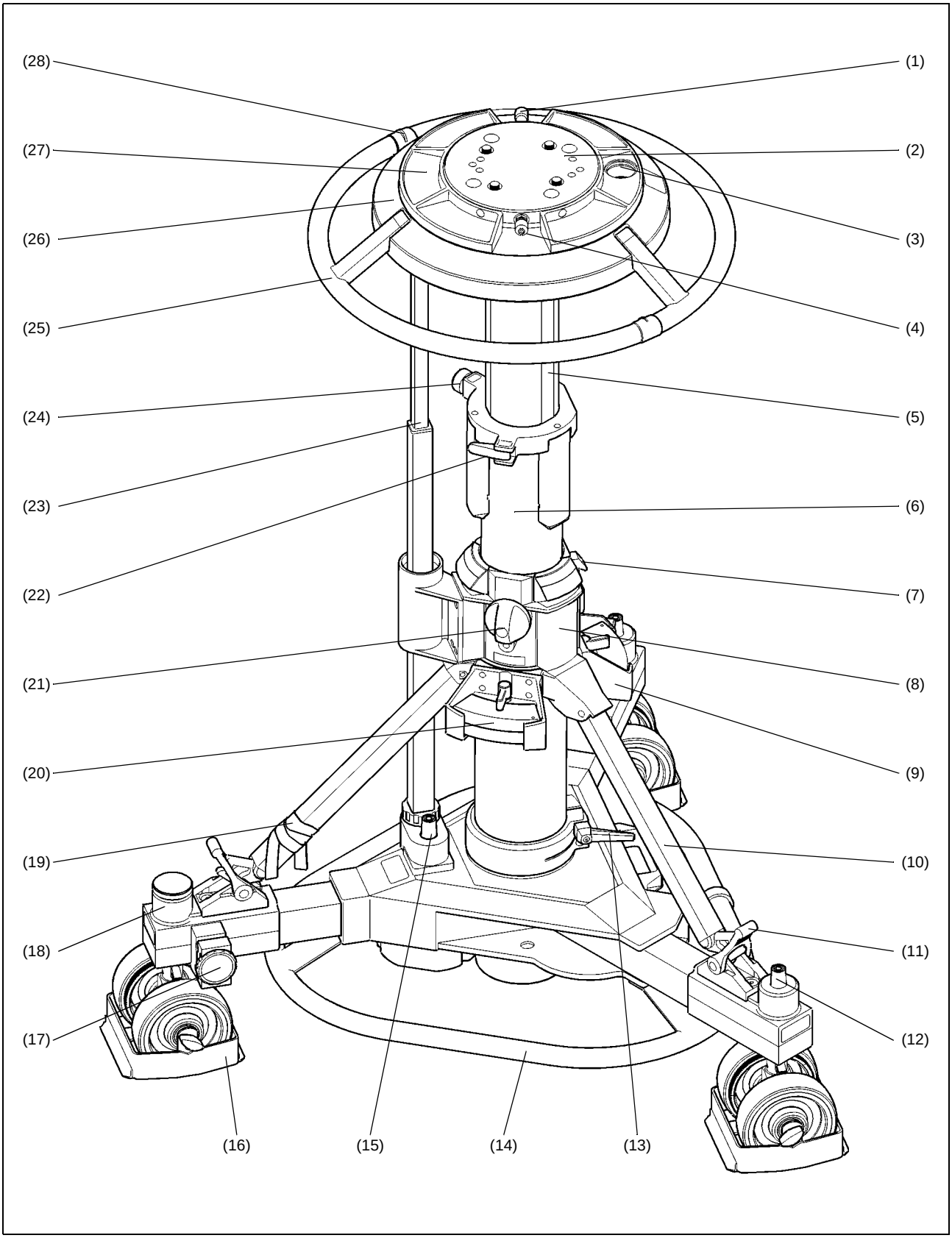


Fig 1.1 Osprey Plus two-stage pedestal

Description

6 The pedestal consists of two main assemblies:

6.1 A skid assembly

6.2 A two-stage column

Skid assembly

7 The skid assembly comprises a centre casting, three equispaced skid legs, three twin wheels and a kickbar. The bottom stage of the telescopic column is secured to the centre casting by a retaining clamp (13). The centre casting also contains the skid steering mechanism, together with a crab/steer changeover control (15). Two of the legs may be folded for transportation and extended to either full or to “narrow doorway” tracking. Interchangeable twin wheels - 125 mm (5 in.) diameter, fitted with cable guards (16) for studio use or 160 mm (6.3 in.) diameter for outside broadcast (OB) use - are installed on each foot support, with brakes (12) on the folding legs and a tiller socket (18) on the fixed leg. A continuous chain connects the steering mechanism to each leg, with further chains in each leg to connect the wheels. Clutches in each wheel unit disconnect the steering in the event of the wheel striking an obstacle. A rubber strap on each foot support (9) secures the bottom stage struts (10). A cable clamp (17) is provided on the fixed leg. A kickbar (14) is retained on the underside of the centre casting by three sliding catches.

Two-stage column

8 The two-stage column consists of:

8.1 An outer tube

8.2 A bottom stage comprising an elevation tube

8.3 A top stage comprising a tank assembly

Outer tube

9 The outer tube (8) supports the bottom stage of the two-stage column. Its lower end is closed by an end plate and plug and fits in the centre casting of the skid assembly, where it is secured by the skid clamp (13). A top housing assembly is fitted to its upper end.

10 The top housing has three equispaced pivots for the bottom stage struts (10), which engage with foot supports (11) on the skid assembly and are secured with rubber straps to give the pedestal its strength and stability. The pedestal is supplied with a captive strap (19) to secure the struts to the outer tube during transportation and storage. A clamp (21) in the top housing secures the elevation tube in position, a catch (7) engages with the safety latch on the tank tube and three pockets (9) are provided for trim weights when not in use.

Elevation tube

11 The elevation tube (6) forms the lower stage of the two-stage column and the positioning of this tube, relative to the outer tube, broadly defines the working height of the pedestal. Once set at the required height the elevation tube is secured by the clamp (20) on the outer tube.

12 The upper end of the elevation tube is fitted with three sets of rollers, which guide the tank assembly, an adjustable drag pad (24) and an on-shot clamp (22), which secures the tank assembly in position. The lower

end is closed by an end plate. A pressurized gas strut is installed in the elevation tube, between a plug in the outer tube lower end plate and the top of the tank assembly ram.

Tank assembly

13 The tank assembly (5) forms the upper stage of the two-stage column and provides the pneumatic counterbalancing force. It consists of a tank tube, a top plate, a relief valve assembly and a pressurization mechanism. An aluminium mesh tank filler is installed in the tank assembly to improve temperature stability of the top stage.

14 The tank tube has three equispaced longitudinal tracks on its outer wall which engage with rollers in the elevation tube to guide the tank assembly and prevent rotational movement.

15 The top plate, which closes the top of the tank tube, contains a Schrader valve (4), which allows for external charging and pressure release, a 0-13.5 bar (0-200 psi) pressure gauge (3), an inlet valve and a control valve (1). Attached to the top plate are a safety latch, which engages with the catch (7) on the bottom tube top housing, a removable steering ring (25) and two trim weight trays (27). The upper end of the pressurization mechanism is retained in the top plate.

16 The relief valve assembly closes the bottom of the tank tube and acts as a guide for the bottom end of the pressurization mechanism. It contains a lower inlet valve and a pressure relief valve.

17 The pressurization mechanism comprises a guide tube retained in the tank tube between the top plate and the relief valve assembly, and a hollow ram, which is free to slide in the guide tube and is secured at its lower end to the elevation tube bottom end plate.

Steering mechanism

18 The steering mechanism comprises a steering gear, which is free to rotate on four rollers attached to the underside of the tank assembly top plate; a steering ring mounting plate (26) secured to the steering gear and a steering ring (25), secured to the steering ring mounting plate by three screws.

19 Two steering indicators (28) are used to indicate the straight-ahead position and provide a reference point when steering.

20 The steering gear is connected by a toothed belt to a pulley at the top end of the telescopic steering column (23). The lower end of the telescopic steering column engages with the crab/steer changeover mechanism in the skid (15).

21 A steering tiller may be fitted to the fixed skid leg to provide an alternative means of steering, for example, when using a tripod in place of the column.

Section 2

Operation

Contents Para

Introduction

1 This section includes instructions for assembling the Osprey Plus pedestal, pressurizing the pedestal fitting and balancing the payload and transportation and storage. Refer to Fig 1.1 to identify the parts. For further operating instructions, please refer to Osprey Plus Two-Stage Pedestal Operators Guide, Publication Part No. 3328-8.

Operation

Assembling the pedestal

2 Assemble the pedestal as follows:

2.1 Turn the skid upside-down, depress the leg locking plungers and swing each folding leg out until the plungers lock the legs in the fully open position.

2.2 Fit the kickbar (14), which is secured by three sliding catches on the underside of the centre casting.

2.3 Set the skid on the ground on its wheels and apply the brakes (12).

2.4 Fit the steering ring (25) to the column as follows:

2.4.1 Position the steering ring (25) in the cut-outs of the mounting plate (26).

2.4.2 From the underside of the mounting plate, tighten the three screws using a suitable screwdriver, coin, or similar tool.

2.5 Install the column on the skid as follows:

2.5.1 Ensure that the rubber straps on each foot support (11) are to the outside of the ball joint.

2.5.2 Hold the column upright and release the Velcro retaining strap (19) holding the three struts (10). Raise the longer strut to about 30° from horizontal. The strut joint is adjusted to retain the strut in this position.

2.5.3 Lift the column, holding the two shorter struts out from the column. Align the long strut with the fixed leg of the skid and carefully lower the column base into the skid centre. Ensure that the struts engage with the ball joints on each foot support and the steering tube locates in its socket.

2.5.4 Secure the struts to the supports with the rubber straps (11).

2.5.5 Tighten the skid clamp (13), using moderate hand pressure only. The clamp lever has a spring-loaded ratchet-type action and is operated as follows:

2.5.5.1 Turn the clamp lever clockwise as far as possible.

2.5.5.2 Pull the lever outward against the spring pressure, return it to vertical and release.

2.5.5.3 Turn lever clockwise again.

2.5.5.4 Repeat until the skid clamp is sufficiently tightened.

2.5.6 Secure the Velcro retaining strap (19) clear of the skid wheels.

2.5.7 Slide the steering indicator(s) (28) to the desired position.

3 If the pedestal is already pressurized, the load may now be fitted. Otherwise pressurize the pedestal before fitting the load.

Pressurizing the pedestal

4 The Osprey Plus pedestal may be pressurized manually, by using the self-contained pump; or from an external pressure source, or by using the Vinten portable pump (Part No. 3357-3).

5 A correctly pressurized pedestal will balance its payload such that it can be moved to any position over the full on-shot stroke of the moving column, with minimum effort, and it will maintain its position when the steering ring is released. Balance is achieved with approximately 1.26 bar pressure for every 10 kg of load (10 psi for every 13 lb).

Pressurizing the pedestal manually

WARNING!: Do not pressurize the pedestal beyond the maximum safe working pressure indicated by the leading edge of the red sector on the gauge. The pedestal is fitted with a pressure relief valve as a safeguard against over- pressurization.
Do not attempt to adjust the pressure relief valve.

6 To pressurize the pedestal manually, proceed as follows:

6.1 Fit the steering ring (25).

6.2 Set the control valve (1) to the PUMP position.

WARNING!: Bottom stage elevation is assisted by a gas strut. The bottom stage will rise rapidly if released with no payload fitted. Do not lean over the pedestal when releasing the safety catch and/or the bottom clamp.
A pressurized pedestal will rise rapidly when safety catch is released. Do not release safety catch when pedestal is pressurized and balancing load is not installed. Always restrain the pedestal by hand pressure on the steering ring when the safety catch is released.

6.3 Ensure that the bottom stage (6) is fully lowered and the red bottom clamp (21) is applied. Push down on the steering ring (25) against any residual pressure and release the safety catch (7).

6.4 Move the slide (7) to the OFF position (O).

6.5 Using the steering ring, raise the top stage (5) until fully extended. Commence pumping by lowering and raising the top stage over the upper half of its travel. When the pressure gauge (3) begins to register, pump the top stage over its full stroke. Stop pumping when maximum working pressure is reached (indicated by the leading edge of the red sector on the gauge) during the pumping stroke

WARNING!: A pressurized pedestal will rise rapidly if the control valve is set to WORK. Do not move the control valve directly from PUMP to WORK.

6.6 Set the control valve (1) to the INTERMEDIATE position and allow the top stage to rise fully.

6.7 Set the control valve (1) to the WORK position.

6.8 Install the camera mount and payload and balance the load as described below.

Pressurizing the pedestal from an external pressure source

WARNING!: This pedestal must be pressurized only with clean, dry air or nitrogen. A pressure reducing valve must be fitted to the pressure line between the gas cylinder and the outlet connection of the hose. The reducing valve must be screwed into the gas cylinder outlet. The maximum pressure on the outlet side of the reducing valve must not exceed 11.3 bar (165 psi). Do not pressurize the pedestal beyond the maximum safe working pressure indicated by the leading edge of the red sector on the gauge. The pedestal is fitted with a pressure relief valve as a safeguard against over- pressurization.
Do not attempt to adjust the pressure relief valve.

7 To pressurize the pedestal from an external pressure source, proceed as follows:

7.1 Fit the steering ring (25).

7.2 Set the control valve (1) to the WORK position.

WARNING!: A pressurized pedestal will rise rapidly when safety catch is released. Do not release safety catch when pedestal is pressurized and balancing load is not installed. Always restrain the pedestal by hand pressure on the steering ring when the safety catch is released.

7.3 Push down on the steering ring (25) against any residual pressure and release the safety catch (7).

7.4 Move the slide (7) to the OFF (O) position.

7.5 Remove the Schrader valve cap (4) and connect the charging line from the pressure source.

7.6 Turn on the pressure supply and slowly increase the pedestal pressure. If not already fully extended, the top stage (5) will rise. Shut off the supply when maximum working pressure is reached, indicated by the leading edge of the red sector on the gauge (3).

7.7 Disconnect the charging line, but do not refit the Schrader valve cap at this stage.

7.8 Install the camera mount and payload and balance the load.

Pressurizing the pedestal using the Vinten portable pump

WARNING!: Do not pressurize the pedestal beyond the maximum safe working pressure indicated by the leading edge of the red sector on the gauge. The pedestal is fitted with a pressure relief valve as a safeguard against over-pressurization.
Do not attempt to adjust the pressure relief valve.

8 To pressurize the pedestal using the Vinten portable pump, proceed as follows:

8.1 Fit the steering ring (25).

WARNING!: A pressurized pedestal will rise rapidly when safety catch is released. Do not release safety catch when pedestal is pressurized and balancing load is not installed. Always restrain the pedestal by hand pressure on the steering ring when the safety catch is released.

8.2 Push down on the steering ring (25) against any residual pressure and release the safety catch (7).

8.3 Move the slide (7) to the OFF (O) position.

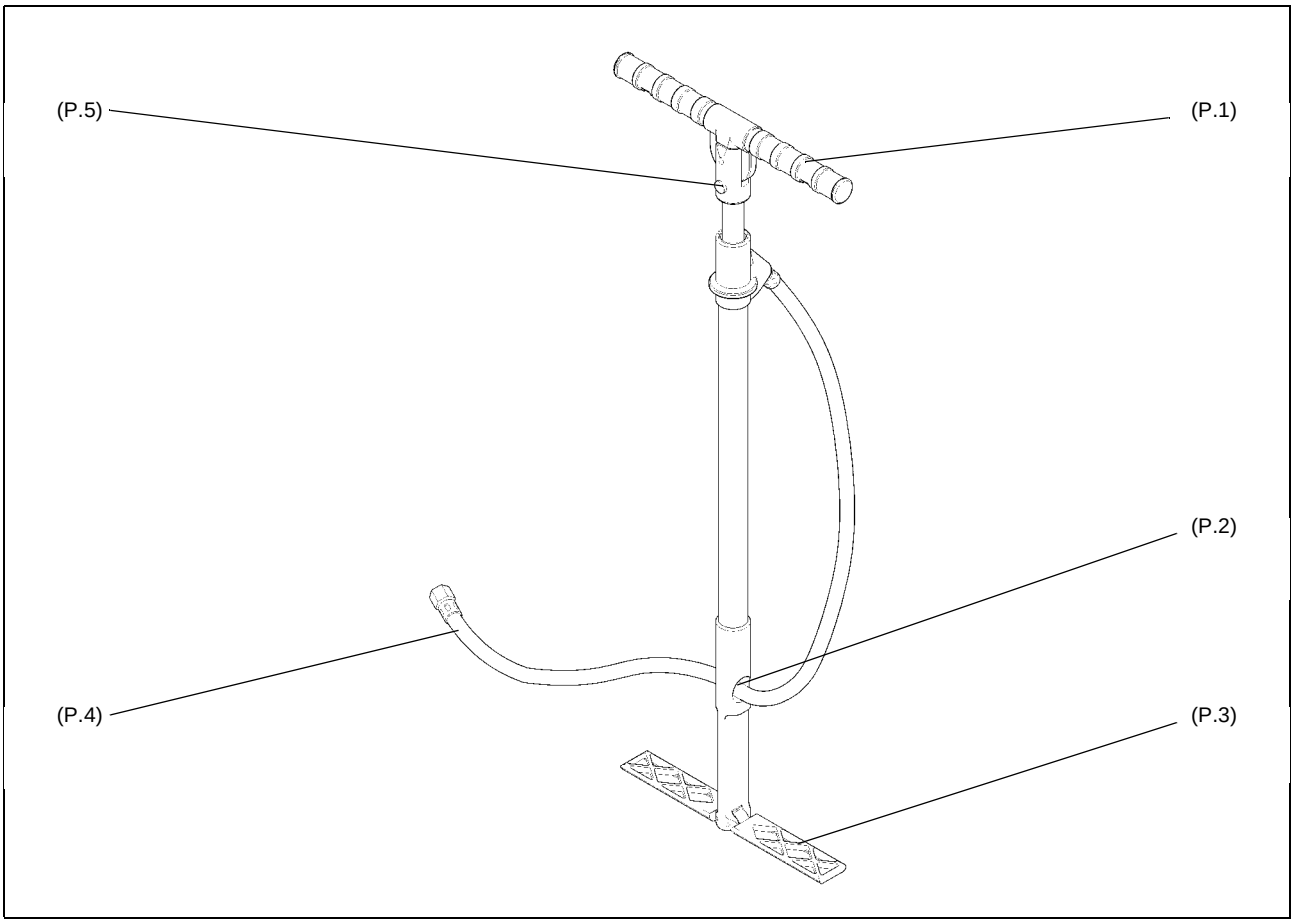


Fig 2.1 The Vinten portable pump

8.4 On the pump, fold down both the feet (P.3).

8.5 Push in the handle release button (P.5) and move the handle (P.1) to the horizontal position, where it will lock.

8.6 Pull the hose (P.4) out of its stowage (P.2). Connect the hose to the pedestal charging valve (4).

8.7 Position the pump between the legs, standing with both feet on the fold-down feet (P.3).

8.8 Grip the handle (P.1) with both hands and, using full steady strokes, pressurize the pedestal to the required pressure. Do not exceed the maximum working pressure, indicated by the leading edge of the red sector on the gauge (3).

8.9 Disconnect the hose (P.4) from the pedestal charging valve (4), but do not refit the Schrader valve cap at this stage. Fit the hose in its stowage (P.2).

8.10 Push the pump plunger fully down, push in the handle release button (P.5) and move the handle (P.1) to the vertical position, where it will lock the pump plunger in the closed position.

8.11 Fold up both the feet (P.2).

Fitting and balancing the load

9 After pressurization of the pedestal, the camera mounting and payload can be fitted and balanced. The Osprey Plus pedestal has the standard four-bolt mounting plate (2) which permits the use of various Vinten camera mounts including pan and tilt heads, Quickfix® and Mitchell adapters. The mounting bolts are captive in the pedestal and the bolt heads are accessible from the underside of the mounting plate. When the camera mount has been fitted, the bolts should be tightened securely using a flat-bladed screwdriver or a spanner of the correct size. A Vinten spanner, Part No. J551-001, is available for this purpose.

10 When the camera mount has been secured proceed as follows:

10.1 Fit the payload to the fully-extended top stage of the pedestal, ensuring that all items such as pan bars, prompters, lenses etc, are fitted. Attaching these items at a later stage may upset the pedestal balance. Install three trim weights (20) on the weight tray (27).

10.2 Using the Schrader valve cap (4), carefully reduce the pressure in steps of 0.15-0.20 bar (2-3 psi) until the payload is correctly balanced. A correctly pressurized pedestal will balance its payload such that it may be moved to any position over the full on-shot stroke with minimum effort and will maintain its position when the steering ring is released.

10.3 Fine balance may be achieved by adding or removing trim weights.

Transportation and storage

WARNING!: Ensure that the payload is removed and trim weights are secured in the trim weight stowage before dismantling the pedestal.
Local, national or international regulations may apply to the transport and storage or pressurized pedestals.

NOTE: It is not necessary to reduce the pedestal pressure prior to transportation or storage. To avoid the possibility of dust or abrasive particles collecting on moving components, set the column to minimum height.

11 The pedestal may be dismantled for transportation and storage. Proceed as follows:

11.1 Apply the brakes (12).

11.2 Set the control valve (1) to the WORK position.

11.3 Lower the top stage (5), then set the control valve to PUMP.

11.4 Remove the load and secure any trim weights (20) in the trim weight stowage (9).

11.5 Set the safety catch slide (7) to ON (I) and fully depress both columns until the safety catch engages.

11.6 Release the skid clamp (13).

11.7 Release the three rubber foot straps (11) from the struts (10).

11.8 Raise the longer strut (on the fixed skid leg), which will remain raised when released. Raise and hold the two shorter struts, then lift the complete column vertically off the skid.

11.9 Secure the struts with the Velcro strap (19).

WARNING!: The column will be unstable if stood on its base.

11.10 Remove the steering ring (25) by unscrewing each fastener until it releases. Lift the steering ring off its mounting plate (26).

11.11 Remove the kickbar (14) from the skid by releasing the sliding catches

11.12 Depress the locking plungers and fold the skid legs, ensuring that the plungers lock in the fully closed position

Section 3

Tools and Materials

Special tools

1 No special tools are required

Consumable materials

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

Item	Part No.	Use
Grease Molykote 111	Z150-096	Drag clamp pad
Grease GP50	Z150-081	Crab/steer changeover mechanism
Grease white bearing	Z150-085	Clamps steering and brake mechanisms
Loctite 221	Z002-026	Screw locking
Loctite 222E	Z002-075	Screw locking
Loctite 380	Z002-078	Clamp pad
Loctite 409	Z002-076	Adhesive
Loctite 415	Z002-062	Adhesive
Loctite 542	Z002-025	Sealant
Loctite 601	Z002-020	Adhesive
Loctite Primer T	Z002-019	Primer for 542
Loctite Primer 757	Z002-087	Primer for 406
Loctite Prism 406	Z002-086	Screw locking adhesive
Lubricant chain	Z150-050	Steering chains
Paint Nimbus Grey		Screw heads
Silcoset 153	Z002-036	Control valve knob and steering gear perspex disc

Section 4

Servicing

Contents Para

General

1 The Osprey Pedestal is robustly made to high engineering standards. Therefore little attention is required to maintain serviceability save regular cleaning. Attention to the following points will ensure a long and useful service life with minimum need for repair. Should servicing or repair involving disassembly be required, refer to Section 5 of this manual.

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 tracks on the top stage of the column.

NOTE: DO NOT use oil or grease on any exposed part of the column. This is unnecessary and traps dirt which acts as an abrasive.

3 Use out-of-doors will require special attention, especially in adverse conditions. Salt spray must be washed off with fresh water at the earliest opportunity. Do not allow water to enter the column. Sand and dirt acts as an abrasive and should be removed with a semi-stiff brush or a vacuum cleaner.

NOTE: 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.

Routine checks

4 Check the following during normal use:

4.1 Check for ageing and cracking of the rubber straps which secure the struts to the foot assemblies and renew if necessary.

4.2 Check the effectiveness of the clamps.

4.3 Check for radial or side play in the top stage.

4.4 Check that pressure is not lost from the top stage during use.

Adjustments

5 Adjustments that may become necessary after considerable use are as follows:

5.1 Taking up wear in the bottom clamp.

5.2 Taking up wear in the skid clamp.

5.3 Elimination of radial and side play on the top stage.

5.4 Tensioning the steering belt and eliminating backlash in the steering ring.

5.5 Skid wheel alignment

Bottom clamp adjustment

6 When applied finger-tight, the ‘V’ notch on the bottom clamp knob should be within the limits shown. Adjust the bottom clamp as follows (Fig 4.1):

6.1 Tighten the clamp finger-tight.

6.2 Remove the hole plug (1). Remove the screw (2) and washer (3) securing knob (4) to the spindle (5).

6.3 Remove the knob, turn counter-clockwise, then replace on spindle (5) so that the ‘V’ notch on the clamp knob is within the limits shown.

6.4 Degrease screw (2), coat with Loctite 222E and secure knob with washer (3) and screw (2). Replace hole plug (1).

Skid clamp adjustment

7 To adjust the skid clamp:

7.1 The skid clamp is applied or released by turning the handle clockwise or counter-clockwise. The handle has a pull-off/push-on ratchet adjustment. To take up wear, pull the handle away from the spindle, rotate counter-clockwise and release.

7.2 Repeat the above procedure, as necessary, until the clamp locks when applied but allows free movement when released.

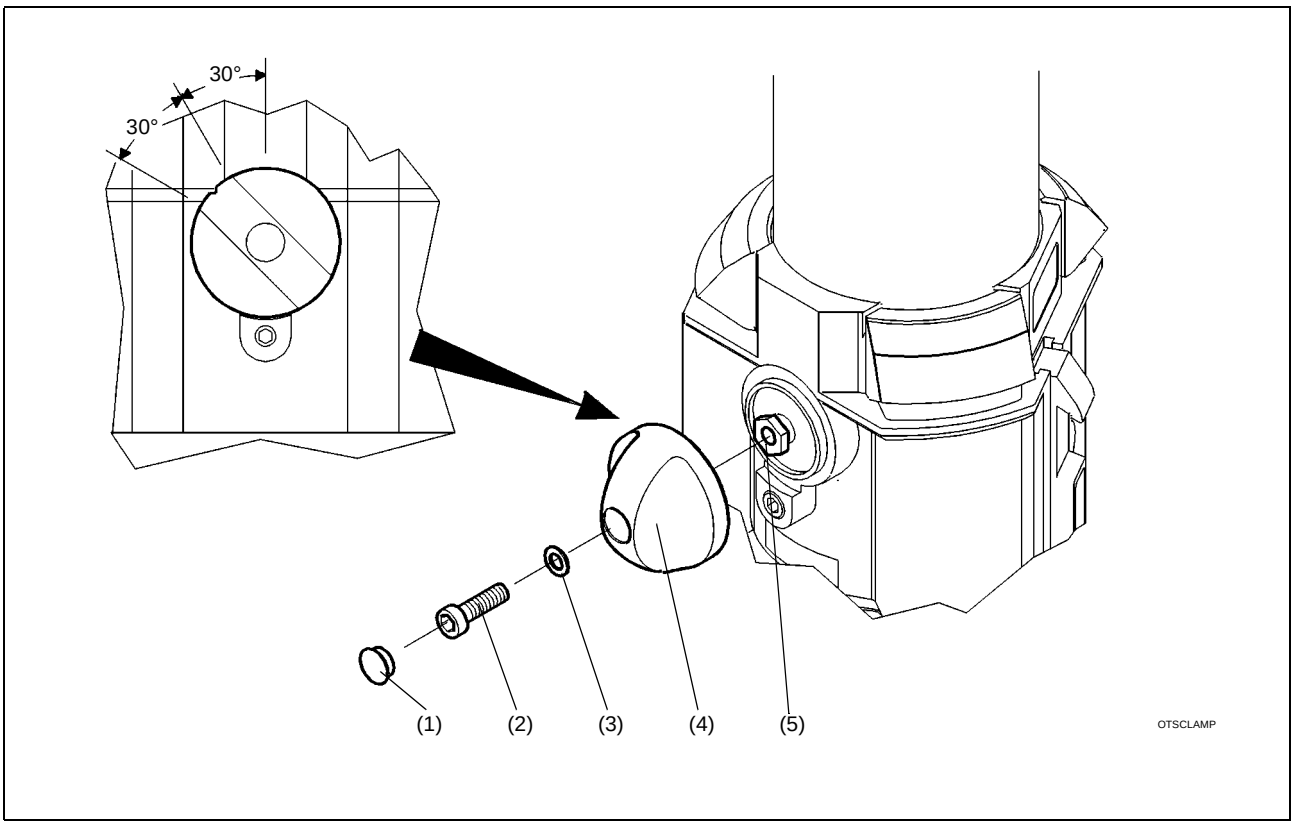


Fig 4.1 Bottom clamp adjustment

Elimination of radial and side play on the top stage

8 To eliminate radial and side play (Fig 4.2):

8.1 Balance the top stage without a payload.

8.2 Remove the cover (2) from the roller housing opposite the clamp by prising it off with a flat-bladed screwdriver.

8.3 Remove and degrease four grub screws (3) and coat their threads with Loctite 222E.

8.4 Refit two upper grub screws (3) and simultaneously torque tighten to 0.23 Nm (2 lbf in.)

8.5 Move the top stage over its complete range and ensure that both upper rollers (1) rotate throughout. If not, slacken both grub screws and retighten to 0.23 Nm (2 lbf in.)

8.6 Repeat paras 8.4 and 8.5 for two lower grub screws.

8.7 Refit cover (2).

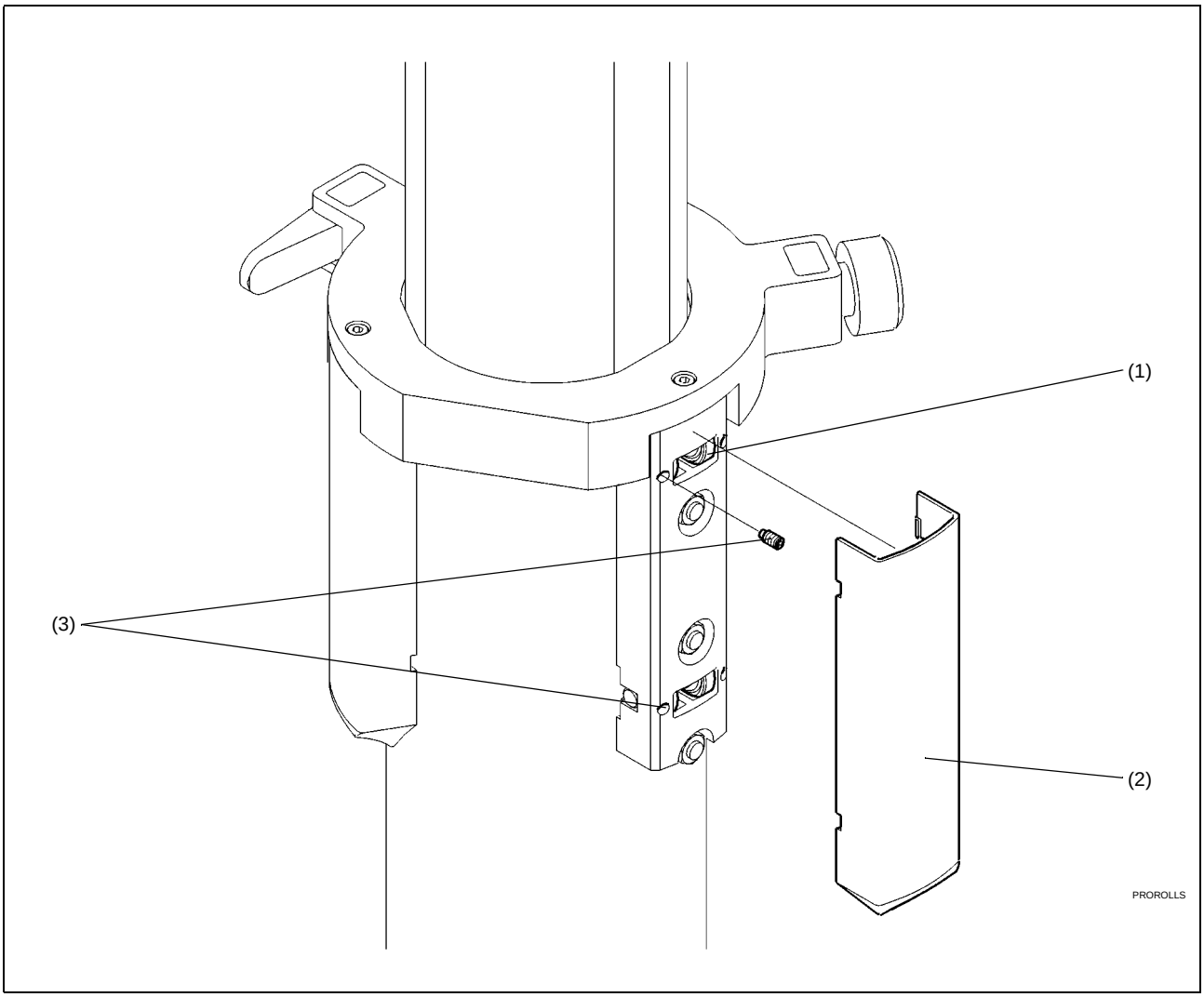


Fig 4.2 Elimination of radial and side play on the top stage

Steering adjustments

9 Inaccuracies in steering may be due to slackness in the steering belt or steering chains, or inaccurate tracking.

Tensioning the steering belt and eliminating backlash in the steering ring

10 To tension the steering timing belt and eliminate backlash in the steering ring, proceed as follows (Fig 4.3):

10.1 Remove and discard four hole plugs (1) and slacken four Nyloc nuts (3).

10.2 Raise the column to maximum height and apply the on-shot clamp.

10.3 At the two track rollers (2) adjacent to the pressure gauge, turn the shafts outwards, using the screwdriver slot on the lower end of the shaft, so that the bearings move away from the column to tension the steering timing belt (4). Maintain outwards pressure and tighten Nyloc nuts (3) to secure these rollers.

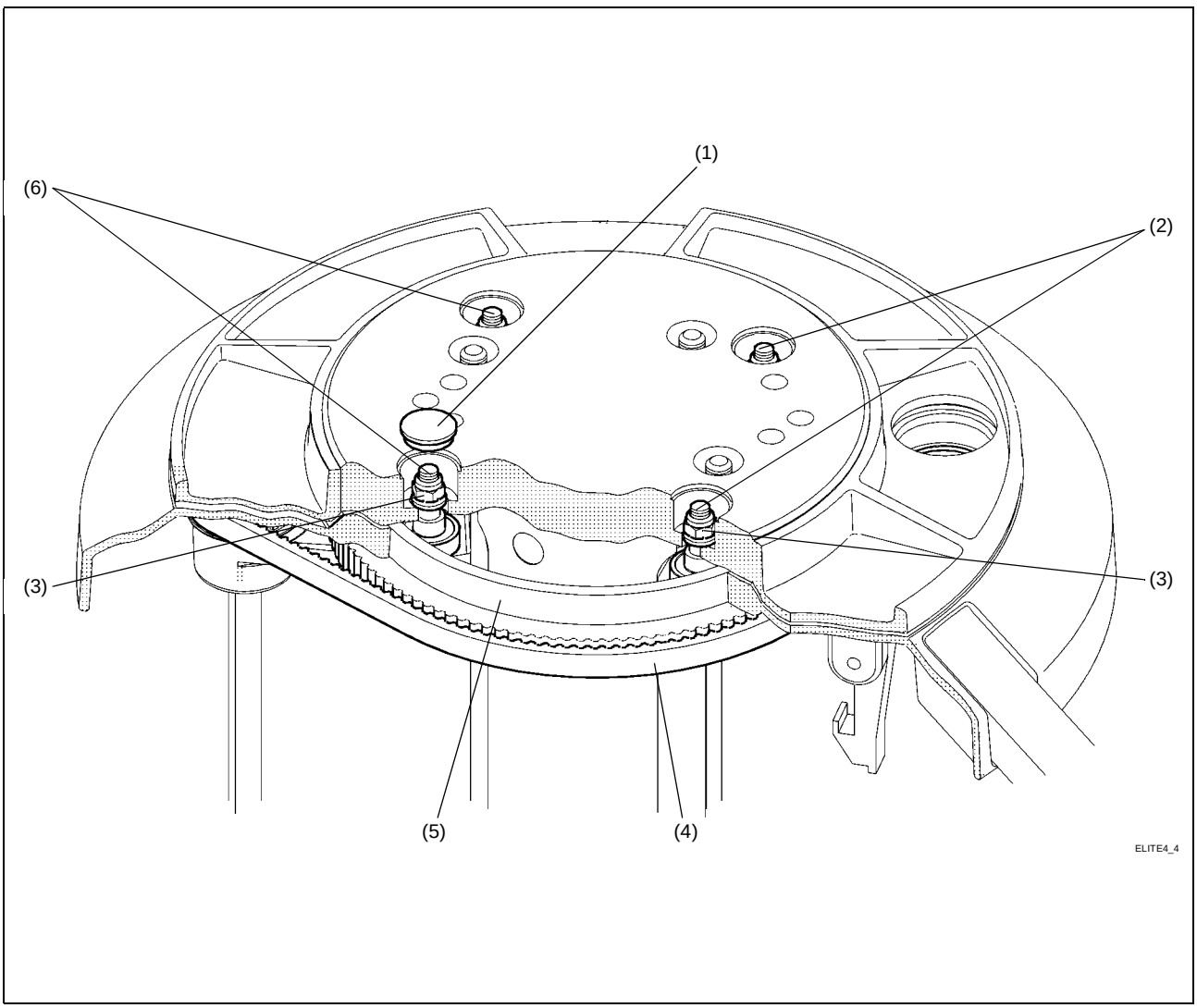


Fig 4.3 Tensioning the steering belt and eliminating backlash in the steering ring

10.4 At the two track rollers (6) adjacent to the steering column, turn the shafts outwards, using the screwdriver slot on the lower end of the shaft, to eliminate radial play in the steering ring (5). Maintain outwards pressure and tighten Nyloc nuts (3) to secure these rollers.

10.5 Turn steering ring through 360° and ensure steering ring does not bind at any point. Readjust if necessary.

10.6 Fit four new hole plugs (1) in the tank top plate.

Chain tension

11 The main steering chain (item 7, Fig 6.11) is tensioned by screwing in a grub screw. When the chain is correctly tensioned, there should be a deflection of approximately 3 mm. The chain may be accessed at the point (1) on Fig 4.4.

12 The chain in each leg (item 3, Fig 6.11) is tensioned by sliding the end housing outwards. There is no access to the leg chains.

13 Tension the chains as follows: (Fig 4.4):

13.1 Open the skid legs to the full track position.

13.2 At each end housing, remove screws (4) and (5) securing foot assembly (6).

13.3 On the underside of the foot assembly, slacken two screws (11).

13.4 Pull the end housing outwards as far as possible and, while holding the end housing, retighten one of the screws (11).

13.5 Tighten screw (12) to take up any slack in the adjuster. Release screw (11), then tighten adjusting screw (12) by one half turn.

13.6 Tighten both screws (11).

13.7 Refit the foot assembly (6) and secure lightly with screws (4) and (5).

13.8 Fit the column to the skid and, using the appropriate strut as a guide, position the foot assembly (6). Fully tighten screws (4) and (5).

13.9 Remove the blanking plug (3) covering the main steering chain adjusting grub screw (2).

13.10 Screw in the grub screw (2) to increase chain tension. The chain may be accessed at the point (1). Increase tension until deflection at point (1) is approximately 3 mm. Do not overtighten.

13.11 Refit the blanking plug (3).

Skid tracking adjustment

14 Skid tracking should be set so that over a distance of 3.6 m (12 feet), deviation does not exceed 50 mm (2 in.). Check the tracking as follows:

14.1 Draw a straight line on the studio floor at least 4 m (13 feet) long.

14.2 Ensure that the pedestal is carrying a payload of approximately 90 kg (120 lb).

14.3 Set the pedestal to crab and carefully align the wheels on the fixed leg and one of the other wheels with the line on the studio floor.

14.4 Push the pedestal 3.6 m (12 feet) along the line. The pedestal should not deviate more than 50 mm (2 in.) from the line.

14.5 Push the pedestal back to the starting point. The pedestal should not deviate more than 50 mm (2 in.) from the line.

14.6 Reposition the pedestal to align the wheels on the fixed leg and the other wheels with the line on the studio floor and repeat the above check.

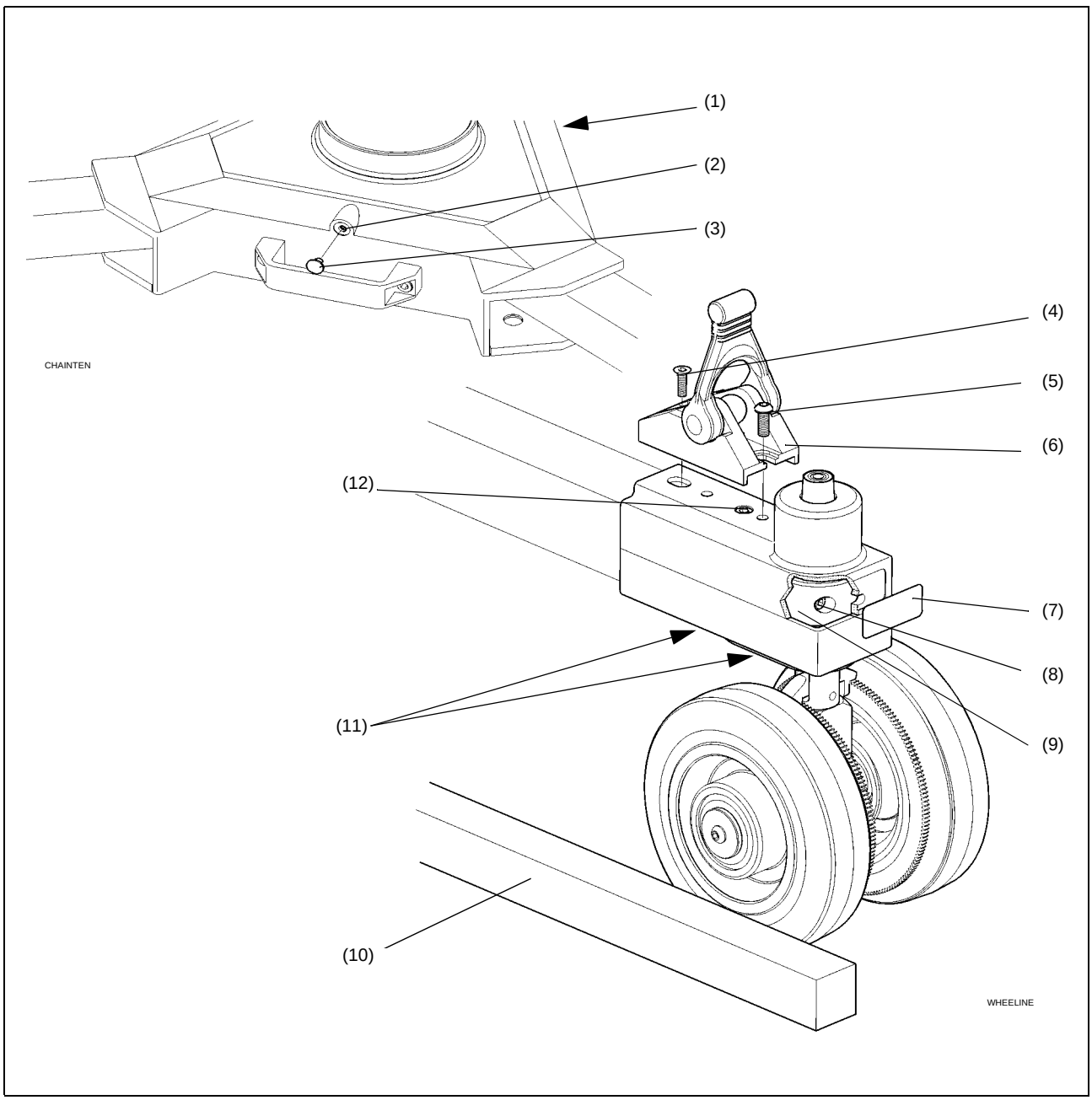


Fig 4.4 Skid tracking adjustment

15 If necessary, adjust the skid tracking (Fig 4.4) as follows:

NOTE: Access to the screws (8) will be affected by whether the skid was built in the open or closed position.

15.1 Set the crab/steer changeover mechanism to CRAB and set the folding legs to the fully open position.

15.2 Turn the fixed leg wheel until crab engages.

15.3 At each leg end housing carefully remove self-adhesive label (7) and ensure that the head of locking screw (8) is visible through the slot in the leg end housing. If not, turn the appropriate wheel through 180° against the action of the clutch.

15.4 If the screws (8) in the folding legs are still not visible, proceed as follows:

15.4.1 Fold each leg in turn until screw (8) becomes visible.

15.4.2 Slacken screw (8) until torque limiter sleeve (9) can just be rotated.

15.4.3 With the hexagonal wrench still in place in screw (8), move the leg to the fully open position.

15.4.4 Tighten screws (8).

15.5 Set the wheel on the fixed leg as follows:

15.5.1 Set the crab/steer changeover mechanism to STEER, rotate the wheels until the wheels on the folding legs engage in the steer position.

15.5.2 At this point the wheel on the fixed leg should be aligned for and aft. If necessary, slacken screw (8), align the wheel, then tighten screw (8) to 3.4 Nm (30 lbf in.).

15.5.3 Check by setting the crab/steer changeover mechanism to CRAB, turning the wheels and noting the alignment of the wheel on the fixed leg when all three wheels engage.

15.6 Set the wheel on each folding leg, in turn, as follows:

15.6.1 Set the crab/steer changeover mechanism to CRAB.

15.6.2 Slacken screw (8) on the folding leg.

15.6.3 Using a suitable 1 m straight-edge (10) as shown, align the wheels on the fixed and folding legs.

15.6.4 Tighten screw (8) on the folding leg to 3.4 Nm (30 lbf in.).

15.6.5 Repeat for the other folding leg.

15.7 Carry out a skid tracking check and re-adjust as necessary

15.8 Install labels (7) on each end housing.

Replacements

Replacing gas struts

16 Bottom stage elevation assistance is provided by a gas strut located in the telescopic column. To allow for various column loads, four versions of the strut are available, each designed to operate over a particular load range.

17 To replace the bottom stage gas strut, proceed as follows (Fig 4.5):

17.1 Apply the wheel brakes and set the top stage to its maximum height.

WARNING!: Set the bottom stage to its maximum height. If this is not done the gas strut will be under compression. Attempted removal of a compressed gas strut may lead to serious injury.

PAYLOAD	FORCE	PART No.
0-18 kg (0-40 lb)	270N	3328-307
18-32 kg (40-70 lb)	360N	3328-306
32-55 kg (70-120 lb)	450N	3328-305
55-75 kg (120-165 lb)	600N	3328-385

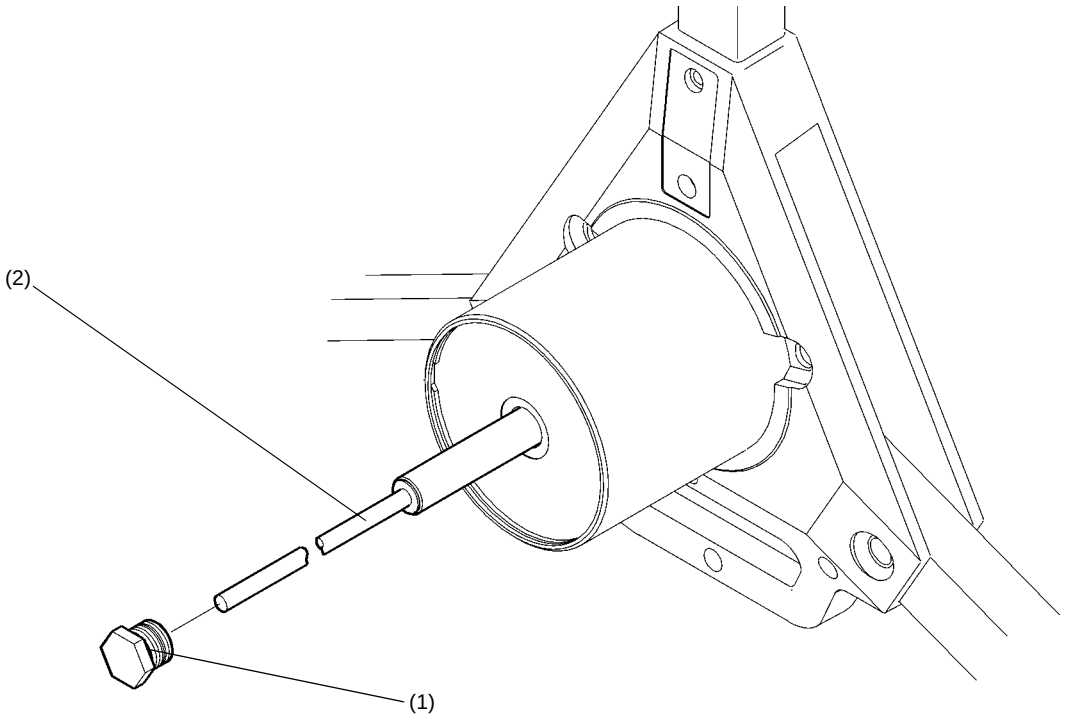


Fig 4.5 Replacing gas struts

17.2 Remove the load, release the bottom clamp and set the bottom stage to its maximum height.

17.3 Tip the pedestal over and carefully lay it on its side.

17.4 Unscrew and remove the centre end plug (1) from the base of the telescopic column.

17.5 Withdraw the gas strut (2) from the column.

17.6 Fit the new gas strut, cylinder end first, carefully guiding it up through the column until it is fully engaged. The strut is correctly fitted when the thread on the end plug (1) can be started in the column without compressing the strut.

17.7 Tighten the end plug (1).

17.8 Carefully stand the pedestal upright.

Optional wheels

18 A set of 160 mm (6.3 in.) wheels (Part No. 3329-30) is available to convert the skid from studio to OB use. A set of 125 mm (5 in.) wheels with cable guards (Part No. 3329-43) is available to convert an OB skid to a studio skid.

19 To replace the wheels (Fig 4.6):

19.1 Remove the column from the skid and turn the skid upside-down.

19.2 and remove the two countersunk screws (1) securing the wheel assembly (2) to the shaft (3).

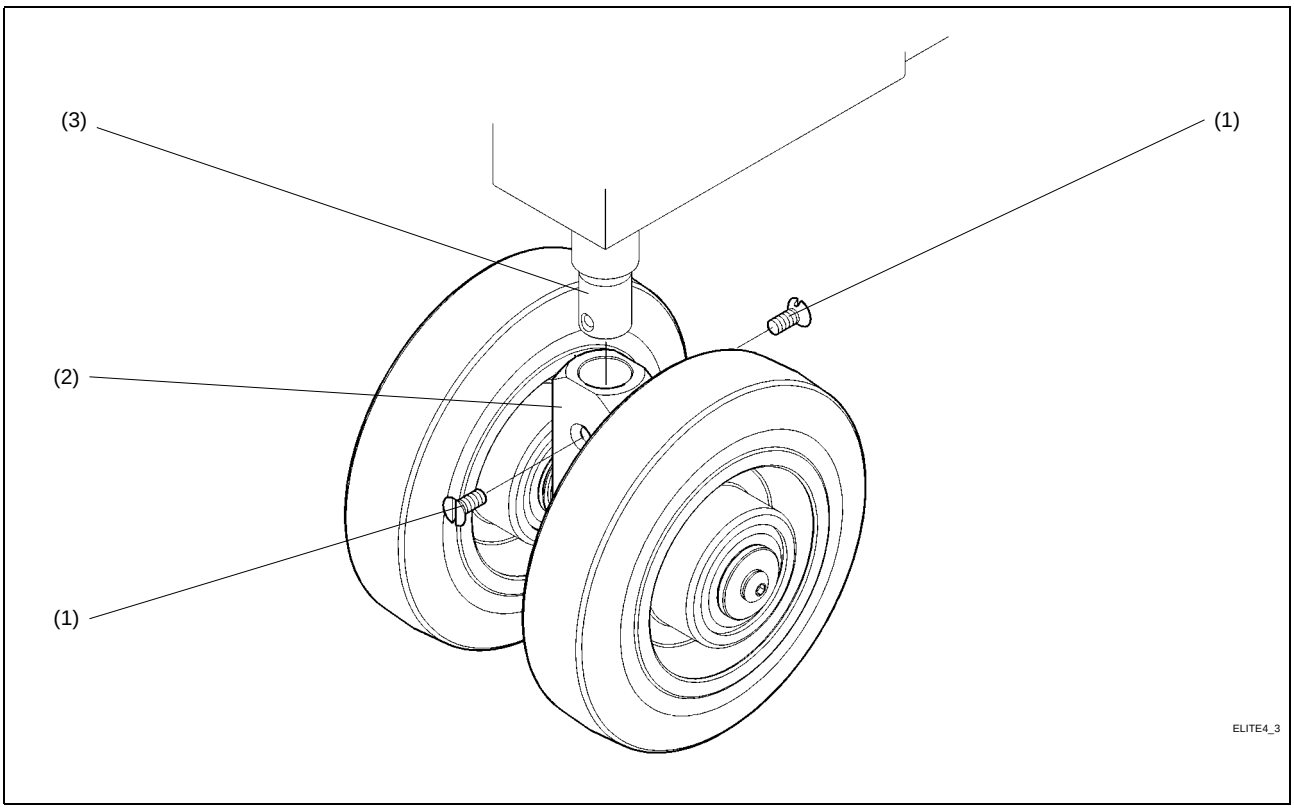


Fig 4.6 Optional wheels

19.3 Remove the wheel assembly, complete with cable guard.

19.4 Repeat for remaining two wheel assemblies. Store the wheels for future use.

19.5 Fit the replacement wheel assemblies (2) to the shafts (3) and secure each wheel assembly to the shaft with two countersunk screws (1).

Minor repairs

Leak testing and rectification on the tank assembly

WARNING!: This pedestal is pressurized to a maximum of 11.3 bar (165 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. The tank assembly, incorporating the top plate, tank tube, relief valve and tapered ram, is supplied as a pressure-tested assembly. The tank assembly should not be serviced or dismantled except as detailed in this manual

20 If it becomes apparent that air pressure is being lost from the top stage, pressurize the pedestal and check for leaks around the control valve, the inlet valve, the Schrader valve, the seal screw in the edge of the top plate above the pressure gauge, the pressure gauge and the safety catch bracket by applying a strong soap solution with a small paint brush. Leaks will be apparent by the appearance of bubbles. If there are no bubbles, the leak is within the tank assembly of the top stage. The tank assembly must be referred to Vinten Broadcast Limited or to your local distributor for rectification.

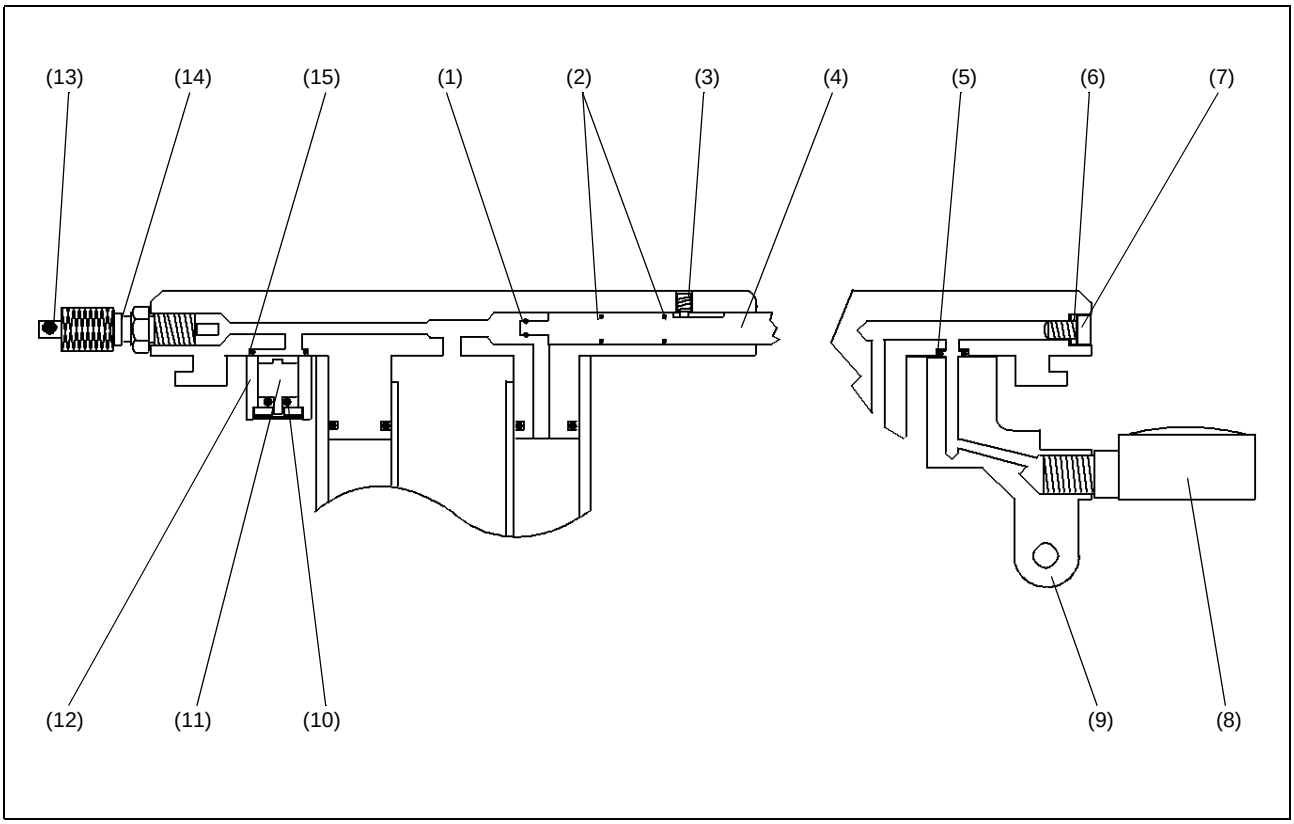


Fig 4.7 Leak testing and rectification on the tank assembly

21 In the event of an external leak, proceed as follows (Fig 4.7):

21.1 Control valve - renew the control valve `O' rings (1) and (2) as follows:

21.1.1 Remove grub screw (3) and pull out control valve shaft (4). Remove and discard one `O' ring (1) and two `O' rings (2) taking care to avoid damage to the grooves for the `O' rings.

21.1.2 Lightly apply white bearing grease to two `O' rings (2) (Part No. Q001-104) and one `O' ring (1) (Part No. Q001-011) and install on control valve shaft (4). Install the shaft in the tank top plate. Degrease grub screw (3), coat thread with Loctite Prism 406 and insert in tank top plate to engage in groove in control valve shaft.

21.2 Inlet valve - renew the inlet valve `O' ring (15) and the inlet valve `V' ring (10) as follows:

21.2.1 Remove two socket head cap screws securing inlet valve housing (12) to top plate of tank assembly. Remove and discard `O' ring (15) taking care to avoid damage to the sealing faces for the `O' ring. Remove inlet valve (11) complete with `V' ring (10). Remove and discard the `V' ring.

21.2.2 Fit `V' ring (10) (Part No. R300-004) on long spigot of inlet valve (11) with small diameter end towards body of valve and install valve in inlet valve housing (12). Lightly apply white bearing grease to `O' ring (15) (Part No. Q001-019) and install `O' ring and inlet valve housing on tank top plate. Degrease and coat the threads of two securing screws with Loctite Prism 406 and secure inlet valve housing.

21.3 Schrader valve - replace or reseal the Schrader valve (14) as follows:

21.3.1 Remove Schrader valve pressure release button (13) and Schrader valve (14) from top plate of tank assembly.

21.3.2 Degrease and prime thread of Schrader valve (14) with Loctite Primer T and allow to dry. Coat thread with Loctite 542 and install Schrader valve on tank top plate.

21.4 Pressure gauge - replace or reseal the pressure gauge and catch bracket seal as follows:

21.4.1 Raise the column and apply the top stage clamp.

21.4.2 Remove three screws (Fig 6.3 item 2) which secure catch bracket (9) to the top plate of the tank assembly.

21.4.3 Remove and discard `O' ring (5).

21.4.4 If the leak was at the pressure gauge (8) (Part No. J001-040), unscrew the pressure gauge from the catch bracket.

21.4.5 Degrease the thread of the pressure gauge, prime it with Loctite Primer T and allow to dry. Coat thread with Loctite 542 and install pressure gauge on catch bracket, ensuring face of gauge is horizontal and uppermost.

21.4.6 Fit a new `O' ring (5) (Part No. Q001-011) and secure the catch bracket to the tank top plate with three screws (Fig 6.3 item 2).

21.5 Seal screw - reseal the seal screw above the pressure gauge as follows:

21.5.1 Remove screw (7) and sealing ring (6) from recess in edge of tank top plate.

21.5.2 Degrease thread of screw (7), prime with Loctite Primer T and allow to dry.

21.5.3 Fit new sealing ring (6) (Part No. R300-003) onto screw (7), apply Loctite 542 to thread of screw and install in tank top plate. Tighten screw to a toque of 11.3Nm (8.3lbf ft).

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 the Illustrated Parts List (Section 6).

WARNING!: This pedestal is pressurized to a maximum of 11.3 bar (165 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

Separating the telescopic column and skid

NOTE: If the elevation tube is to be removed from the outer tube, this should be done before separating the telescopic column from the skid.

3 To separate the telescopic column and skid:

3.1 Apply the wheel brakes.

3.2 Set the safety catch slide to ON (I) and fully depress the moving column until the safety catch engages.

3.3 Remove the payload.

3.4 Remove any trim weights from the weight platform secure in the trim weight stowage.

3.5 Release the skid clamp.

3.6 Release the three rubber foot straps from the struts.

3.7 Raise the longer strut (on the fixed skid leg), which will remain raised when released. Raise and hold the two shorter struts, then lift the complete column vertically off the skid.

3.8 Remove the kick bar from the skid by releasing the sliding catches.

Gas strut

4 To remove the bottom stage gas strut, proceed as follows:

WARNING!: Set the bottom stage to its maximum height. If this is not done the gas strut will be under compression. Attempted removal of a compressed gas strut may lead to serious injury.

4.1 Release the bottom clamp and set the bottom stage to its maximum height.

4.2 Carefully lay the pedestal on its side.

4.3 Unscrew and remove the centre end plug (Fig 6.4, item 23) from the base of the telescopic column.

4.4 Withdraw the gas strut (Fig 6.2, item 20) from the column.

4.5 Lower the elevation tube.

Removing the top stage and elevation tube from the outer tube

WARNING!: Ensure all pressure is vented before disassembling any part of the telescopic column.

5 To remove the top stage and elevation tube from the outer tube:

5.1 With the pedestal standing on its wheels, fully raise the column

5.2 Using the Schrader valve cap, reduce pedestal pressure to zero.

5.3 Remove the steering ring by unscrewing each fastener until it releases. Lift the steering ring off the hub assembly.

5.4 Referring to Fig 6.2, remove and discard four hole plugs (49) and slacken four Nyloc nuts (50) to relieve tension on the steering timing belt (29). Slide the timing belt downwards off the steering gear (30).

5.5 Remove three screws (38) which secure the drive adaptor bracket (28) to the top plate of the tank assembly and lower the top part of the steering assembly onto the steering column support bracket.

5.6 If the lower part of the column is to be dismantled, refer to Fig 6.4 and remove four screws (52) securing steering column assembly (51) to the outer tube.

5.7 Remove the gas strut (Para 4).

5.8 Lower the column fully and apply the on-shot clamp.

5.9 Referring to Fig 6.4, remove grub screw (41), spring (42) and guide pin (43) from top housing (11).

5.10 Rotate the elevation tube 60° clockwise, viewed from above.

5.11 Lift the elevation tube and tank out of the outer tube.

5.12 Remove the clamp (2) and shim(s) (1) from the spindle of the bottom clamp (48).

Separating the top stage and elevation tube

6 To separate the top stage and elevation tube (Fig 6.2):

6.1 Ensure drag control is set to minimum. Stand the assembly up-side-down on the top plate.

6.2 Remove four screws (21) washers (22) and washers (23) securing tapered ram end ring (17) to the elevation tube (19).

6.3 Lift the elevation tube off the top stage.

Dismantling the outer tube

7 To dismantle the outer tube (Fig 6.4):

7.1 Remove 12 screws (35) securing three trim weight pockets (25-34) to top housing (11). Dismantle trim weight pockets if required.

7.2 Remove two grub screws (40) securing long strut (36) in top housing assembly.

7.3 Remove two screws (12), two pivot shaft sleeves (14) and two strut pivot shafts (13) securing short struts (16) to top housing assembly.

7.4 Mark the position of skid clamp (24) horizontally and radially on the outer tube. Slacken retaining screw (17) and slide the skid clamp off the outer tube.

7.5 Remove hole plug (44) from clamp knob (47). Remove screw (45) and shakeproof washer (46), pull off the knob (47) and remove clamp spindle (48).

7.6 Remove three top housing covers (49) by springing the sides apart and pulling them away from the top housing. The top housing cover springs (50) are attached to bosses in the covers and should be removed with care.

7.7 Remove self-adhesive catch label (8). Remove two screws (7) and washers (6) which secure spring sleeve (9), spring (10) and ball (4). Slide catch (5) up and out of top housing.

7.8 Remove outer snap ring (20) from the base of the outer tube by prising out the exposed bevel end with a screwdriver until enough of the ring is free of the annular groove to allow a second screwdriver to be inserted behind it. Progressively free the ring until it can be pulled from the outer tube.

7.9 Remove bottom end plug (22) and inner snap ring (20) from outer tube. Examine bump-stop ‘O’ ring (21) in bottom end plug and remove if worn or damaged.

Dismantling the elevation tube

8 To dismantle the elevation tube (Fig 6.3):

8.1 Remove self-adhesive lock label (26). Remove dowel pin (25) securing clamp lever (15) to top housing (14). Remove end cap (16), screw (17), washer (18), spring plunger (19) and spring (20). Remove on-shot clamp assembly (1) from inside the top housing.

8.2 Remove self-adhesive drag label (32). Remove screw (33) securing drag assembly in top housing (14). Unscrew and remove clamp screw (31). Remove spring (30) and drag pad (29) from top housing. Examine friction pad (28) adhered to drag pad.

8.3 Using a flat-bladed screwdriver, prise of three roller housing covers (21).

8.4 Note the type and position of each roller housing (3, 23) and remove three nuts (6) and washers (7) and one screw (27) securing each roller housing. Remove each roller housing in turn and note the type of roller shaft (2, 24) fitted in each. Examine ‘O’ rings (22) and bearings (5) and replace as necessary.

8.5 Examine wipers (8) and replace as necessary.

Dismantling the top stage

9 To dismantle the top stage (Fig 6.2):

WARNING!: The top plate, tank tube, relief valve assembly and tapered ram assembly form the pressure vessel of the pneumatic system. These parts are supplied as a pressure tested assembly and should not be dismantled.

9.1 Remove the elevation tube from the top stage (Para 6).

9.2 Remove six screws (43) which secure left and right weight trays (3, 42) to the top plate of tank assembly (1).

9.3 Remove three screws (2) which secure catch bracket (12) to top plate of tank. Remove and discard `O' ring (10).

NOTE: The design of the steering gear (30) and its support bearings was improved at pedestal Serial No. 1324**. Earlier pedestals may be updated by replacing the steering gear and support bearings. A kit (3374-909SP) is available.**

9.4 Remove four Nyloc nuts (52) and washers (53) securing ‘V’ bearing and shaft assembly (41) to top plate of tank assembly (1). Remove steering gear (30) and steering ring hub assembly (32). Remove six screws (33) to separate steering gear and steering ring hub. The Perspex disc (4) is retained in the steering ring hub with Silcoset 153.

9.5 Remove four circlips (40) securing washers (39), washers (37) and head fixing shafts (34) to top plate of tank assembly (1). Discard circlips (40).

9.6 To replace the tracks (27), remove screw (26), track clamp plate (36) and screw (35).

9.7 If required, remove circlip (18) securing end ring (17) to tapered ram (25). Install a temporary fixing in circlip slot to prevent ram falling inside tank.

Dismantling the steering column assembly

10 Unless it is essential it is advisable not to dismantle the steering column. Limited dismantling is possible, as follows (Fig 6.5):

10.1 Note orientation of steering pulley (13) on steering tubes assembly (5). Drive out dowel pin (12) and pull off steering pulley.

10.2 Pull drive adaptor bracket (1) off steering tubes assembly and immediately install a temporary pin in steering tubes assembly to prevent collapse of tubes. Remove bearings (2) from bracket if required.

10.3 Remove steering tube bearing sleeves (8) by prising out locators and sliding sleeves off steering tubes assembly.

10.4 Slide spring (9) and spring thrust disc (7) off steering tubes assembly.

10.5 Remove steering tubes assembly and attached parts from support bracket (6). Take care that interlocking tubes do not separate. Remove ‘O’ ring (4), which is glued to support tube, if required.

10.6 Slacken two grubscrews (11) and pull steering tube upper bearing sleeve (3) off steering tubes assembly (5).

Skid

Braked end housing units

11 To remove the braked end housing units (Fig 6.7):

11.1 Remove two screws (25) securing braked wheel unit to wheel unit shaft (26). Remove wheel unit and remove and discard `O' ring (24).

11.2 Referring to Fig 6.6, remove screws (11, 12) securing foot support assembly (9) to end housing.

11.3 Referring to Fig 6.7, with the skid supported upside-down, remove chain adjuster wedge screw (1) and two screws (27).

11.4 Remove upper housing (2) complete with brake assembly. Take care to retain special nut (40) and steel ball (30) from brake assembly.

11.5 Remove circlip (28) and shaft bearing disc (29) from upper housing. Remove brake rod detent disc (31), brake button (32) and brake detent sleeve (34). Remove two `O' rings (33) and `O' ring (3). Discard circlip (38), two `O' rings (33) and `O' ring (35).

11.6 Turn the skid right-way-up. Remove and discard circlip (4) and remove and retain shim washer(s) (5). Restrain torque limiter sleeve (7) to prevent it springing off shaft and slacken locking screw (6). Remove torque limiter sleeve, taking care to retain two steel balls (9) and two springs (8).

11.7 Remove lower housing (13) complete with wheel unit shaft (26), sliding shaft out of sprocket (11).

11.8 Free sprocket (11) from chain and remove sprocket complete with bearings (10, 12). Push bearings out of sprocket if required.

11.9 From inside leg tube remove spacing sleeve (36), chain adjuster wedge (37) and chain adjuster rod (39).

11.10 Remove wheel unit shaft (26) from lower housing complete with brake mechanism. Remove bearing (14) from lower housing.

Braked wheel unit shaft

12 To dismantle the braked wheel unit shaft (Fig 6.7):

12.1 Remove the wheels and braked end housings (Para 11).

12.2 Remove spring pin (23) securing brake bar return sleeve (21) to brake push rod (20).

12.3 Pull brake push rod (20), spring (17) and spacer (18) out of wheel unit shaft. Remove `E' clip (15) and thrust washer (16) from push rod.

12.4 Slide brake bar (19) out of wheel unit shaft and remove brake bar return sleeve (21) and spring (22).

Tiller end housing unit

13 To remove the tiller end housing unit (Fig 6.8):

13.1 Remove two screws (19) securing wheel unit to wheel unit shaft (17). Remove wheel unit and remove and discard `O' ring (18).

13.2 Referring to Fig 6.6, remove screws (11, 12) securing foot support assembly (9) to end housing.

13.3 Referring to Fig 6.7, unscrew and remove tiller blanking cap (1).

13.4 Support the skid upside-down. Remove cable clamp securing screws (20) and cable clamp mounting (21). Remove chain adjuster wedge screw (28) and two screws (22).

13.5 Remove upper housing (2), taking care to retain special nut (27).

13.6 Remove circlip (5) and shaft bearing disc (4) from upper housing. Discard circlip (5).

13.7 Turn the skid right-way-up. Remove and discard circlip (6) and remove and retain shim washer(s) (7). Restrain torque limiter sleeve (9) to prevent it springing off shaft and slacken locking screw (8). Remove torque limiter sleeve, taking care to retain two steel balls (11) and two springs (10).

13.8 Remove lower housing (15) complete with wheel unit shaft, sliding shaft out of sprocket (13).

13.9 Free sprocket (13) from chain and remove sprocket complete with bearings (12) and (14). Push bearings out of sprocket if required.

13.10 From inside leg tube remove spacing sleeve (24), chain adjuster wedge (23) and chain adjuster rod (26).

13.11 Remove wheel unit shaft (17) from lower housing. Remove bearing (16) from lower housing.

Base plate

14 To remove the base plate:

14.1 Referring to Fig 6.9, remove three screws (19) securing steering gear cover (18) to base plate (9).

14.2 Remove screw (17), washer (16) and cap (15) securing steering gear (14). Pull steering gear off sprocket sleeve (8), taking care to retain key (20).

14.3 Note orientation of pinion (13) on steering shaft (1) and remove pin (12) securing pinion to steering shaft.

14.4 Referring to Fig 6.10, remove two screws (1) securing folding leg spindles to base plate. Remove screw (23) and screw (24) securing fixed leg, noting relative positions of different screw lengths. Remove four screws (25) securing base plate.

14.5 Remove leg indexing plunger (6), spring (7) and shim (8) from each folding leg.

14.6 Referring to Fig 6.9, remove three screws (21) and washers (22) securing bearing clamp ring (11) to base plate. Remove bearing (10).

14.7 The steering drive shaft (1) and sprocket sleeve (8) may be removed at this stage. The flanged bearing (2) may be removed from the base plate (9) if required, but is retained with Loctite 601.

Folding legs

15 To remove the folding legs (Fig 6.10):

15.1 Remove the braked end housings (Para 11) and base plate (Para 14).

15.2 Remove tube end plug (11) from leg (9).

15.3 Remove the joining link and remove steering chain from leg pivot sprocket sleeve (17).

15.4 Lift the legs off the sprocket sleeves. Retain shim washers (13).

15.5 Remove plunger housing (18) and two screws (10) securing leg pivot spacer (12), if required.

Fixed leg

16 To remove the fixed leg (Fig 6.10):

16.1 Remove the tiller end housing (Para 13) and base plate (Para 14).

16.2 Remove joining link and remove steering chain from crab/steer changeover mechanism (Para 18).

16.3 Remove fixed leg.

Main steering chain and leg pivot sprocket sleeves

17 To remove the main steering chain and leg pivot sprocket sleeves (Fig 6.11):

17.1 Remove and discard hole plug (15). Fully undo grub screw (14) to release main steering chain tension.

NOTE: The flanged sleeve leg pivots (11 and 17) are handed. Identify before removal.

17.2 Remove eight screws (18) securing left and right flanged sleeve leg pivots (11, 17). Remove two slipper pivot pins (12) and chain tensioner slipper (13).

17.3 Remove the joining link (16) and remove main steering chain (7).

17.4 Referring to Fig 6.10, slide leg pivot sprocket sleeves (17), complete with bearings (15) off leg pivot spindles (19). Retain shim washers (13). Remove bearings from sprocket sleeves if required.

17.5 Referring to Fig 6.6, carefully remove the self-adhesive `VINTEN' nameplate (3) from the top of the centre housing.

17.6 Referring to Fig 6.10, remove two screws (20) securing leg pivot spindles to centre housing. Remove leg pivot spindles (19).

Crab/Steer changeover mechanism

18 To dismantle the crab/steer changeover mechanism (Fig 6.9):

18.1 If not already removed, remove steering drive shaft (1) from centre housing and sprocket sleeve (8) from steering mechanism sprocket shaft (5).

18.2 The plain bearings (6, 7) may be removed from the sprocket sleeve (8) if required, but are retained with Loctite 601.

18.3 Remove four screws (37) securing bearing ring (38) to centre housing. Pull changeover mechanism out of housing, taking care to retain steel ball (28) from changeover button.

18.4 Remove and discard circlip (29) securing bearing (30) and bearing ring (39) to sprocket shaft (5).

18.5 Remove spring pin (35) securing return sleeve (36) to steering mechanism push rod (34). Pull push rod and spring (33) out of sprocket shaft. Remove `E' clip (31) and thrust washer (32) from push rod.

18.6 Disengage changeover link (23) from changeover pins (24) and remove pins and link from sprocket shaft. Remove return sleeve (36) and spring (4) from sprocket shaft.

18.7 Remove changeover detent disc (27), changeover button (26) and changeover detent sleeve (25) from centre housing. Remove and discard two `O' rings (40) and `O' ring (41).

18.8 Remove buffer pads (38) from recesses in bearing ring (39). Early skids also had buffer pads in sprocket sleeve (8). These should be discarded.

18.9 The flanged bearing (2) may be removed from the centre housing (3) if required, but is retained with Loctite 601.

Assembly

Column

WARNING!: All seals and screws that are disturbed must be replaced with genuine vinten seals and screws.

Assembling the outer tube

19 To assemble the outer tube (Fig 6.4):

19.1 If the bump-stop ‘O’ ring (21) was removed from the bottom end plug (22), degrease the end plug and install a new ‘O’ ring using Loctite 415.

19.2 Install inner snap ring (20), bottom end plug (22) and outer snap ring (20) in the base of the outer tube.

19.3 Slide catch (5) into top housing (11). Lubricate ball (4) and spring (10) with white bearing grease. Install ball, spring and spring sleeve catch (9) and secure with two washers (6) and screws (7). Install self-adhesive catch label (8).

19.4 Install a spring (50) on the bosses in three top housing covers (49) and clip the covers into position on the top housing, engaging spring on lip in cover and against side of housing.

19.5 Lubricate clamp spindle (48) with white bearing grease and install in top housing. Do not install clamp knob (47) at this stage.

19.6 Slide the skid clamp (24) onto the outer tube, to the position marked in Para 7 and tighten retaining screw (17).

19.7 Install two short struts (16) in the top housing and secure with two screws (12), two pivot shaft sleeves (14) and two strut pivot shafts (13).

19.8 Lubricate the pivot points on the long strut (36) with white bearing grease and install in the top housing. Degrease the threads of two grub screws (41) and coat with Loctite 222E. Tighten the grub screws until the strut will hold its own weight when set at a right angle to the tube.

19.9 Assemble trim weight pockets (if dismantled) and secure to the top housing with 12 screws (35). Paint screw heads Nimbus grey.

Assembling the elevation tube

20 To assemble the elevation tube (Fig 6.3)

20.1 Examine friction pad (28). If necessary replace, adhering friction pad to drag pad (29) using Loctite Primer T and Loctite 380.

20.2 Lightly lubricate friction pad (28) with Molykote 111.

20.3 Install drag pad (29) and spring (30) in top housing

20.4 Lightly lubricate clamp screw (31) with white bearing grease and screw into top housing until screw (33) can be installed to engage with groove in clamp screw. Install self-adhesive drag label (32).

20.5 Install on-shot clamp assembly (1) from inside the top housing. Lightly lubricate spring (20) and spring plunger (19) with white bearing grease and install on on-shot clamp assembly from outside the top housing. Secure with washer (18) and screw (17), using Loctite 222E.

20.6 Install clamp lever (15) and secure with dowel pin (25). Ensure clamp lever is correctly installed - clamp is off when lever is to right. Install self-adhesive lock label (26).

20.7 Install new bearings (5) on roller shafts (2, 24), if necessary, as noted in Para 7. Adhere new ‘0’ rings (22) on roller shafts (24) using Loctite 389. Assemble roller housings (3, 23), backing off four grub screws (4) in adjustable roller housing (3) until the points do not project into the slots for the roller shafts. Install roller housings on elevation tube as noted in Para 7. Locate each roller housing on dowel pins (10) and secure with three washers (7) and nuts (6) and one screw (27). Tighten nuts (6) to a torque of 3.34 Nm (30 lbf in.).

NOTE: Do not install the roller housing covers (21) at this stage.

20.8 If removed, install three wipers (8) in the clamp housing using double-sided tape.

Assembling the top stage

WARNING!: The tank assembly, incorporating the top plate, tank tube, relief valve and tapered ram, is supplied as a pressure-tested assembly. The tank assembly should not be serviced or dismantled except as detailed in this manual.

21 To assemble the top stage (Fig 6.2):

21.1 If removed, install tracks (27) and secure with clamp plates (36) and screws (35) at the top end, using Loctite 222E.

21.2 Install three screws (26) and Loctite 222E at the bottom ends of tracks (27).

21.3 If removed, install Perspex disc (4) in steering ring hub (32) and secure with Silcoset 153.

NOTE: The design of the steering gear (30) and its support bearings was improved at pedestal Serial No. 1324**. Earlier pedestals may be updated by replacing the steering gear and support bearings. A kit (3374-909SP) is available.**

21.4 Position steering gear (30) on underside of steering ring hub (32) and secure with six screws (33).

21.5 Position steering gear and steering ring hub assembly on underside of top plate. Ensure ‘V’ bearing and shaft assemblies are correctly assembled and install in top plate to retain steering gear and steering ring hub assembly. Secure shaft assemblies with four washers (51) and Nyloc nuts (50). Do not tighten nuts (50) fully.

21.6 Lay the timing belt (29) into position round the steering gear (30).

21.7 Install `O' ring (10) and safety catch bracket (12) on tank top plate and secure with three screws (2). If the pressure gauge (11) was removed, degrease and prime thread of pressure gauge with Loctite Primer T and allow to dry. Coat thread with Loctite 542 and install pressure gauge on catch bracket, ensuring face of gauge is horizontal and uppermost.

21.8 Install left and right weight trays (3, 42) on top plate, ensuring hole in left weight tray aligns with pressure gauge and secure with six screws (43).

21.9 Remove temporary fitting installed in Para 9 and position tapered ram end ring (17) on tapered ram (25). Secure with shim(s) (24) and circlip (18). Adjust number of shims to remove end float from tapered ram.

Installing the top stage in the elevation tube

22 To install the top stage in the elevation tube (Fig 6.3):

22.1 Assemble the top stage (Para 21).

22.2 Assemble the elevation tube (Para 20).

22.3 Stand the top stage assembly vertically on the top plate. Ensure that the timing belt (Fig 6.2 item 29) has been laid in position round the steering gear ring (Fig 6.2 item 30).

22.4 Ensure the drag clamp screw (31) and on-shot clamp (15) are released.

22.5 Position the elevation tube so that the mounting holes in the top plate for the steering column are midway between the drag clamp and on-shot clamp. Lower the elevation tube on to the tank assembly.

22.6 Referring to Fig 6.2, secure tapered ram end ring (17) to elevation tube (19) with four washers (23), washers (22) and screws (21), using Loctite 222E. Do not fully tighten screws (21).

22.7 At the adjustable roller housing (3), remove and degrease four grub screws (4) and coat their threads with Loctite 222E.

22.8 Refit two grub screws on the upper roller and tighten fully and evenly.

22.9 Refit two grub screws on the lower roller and tighten fully and evenly. Ensure that top stage is central in the elevation tube. Adjust grub screws until this is achieved.

22.10 Move the elevation tube over its complete range and ensure that all rollers rotate throughout. Slacken or tighten grub screws until this is achieved.

22.11 Fully tighten screws (Fig 6.2, item 21) securing tapered ram end ring to elevation tube.

Installing the top stage and elevation tube in the outer tube

23 To install the top stage and elevation tube in the outer tube (Fig 6.4):

23.1 Assemble the outer tube (Para 19)

23.2 Install the top stage in the elevation tube (Para 22).

23.3 Install shim(s) (1) in the bore of clamp (2) and install clamp on bottom clamp spindle (48).

23.4 Position the elevation tube/top stage so that the adjustable roller housing is in line with the safety catch on the top housing.

23.5 Lower the elevation tube/top stage into the outer tube, then rotate 60° counter-clockwise until the groove in the tube aligns with the guide pin hole in the top housing.

23.6 Degrease the thread of grub screw (41) and coat with Loctite 222E. Install guide pin (43), spring (42) and grubscrew (41) in the top housing.

Assembling the steering column assembly

24 To assemble the steering column assembly (Fig 6.5):

24.1 If removed, degrease ‘O’ ring (4) and contact surfaces of support tube (6) and bond ‘O’ ring to support tube using Loctite 409.

24.2 Install steering tube upper bearing sleeve (3) on steering tubes assembly, ensuring locators engage with hole in outer steering tube. Using Loctite 242E, tighten grubscrews (11) to clamp sleeve legs firmly against outer tube without distortion. Lubricate sleeve with white bearing grease.

24.3 Install steering tubes assembly and attached parts in support bracket (6).

24.4 Lubricate bearing sleeves (8) and spring thrust disc (7) with white bearing grease. Slide disc, spring (9) and bearing sleeves onto steering tubes assembly (5), ensuring locators on bearing sleeves engage in holes in outer steering tube.

24.5 If removed, install bearings (2) in drive adaptor bracket (1).

24.6 Install assembled drive adaptor bracket (1) on steering tubes assembly and fit steering pulley in orientation noted during disassembly. Secure pulley with dowel pin (12) and Loctite 242E, ensuring pin is underflush with pulley.

Installing the steering column assembly

25 To install the steering column assembly:

25.1 Fully extend the column.

25.2 Referring to Fig 6.4, install steering column assembly (51) and secure with four screws (51). Do not tighten screws at this stage.

25.3 Referring to Fig 6.2, extend the steering column (28) and engage the timing belt (29) with the steering pulley. Ensure timing belt is correctly seated on steering pulley and steering gear (30).

25.4 Align the drive bracket with its fixing holes in the tank assembly top plate and secure with three screws (2). Do not tighten screws at this stage.

25.5 Fully depress the column and tighten screws in top plate and top housing.

25.6 Adjust timing belt tension and steering ring backlash (Section 4) and install four hole plugs (51) in tank top plate.

Gas strut

26 To install the gas strut:

26.1 Release the bottom clamp and set the elevation tube to its maximum height. Tighten the bottom clamp.

26.2 Lay the column on its side to gain access to the lower end of the outer tube.

26.3 Insert the gas strut, cylinder end first, into the base of the column until it is fully engaged. The strut is correctly fitted when the thread of the end plug (Fig 6.4, item 23) can be started in the end plate without compressing the gas strut.

26.4 Fully tighten the end plug.

Final assembly

27 Referring to Fig 6.2, install a washer (37) on each fixing shaft (34) and secure in the top plate with a washer (9) and circlip (40).

28 Referring to Fig 6.3, install three roller housing covers (21) on the elevation tube.

Skid

Crab/Steer changeover mechanism

29 To assemble the crab/steer changeover mechanism (Fig 6.9):

29.1 If buffer pads (38) were removed, degrease recesses for buffer pads in bearing ring (39) and prime with Loctite Primer 757. Allow primer to dry then install two buffer pads using Loctite Prism 406.

29.2 If the plain bearings (6, 7) were removed from the sprocket sleeve (8), degrease the bearings and sprocket sleeve and secure bearings with Loctite 601.

29.3 If the flanged bearing (2) was removed from the centre housing (3), degrease the bearing and centre housing and secure bearing with Loctite 601.

29.4 Install spring (4) and return sleeve (23) in sprocket shaft (5). Lubricate two changeover pins (24) with GP50 grease and insert pins and changeover link (23) in sprocket shaft.

29.5 Install `E' clip (31), thrust washer (32) and spring (33) on steering mechanism push rod (34). Install push rod in sprocket shaft and secure return sleeve (36) to push rod with spring pin (35).

29.6 Lubricate changeover detent disc (27), changeover button (26), changeover detent sleeve (25), `O' ring (41) and two `O' rings (40) with white bearing grease and install in centre housing (3).

29.7 Degrease bearing ring (39) and four screws (37). Install bearing (30) and sprocket shaft (5) in bearing ring and secure with new circlip (29).

29.8 Install steel ball (28) in changeover button (27). Install sprocket and bearing ring assembly in centre housing (3) and secure with four screws (37), using Loctite 221 under screw heads.

Leg pivot sprocket sleeves

30 To install the leg pivot sprocket sleeves (Fig 6.10):

30.1 Set crab/steer changeover mechanism to STEER (selector button up).

30.2 If removed, install leg pivot spindle (19) and two bearings (15) in leg pivot sprocket sleeve (17).

30.3 Degrease two screws (20) and contact area on centre housing. Install leg pivot sprocket sleeves on centre housing, using two shim washers (13). Secure with two screws (20), using Loctite 221 under screw heads.

Main steering chain

31 To install the main steering chain (Fig 6.11):

31.1 Install main steering chain (7) by passing it round the lower sprocket on the leg pivot sprocket sleeves and the steering mechanism sprocket shaft. Secure with joining link (16).

31.2 Install chain tensioner slipper (13) and two slipper pivot pins (12).

NOTE: The flanged sleeve leg pivots (10, 17) are handed. Ensure they are installed correctly.

31.3 Degrease left and right flanged sleeve leg pivots (10, 17) and eight screws (18). Install leg pivots and secure with eight screws, using Loctite 221 under screw heads.

31.4 Install grub screw (14) and tighten until slipper is in contact with chain. Do not fit hole plug (15) at this stage.

31.5 Install the self-adhesive `VINTEN' nameplate on the top of the centre housing.

Fixed leg

32 To install the fixed leg (Fig 6.10):

32.1 Install fixed leg (22) on bosses on centre housing (21).

32.2 Thread steering chain through leg and engage with upper sprocket on steering mechanism sprocket shaft.(Fig 6.11, item 1) so that ends of chain at outer end of leg are of equal length. Tie or tape ends of chain to leg end.

Folding legs

33 To install the folding legs (Fig 6.10):

33.1 Degrease plunger housings (18) and contact areas in folding legs (9). Secure housings in legs with Loctite 601.

33.2 Degrease two leg pivot spacers (12) and four screws (10) and secure pivot spacers to legs using Loctite 221.

33.3 Install two shim washers (13) on each leg pivot spindle (19). Install the folding legs over flanged sleeve leg pivots (17).

33.4 Install shim (8) on each folding leg.

33.5 Set legs to the fully open position

33.6 Thread steering chains through legs and engage with upper sprockets on sprocket sleeves (17) so that ends of chains at outer end of each leg are of equal length. Tie or tape ends of chains to leg ends.

33.7 Install tube end plugs (11) in legs.

Base plate

34 To install the base plate (Fig 6.10)

34.1 Lubricate spring (7) and plunger (6) with white bearing grease and install in each folding leg.

34.2 Degrease contact areas on base plate, two screws (1), screw (23) and screw (24).

34.3 Install base plate and secure with four screws (25). Install screw (23) and screw (24) to secure fixed leg and two screws (1) to secure folding leg pivots, using Loctite 221 under screw heads.

34.4 Referring to Fig 6.9, install bearing (10) on steering mechanism sprocket sleeve 8) and secure with bearing ring (11), three washers (22) and three screws (20).

34.5 If the flanged bearing (2) was removed from the base plate, degrease the bearing and base plate and secure bearing with Loctite 601.

34.6 Degrease steering shaft (1), pinion (13) and pin (12). Install steering shaft in crab/steer changeover mechanism housing. Install pinion on steering shaft in correct orientation and secure with pin, using Loctite 601.

34.7 Install key (20) and steering gear (14) on sprocket sleeve and secure with cap (15), washer (16) and screw (17).

34.8 Install steering gear cover (18) on base plate and secure with three screws (19), using Loctite 221.

Braked wheel unit shaft

35 To assemble the braked wheel unit shaft (Fig 6.7):

35.1 Install spring (22), brake bar return sleeve (21) and brake bar (19) in wheel unit shaft (26).

35.2 Install spacer (18), spring (17), thrust washer (16) and `E' clip (15) on brake push rod (20).

35.3 Install push rod assembly in wheel unit shaft and secure with spring pin (23) through brake bar return sleeve (21).

End housing units

NOTE: To facilitate tracking adjustment, both braked end housings (folding legs) and the tiller end housing (fixed leg) are installed at the same time.

36 To install the end housing units:

36.1 Ensure folding legs are fully opened.

36.2 Set crab/steer changeover mechanism to STEER (selector button up).

36.3 Referring to Fig 6.11, connect the ends of the folding leg steering chains (3) together using joining links (5), ensuring chains do not disengage from sprocket sleeves (10).

36.4 Referring to Fig 6.7, install chain adjuster rod (39), chain adjuster wedge (37) and spacing sleeve (36) in each folding leg, holding wedge temporarily with a suitable screw and large washer.

36.5 If bearings (10) and (12) were removed, push them into sprockets (11). Hook sprockets into chains so that when chains are pulled taut, countersunk holes in sprockets are in line with centre lines of legs.

36.6 Install bearings (14) in lower housings (13). Slide wheel unit shaft assemblies into lower housings.

36.7 Slide wheel unit shafts through sprockets and position lower housings on legs. Hold in position with elastic bands or tape.

36.8 Apply white bearing grease to steel balls (9), springs (8) and the MATING FACES ONLY of torque limiter sleeves (7) and wheel shaft sprockets (11). Install two springs and two steel balls in each

torque limiter sleeve and slide the sleeves onto the wheel unit shafts. Secure with retained shim washers (5) and new circlips (4). Tighten locking screw (6).

36.9 Set the crab/steer changeover mechanism to CRAB (selector button down).

36.10 Referring to Fig 6.11, connect the ends of the fixed leg steering chain (3) together using joining link (5), ensuring chain does not disengage from the sprocket shaft (1). Turn the chain until crab/steer changeover mechanism engages. DO NOT cause folding leg shafts to turn.

36.11 Referring to Fig 6.8, install chain adjuster rod (26), chain adjuster wedge (23) and spacing sleeve (24) in the fixed leg, holding wedge temporarily with a suitable screw and large washer.

36.12 If bearings (12) and (14) were removed, push them into sprocket (13). Hook sprocket into chain so that when chain is pulled taut, countersunk holes in sprocket are in line with centre line of leg.

36.13 Install bearing (16) in lower housing (15). Slide wheel unit shaft (17) into lower housing.

36.14 Slide wheel unit shaft through wheel shaft sprocket (13) and position lower housing on fixed leg. Hold housing in position with elastic bands or tape.

36.15 Apply white bearing grease to steel balls (11), springs (10) and the MATING FACES ONLY of the torque limiter sleeve (9) and wheel shaft sprocket (13). Install two springs and two steel balls in torque limiter sleeve and slide the sleeve onto the wheel unit shaft. Secure with retained shim washers (7) and new circlip (6). Tighten locking screw (8).

36.16 Turn skid assembly upside-down and extend the folding legs.

36.17 Referring to Fig 6.7, lubricate `O' rings (33), `O' ring (35), brake rod detent disc (31), brake button (32) and brake detent sleeve (34) with white bearing grease and install in each braked end upper housing (2). Secure with shaft bearing disc (29) and new circlip (28).

36.18 Hold braked end upper housings upside-down and insert steel ball (30) in brake buttons and special nut (40) in housings. Ensure pointed corners of nut are towards casting. Position upper housings on folding legs.

36.19 Degrease screw (1), screws (27) and contact areas on braked end upper and lower housings.

36.20 Remove elastic bands/tape from braked end lower housings. Remove temporary screws and washers retaining wedges in folding legs.

36.21 Position upper housings on folding legs. Using Loctite 221 under screw heads, install screw (1) in chain adjuster wedges (37) and screws (27) to connect upper and lower housings. Do not tighten screws at this stage.

36.22 Referring to Fig 6.8, lubricate shaft bearing disc (4) with white bearing grease and install in tiller end upper housing (2) and secure with new circlip (5).

36.23 Hold tiller end upper housing upside-down and insert special nut (27) in housing. Ensure pointed corners of nut are towards casting.

36.24 Degrease two screws (22), screw (28) and contact areas on tiller end upper and lower housings.

36.25 Remove elastic bands/tape from tiller end lower housing. Remove temporary screw and washer retaining wedge in fixed leg.

36.26 Position upper housing on fixed leg. Using Loctite 221 under screw heads, install screw (28) in chain adjuster wedge (23) and screws (22) to connect upper and lower housings. Do not tighten screws at this stage.

36.27 Install tiller blanking cap (1) in tiller end housing.

36.28 At each end housing, push housing units onto legs, then pull out to maximum travel, thus taking up slack in steering chain. Tighten one securing screw (22 or 27) while holding chain taut.

36.29 Carefully tighten each adjuster wedge screw (1 or 28) until resistance is felt.

36.30 Slacken securing screws (22 or 27) and tighten adjuster wedge screws (1 or 28) one half turn only.

36.31 Tighten all securing screws and take up any slack in adjuster wedge screws, but do not over tighten.

36.32 Install an `O' ring and wheel pivot block on each wheel unit shaft. Secure each wheel pivot block with two screws.

36.33 Set crab/steer changeover mechanism to STEER and set the folding legs to the narrow doorway track width.

36.34 Turn one folding leg wheel pivot block until it locks. Turn the block backwards and forwards, at the same time observing the main drive chain at the inner end of the leg. This will be seen to rise and fall laterally.

36.35 Still turning the wheel pivot block backwards and forwards, slowly screw in the chain tension grub screw (Fig 6.11 item 14) until lateral movement of the main drive chain stops. Screw in the grub screw a further half turn. The main drive chain is now correctly tensioned. Install hole plug (Fig 6.9 item 15).

36.36 Perform tracking adjustment (Section 4).

36.37 Referring to Fig 6.6, install a foot support assembly (9) on each end housing unit. Degrease thread of screw (12) and coat with Loctite 221. Loosely install screw (11) and screw (12).

36.38 Install a pedestal in the skid and adjust the position of the foot supports using the struts. Tighten screws (11) to 5.6 Nm (50 lbf in.). Tighten screws (12).

36.39 Referring to Fig 6.6, install cable clamp assembly (21) to tiller end housing and secure with two screws (20).

Section 6

Illustrated Parts List

Contents

Illustrations

Introduction

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

2 This parts list is applicable to pedestals from Serial No. 1261 onwards. For pedestals with an earlier Serial No., please contact Vinten Broadcast Limited or your local distributor.

Ordering spare parts

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 6.13 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 part number is quoted when ordering main assemblies

Assembly	Part No.
Osprey Plus Two-stage pedestal (OB)	3328-3B
Osprey Plus Two-stage pedestal (Studio)	3328-3C
Skid assembly (OB)	3329-11B
Skid assembly (Studio)	3329-11C
Column assembly	3328-11
Wheel unit (Studio) (Three per skid)	3329-40
Wheel unit (OB - braked) (Two per skid)	3329-19
Wheel unit (OB - tiller) (One per skid)	3329-20
Kick ring	3329-32

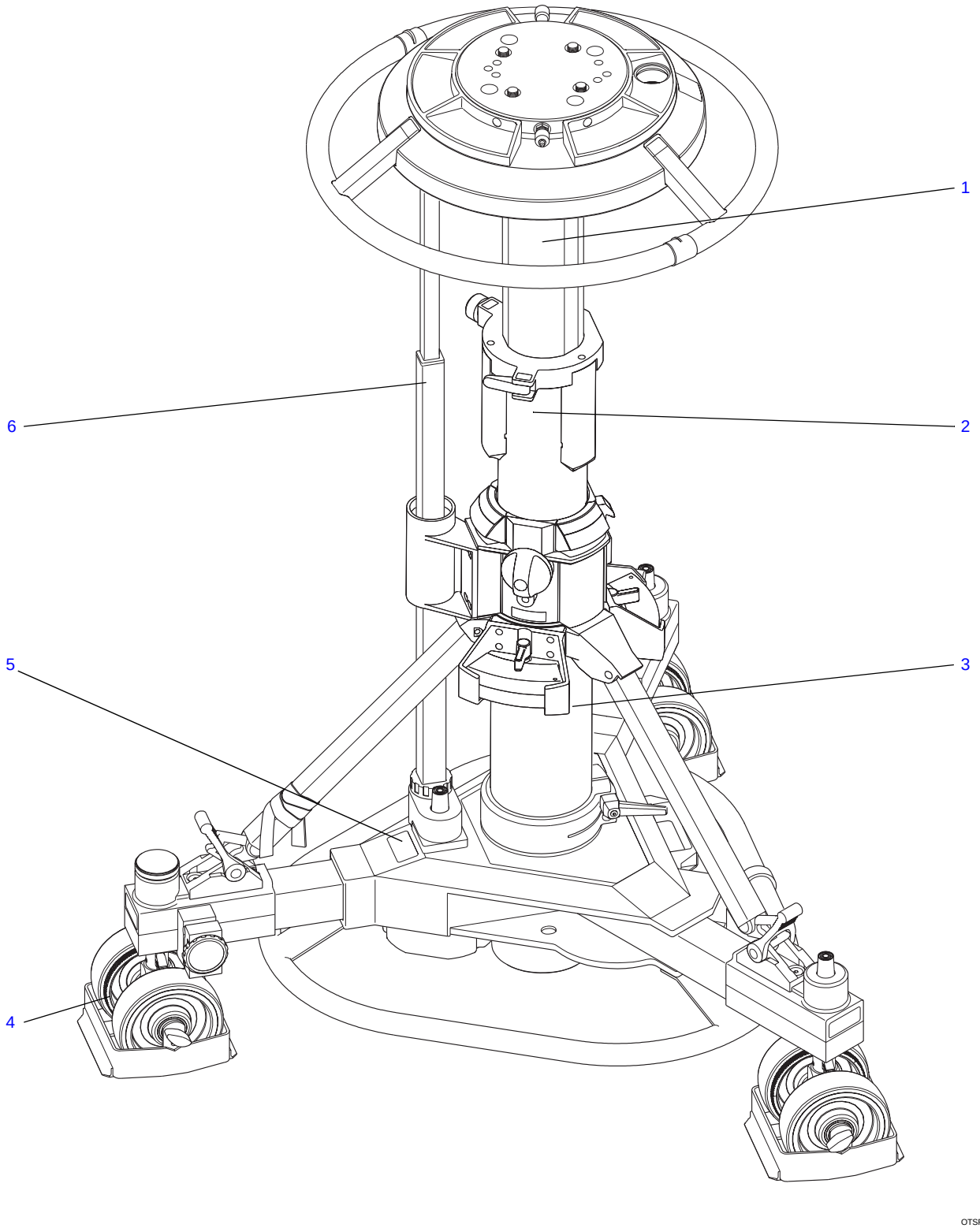

Fig 6.1 Osprey Plus Two-Stage Pedestal

Fig 6.1 Osprey Plus Two-Stage Pedestal

Item	Nomenclature
1	Top stage (Fig 6.2)
2	Elevation tube (Fig 6.3)
3	Outer tube (Fig 6.4)
4	Wheels and cableguards (Fig 6.12)
5	Skid (Fig 6.6, Fig 6.7, Fig 6.8, Fig 6.9, Fig 6.10 and Fig 6.11)
6	Steering column assembly (Fig 6.5)

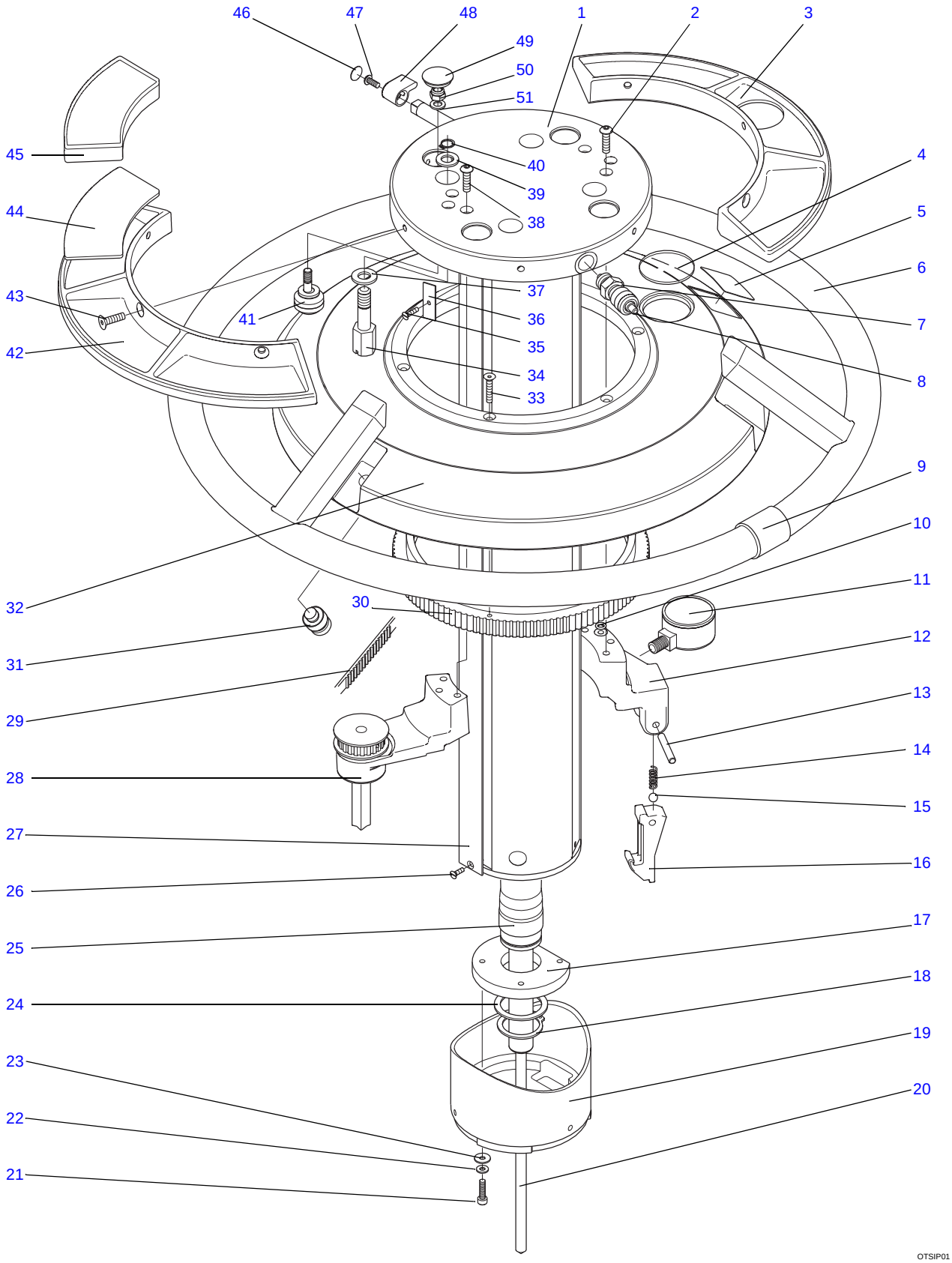

Fig 6.2 Osprey Plus Two-Stage Pedestal - Top Stage

Fig 6.2 Osprey Plus Two-Stage Pedestal - Top Stage

Item	Part No.	Nomenclature	Qty
1	3328-40	Tank assembly, includes items 2, 7, 8, 10, 11, 12, 25, 26, 27, 35, 36, 46, 47 and 48	1
2	M006-714*	Screw, skt cap hd, M5 x 25 mm lg	3
3	3328-313	Weight tray, LH	1
4	3328-258	Perspex disc	1
5	3328-390	Pressure warning label	1
6	3374-17	Steering ring assembly	1
7	3328-303	Schrader valve	1
8	3328-304	Pressure release button	1
9	3328-29	Indicator assembly	2
10	Q001-011	'O' ring, 3/16 in. ID x 1/16 in. sect	1
11	3328-393	Pressure gauge	1
12	3328-210	Catch bracket	1
13	3328-251	Catch lever spindle	1
14	J532-089	Spring, 5/32 in. x 1/4 in. x 3/4 in. lg	1
15	N600-016	Steel ball, 1/4 in. dia	1
16	3328-209	Catch lever	1
17	3328-220	Piston end ring	1
18	M701-036	External circlip, 30 mm shaft	1
19	-	Elevation tube (Fig 6.3)	
20	3328-305 3328-306 3328-307 3328-385	Gas strut, 450N, or Gas strut, 360N, or Gas strut, 270N, or Gas strut, 600N,	1
21	M005-706	Screw, skt cap hd, M4 x 16 mm lg	4
22	M600-005	Washer, M4, heavy	4
23	L602-051	Washer, 2BA	4
24	3328-310	Shim, 0.003 in. thick	A/R
25	3328-39	Tapered ram assembly	1
26	M004-222	Screw, csk slotted hd, M3 x 8 mm lg	3
27	3328-355	Track	3
28	3328-19	Steering column assembly (Fig 6.5)	1
29	J201-043	Timing belt	1

Fig 6.2 Osprey Plus Two-Stage Pedestal - Top Stage (Cont)

Item	Part No.	Nomenclature	Qty
30	3374-308	Steering gear (‘V’ groove)	1
	3374-19	Steering ring hub assembly, comprising:	1
31	L860-065	Fastener	4
32	3374-232	Steering hub	1
33	M005-914	Screw, skt csk hd, M4 x 20 mm lg	6
34	3328-350	Fixing shaft	4
35	M004-221	Screw, csk slotted hd, M3 x 8 mm lg	3
36	3328-357	Track clamp plate	3
37	L602-123	Washer, 3/8 in.	4
38	M006-714	Screw, skt cap hd, M5 x 25 mm lg	3
39	3064-227	Washer	4
40	L701-025	Circlip, 3/8 in. shaft	4
41	3374-33	‘V’ bearing and shaft assembly	4
42	3328-314	Weight tray RH	1
43	M006-904	Screw, skt csk hd, M5 x 16 mm lg	6
44	3328-344	Lining, weight tray	6
45	3429-17	Trim weight (Part of 3328-25 - Fig 6.4)	6
46	3328-329	Knob cover	1
47	M005-503	Screw, skt butt hd, M4 x 8 mm lg	1
48	3328-328	Knob	1
49	J550-068	Hole plug	4
50	M501-206	Nyloc nut, M6	4
51	M600-007	Washer, M6, heavy	4

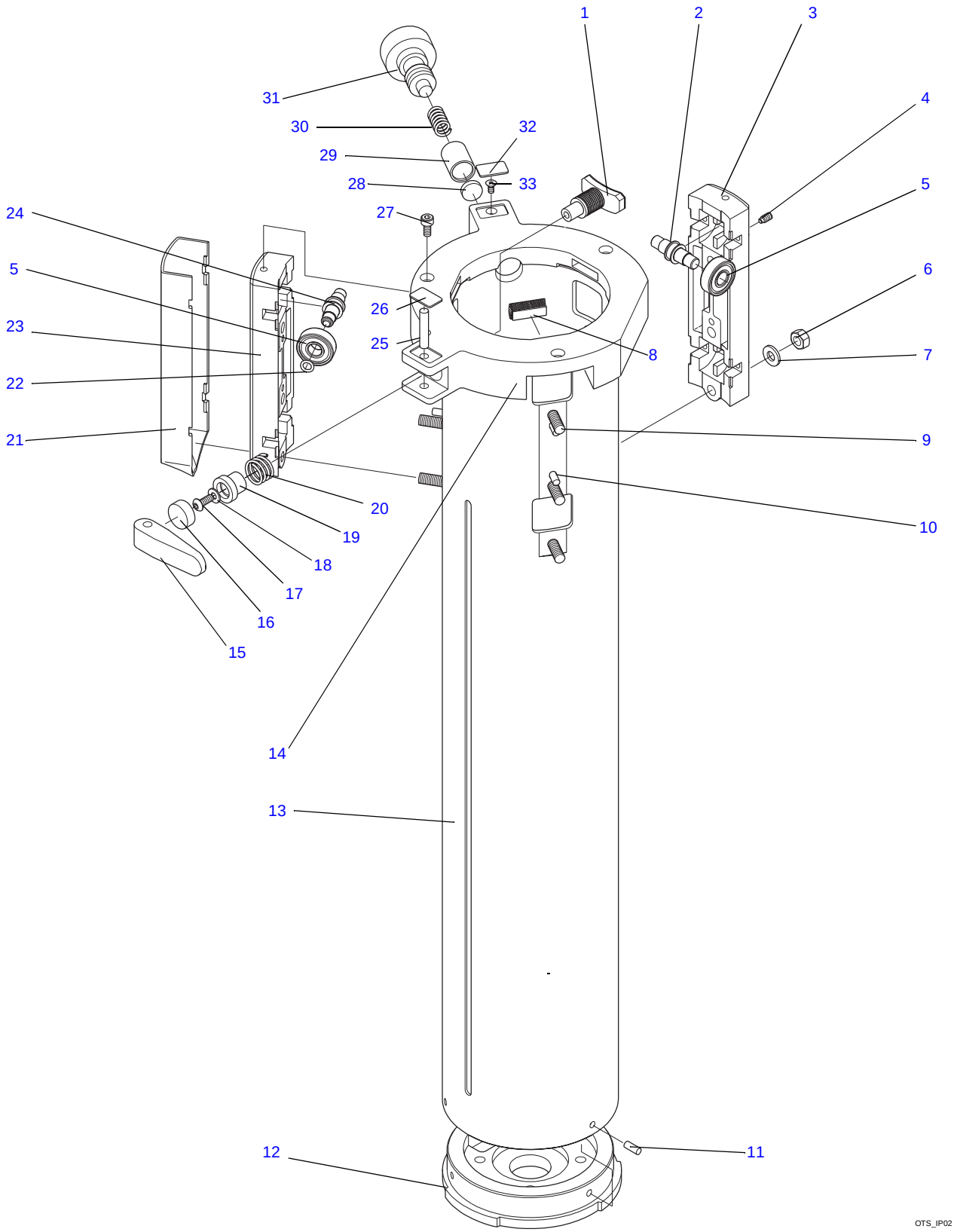

Fig 6.3 Osprey Plus Two-Stage Pedestal - Elevation Tube

Fig 6.3 Osprey Plus Two-Stage Pedestal - Elevation Tube

Item	Part No.	Nomenclature	Qty
1	3328-903SP*	On-shot clamp assembly	1
2	3328-360	Roller shaft	2
3	3328-358	Roller housing, adjustable	1
4	M005-803	Grubscrew, skt dog point, M4 x 8 mm lg	4
5	P300-012	Roller bearing, 8 mm ID x 22 mm OD x 7 mm wide	12
6	M500-090	Nut, full, M6	9
7	M605-004	Washer, fibre, M6	9
8	3328-287	Wiper	3
9	M100-002	Captive stud, M6 x 18 mm lg	9
10	M801-006	Dowel pin, 4 mm dia x 10 mm lg	6
11	M806-004	Spirol pin, 4 mm dia x 10 mm lg	3
12	3328-226	Bottom end plate, elevation tube	1
	3328-27	Elevation tube/clamp housing assembly, comprising:	1
13	3328-359	Elevation tube	1
14	3328-207	Tank tube clamp housing	1
15	3328-252	Clamp lever	1
16	3328-341	End cap	1
17	M005-513	Screw, skt butt hd, M4 x 6 mm lg	1
18	M600-005	Washer, M4	1
19	3328-239	Clamp spring plunger	1
20	J532-136	Spring	1
21	3328-204	Roller housing cover	3
22	Q001-007*	'O' ring	8
23	3328-356	Roller housing, fixed	2
24	3328-370	Roller shaft	4
25	M801-009	Dowel pin, 5 mm dia x 25 mm lg	1
26	3328-315	Lock label	1
27	M005-718	Screw, skt cap hd, M4 x 12 mm lg	3
28	3328-309	Friction pad	1
29	3328-308	Drag pad	1
30	J532-058	Spring	1

Fig 6.3 Osprey Plus Two-Stage Pedestal - Elevation Tube (Cont)

Item	Part No.	Nomenclature	Qty
31	3328-277	Clamp screw	1
32	3328-316	Drag label	1
33	M004-101	Screw, Pozi csk hd, M3 x 5 mm lg	1

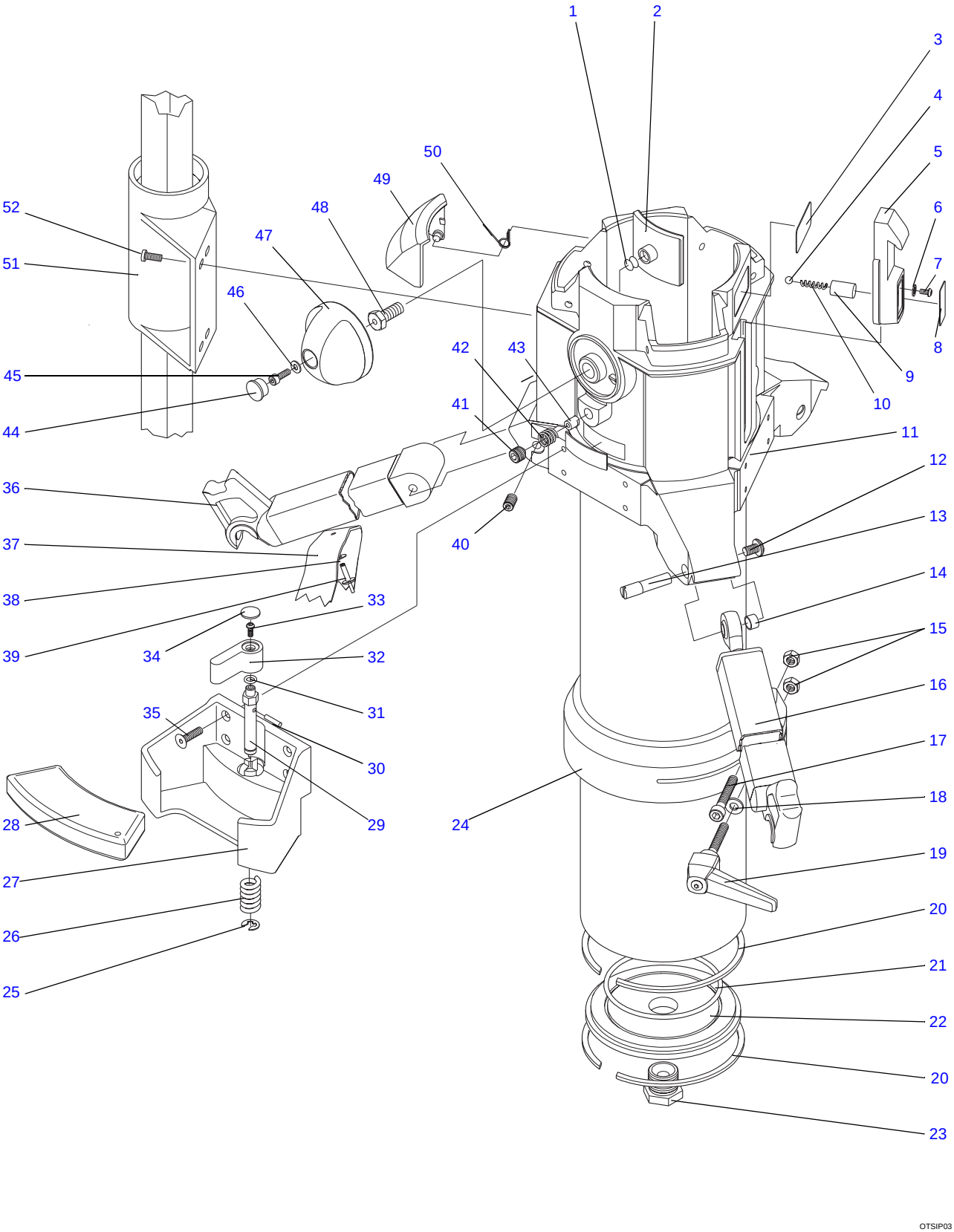

Fig 6.4 Osprey Plus Two-Stage Pedestal - Outer Tube

Fig 6.4 Osprey Plus Two-Stage Pedestal - Outer Tube

Item	Part No.	Nomenclature	Qty
1	3320-240	Shim	2
2	3328-26	Clamp assembly	1
3	3328-338	Warning label	1
4	P900-010	Steel ball, 5 mm dia	1
5	3328-208	Catch	1
6	M600-003	Washer, M3	2
7	M004-512	Screw, skt butt hd, M3 x 6mm lg	2
8	3328-294	Catch label	1
9	3328-240	Spring sleeve catch	1
10	J532-073	Spring, compression	1
11	3328-13	Top housing assembly	1
12	M006-015	Screw, Pozi pan hd, m5 x 8 mm lg	2
13	3328-282	Strut pivot shaft	2
14	3328-283	Pivot shaft sleeve	2
15	M500-090	Nut, M6	2
16	3328-15	Strut assembly, short	2
17	M007-723	Screw, skt cap hd, M6 x 40 mm lg	1
18	M600-007	Washer, M6	1
19	J402-046	Clamp lever	1
20	P606-004	Internal snap ring, 108 mm bore	2
21	R900H069*	‘O’ ring, 75 mm ID x 81 mm OD x 3 mm sect	1
22	3328-223	Outer tube end plug bottom	1
23	3328-225	Threaded end plug	1
24	3328-31	Skid clamp assembly	1
	3328-25	Trim weight/pocket assembly, each comprising:	3
25	M701-018	Circlip, 8 mm shaft	1
26	J532-054	Spring	1
27	328-326	Pocket	1
28	3429-17	Trim weight assembly	2
29	3328-327	Clamp lever shaft	1
30	M801-033	Dowel pin, 3 mm dia x 14 mm lg	1

Fig 6.4 Osprey Plus Two-Stage Pedestal - Outer Tube (Cont)

Item	Part No.	Nomenclature	Qty
31	Q001-010*	'O' ring, 1/4 in. x 3/8 in. x 1/16 in.	1
32	3219-225	Clamp knob	1
33	M004-503	Screw, skt butt hd, M3 x 8 mm lg	1
34	3390-227	Brake knob cap	1
35	M005-904	Screw, skt csk hd, M4 x 16 mm lg	12
36	3328-14	Strut assembly, fixed, including:	
37	3328-378	Strap	1
38	L602-041	Washer, 4 BA	1
39	L804-126	Pop rivet	1
40	M007-816	Grub screw, skt hd, cone point, M6 x 10 mm lg	2
41	M008-812	Grub screw, skt hd, cup point, M8 x 8 mm lg	1
42	J532-128	Spring	1
43	3328-349	Guide pin	1
44	J550-081	Hole plug	1
45	M005-718	Screw, skt cap hd, M4 x 12 mm lg	1
46	M601-006	Washer, shakeproof, M4	1
47	3320-217	Clamp knob	1
48	3328-348	Clamp knob spindle	1
49	3328-203	Top housing cover	3
50	3328-205	Top housing cover spring	3
51	3328-19*	Steering column assembly (Fig 6.5)	1
52	M005-735*	Screw, low profile skt cap hd, M4 x 12 mm lg	4

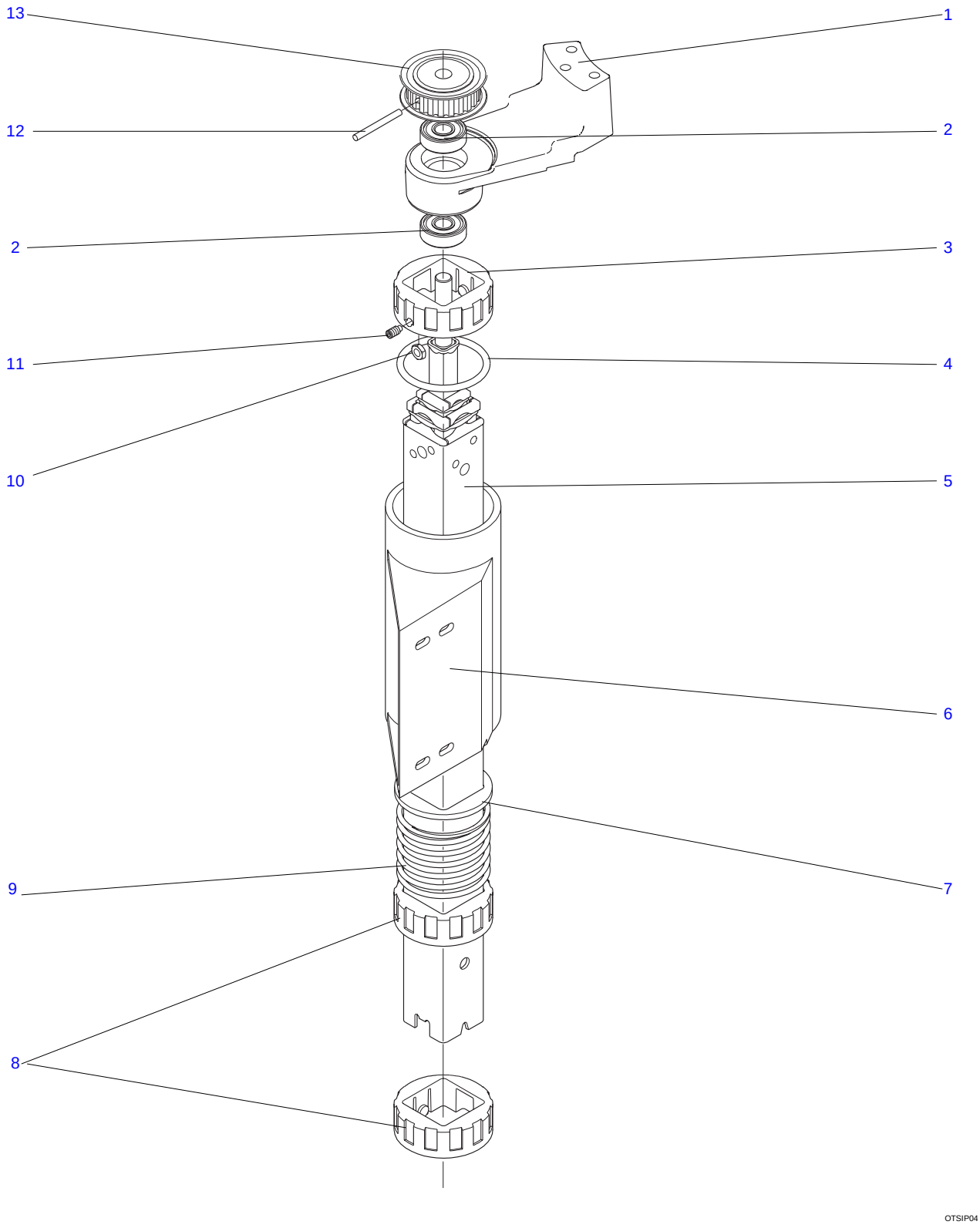

Fig 6.5 Osprey Plus Two-Stage Pedestal - Steering Column Assembly

Fig 6.5 Osprey Plus Two-Stage Pedestal - Steering Column Assembly

Item	Part No.	Nomenclature	Qty
1	3328-211	Drive adaptor bracket	1
2	P300-012	Bearing, 8 mm x 22 mm x 7 mm	2
3	3328-364	Sleeve, steering tube bearing, upper	1
4	Q001-051*	‘O’ ring, 1/58 in. ID x 1/8 in. section	1
5	3328-18	Steering tubes assembly	1
6	3328-279	Steering column support bracket	1
7	3328-298	Disc, spring thrust	1
8	3328-278	Sleeve, steering tube bearing	2
9	3328-299	Spring, steering tube loading	1
10	M500-072	Lock nut, M4	2
11	M005-814	Grub screw, M4 x 6 mm lg	2
12	M801-027	Dowel pin, 3 mm dia x 30 mm lg	1
13	3328-264	Steering pulley	1

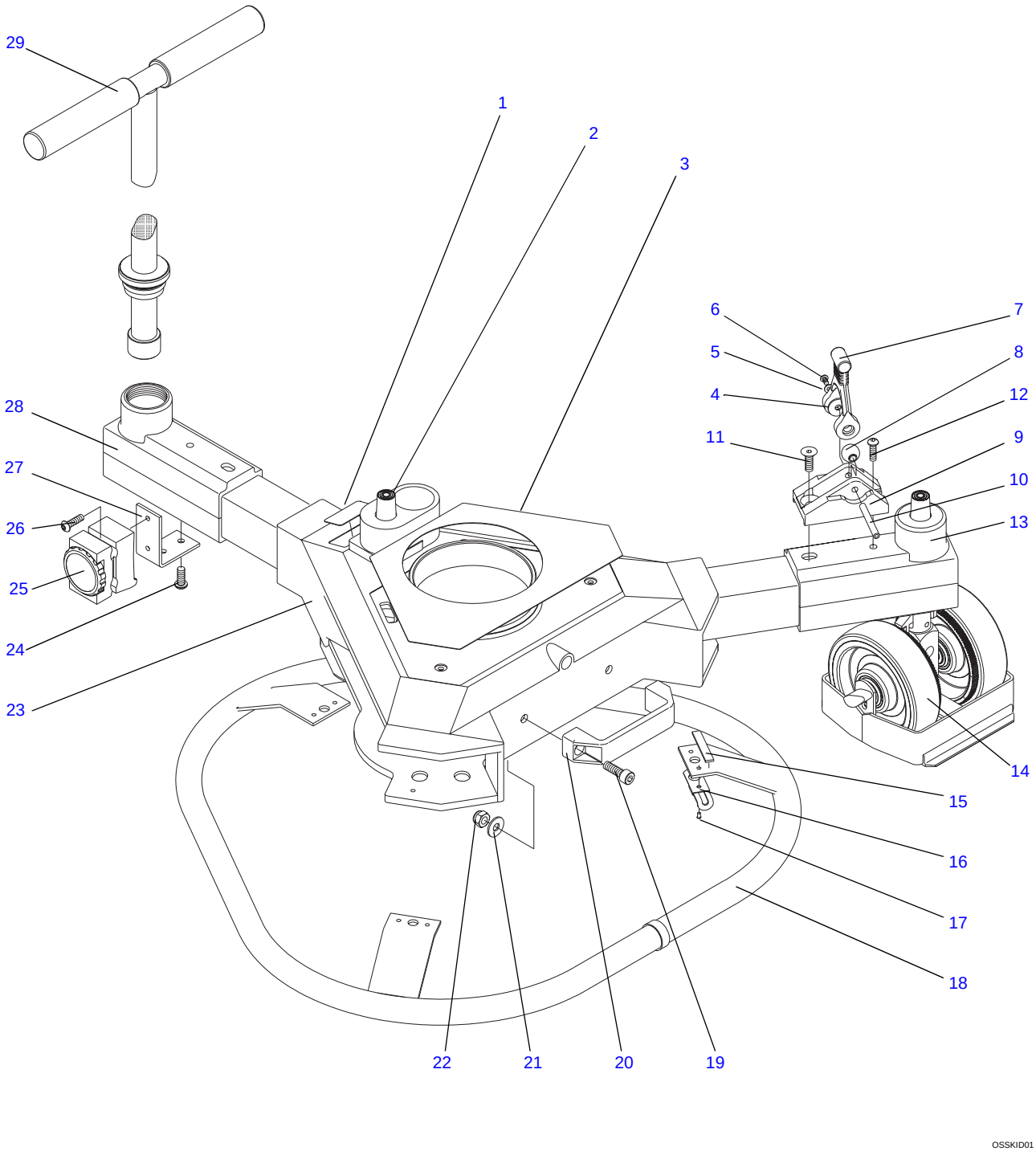

Fig 6.6 Osprey Plus Two-Stage Pedestal - Skid

Fig 6.6 Osprey Plus Two-Stage Pedestal - Skid

Item	Part No.	Nomenclature	Qty
1	3329-261	Label, changeover button	1
2	—	Crab/steer changeover mechanism (Fig 6.9)	
3	3329-245	nameplate	1
	3329-31	Foot support assembly, comprising:	3
4	3313-208	Washer	2
5	M600-004	Washer, plain	2
6	M005-511	Screw, skt butt hd, M4 x 6 mm lg	2
7	3316-14	Strap assembly	1
8	3313-207	Sphere, foot locating	1
9	3315-201	Foot support	1
10	3315-202	Shaft	1
11	L078-007	Screw, skt csk hd, 3/8 in. UNC x 3/4 in. lg	3
12	M007-501	Screw, skt butt hd, M6 x 10 mm lg	3
13	—	Braked end housing (Fig 6.7)	
14	—	Wheels (Fig 6.12)	
	3329-32	Kick ring assembly, comprising:	1
15	Z001-059	Foam strip	A/R
16	L860-053	Slide latch	3
17	L804-157	Rivet, steel snap hd, 1/8 in. dia x 3/16 in. lg	6
18	3329-33	Kick ring (weld) assembly	1
19	M008-720	Screw, skt cap hd, M8 x 25 mm lg	2
20	J402-050	Handle	1
21	M600-308	Washer, large plain, M8	2
22	M501-016	Nut, Nyloc, M8	2
23	—	Legs and pivots (Fig 6.10), Chains (Fig 6.11)	
24	M007-502	Screw, skt butt hd, M6 x 12 mm lg	2
25	3382-3	Cable clamp assembly, including:	1
26	M006-514	Screw, skt butt hd, M5 x 16 mm lg	2
27	3382-205	Mounting plate	1
28	—	Tiller end housing (Fig 6.8)	
29	3329-21	Steering tiller assembly	1

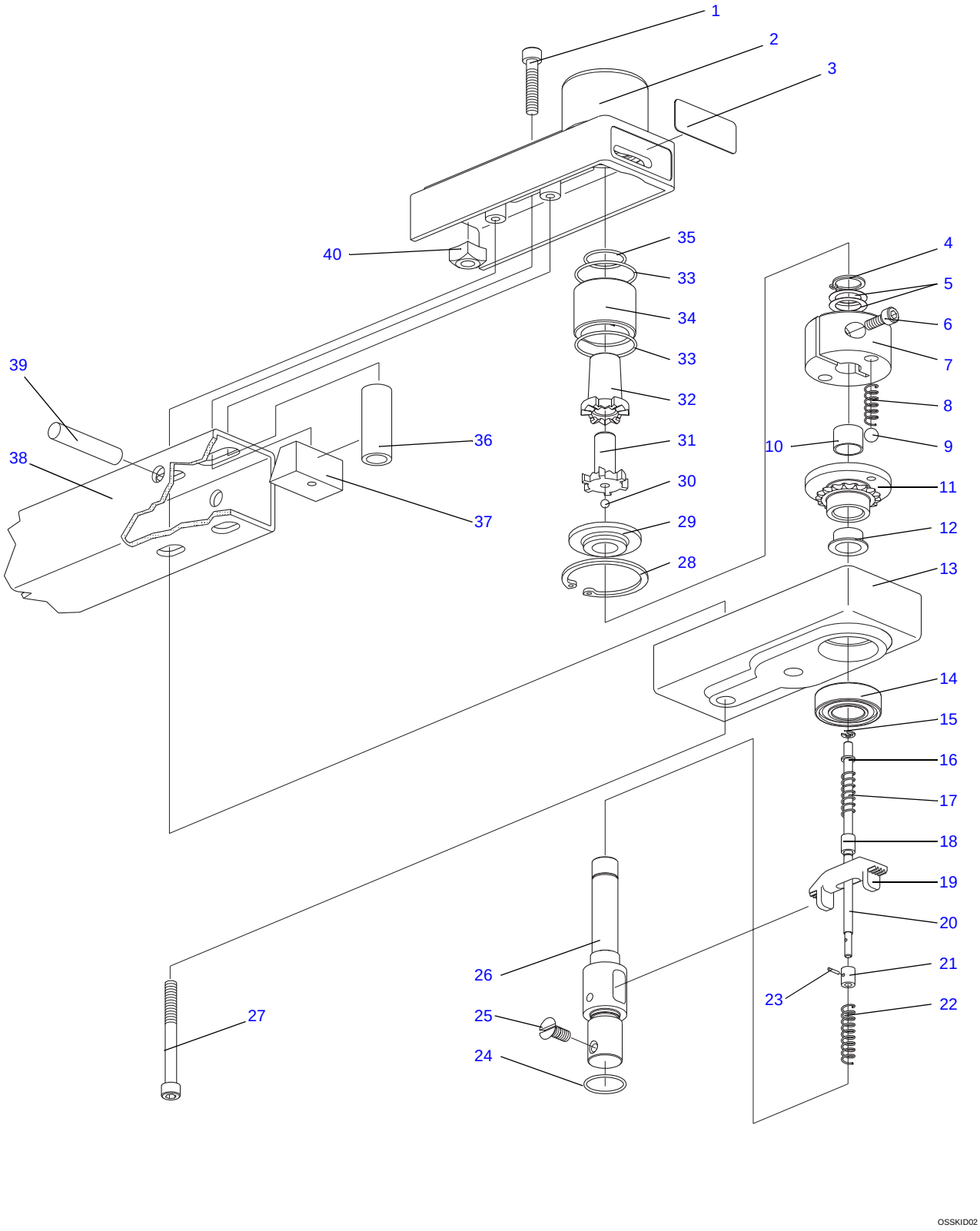

Fig 6.7 Osprey Plus Two-Stage Pedestal - Skid - Braked End Housing

Fig 6.7 Osprey Plus Two-Stage Pedestal - Skid - Braked End Housing

Item	Part No.	Nomenclature	Qty
1	M007-720	Screw, skt cap hd, M6 x 30 mm lg	1
2	3329-201	Housing, wheel unit, upper braked	1
3	3329-291	Label, wheel housing	1
4	M701-009	Circlip, external, 15 mm dia shaft	1
5	M602-001	Shim washer	A/R
6	M006-706	Screw, skt cap hd, M5 x 25 mm lg	1
7	3329-207	Sleeve, torque limiter	1
8	J532-125	Spring, compression, 5/16 in. OD x 18swg x 1 in. lg	2
9	N600-017	Steel ball, 5/16 in. dia	2
10	P001-005	Bearing, plain, 15 mm x 17 mm x12	1
11	3329-206	Sprocket, wheel shaft	1
12	P001-008	Bearing, plain flanged, 15 mm x 17 mm x19	1
13	3329-203	Housing, wheel unit, lower	1
14	P200-240	Bearing, single row ball, 17 mm x 35 mm 10 mm	1
15	M701-017	'E' clip, 4 mm dia shaft	1
16	3329-284	Washer, spring thrust	1
17	J532-143	Spring, compression, 5/16 in. OD x 19swg x 1 1/4 in. lg	1
18	D496-015	Spacer, 8 mm x 5.3 mm x 10 mm	1
19	3329-211	Bar, brake	1
20	3329-210	Push rod, brake actuation	1
21	3429-284	Sleeve	1
22	J532-131	Spring, compression, 5/16 in. OD x 22swg x 1 1/2 in. lg	1
23	L800-015	Spirol pin, 1/16 in. dia x 5/16 in. lg	1
24	R900H028*	'O' ring, 15.6 mm ID x 20.4 mm OD x 2.4 mm dia	1
25	M007-150	Screw, csk slotted hd, M6 x 14 mm lg	2
26	3329-204	Shaft, wheel unit braked	1
27	M007-718	Screw, skt cap hd, M6 x 60 mm lg	2
28	M700-019	Circlip, internal, 42 mm housing	1
29	3329-217	Disc, wheel unit shaft bearing	1
30	N600-001	Steel ball, 3/16 in. dia	1
31	3329-212	Disc, brake rod detent	1

Fig 6.7 Osprey Plus Two-Stage Pedestal - Skid - Braked End Housing (Cont)

Item	Part No.	Nomenclature	Qty
32	3329-209	Button, brake actuation	1
33	R900H012*	'O' ring, 33 mm ID x 36 mm OD x 1.5 mm dia	2
34	3329-213	Sleeve, brake button detent	1
35	R900H011*	'O' ring, 20 mm ID x 23 mm OD x 1.5 mm dia	1
36	3329-276	Sleeve, wheel housing spacing	1
37	3329-281	Wedge, chain adjuster	1
38	3329-275	Tube, folding leg (Fig 6.10)	1
39	3329-282	Rod, chain adjuster	1
40	3329-298	Square nut, modified	1

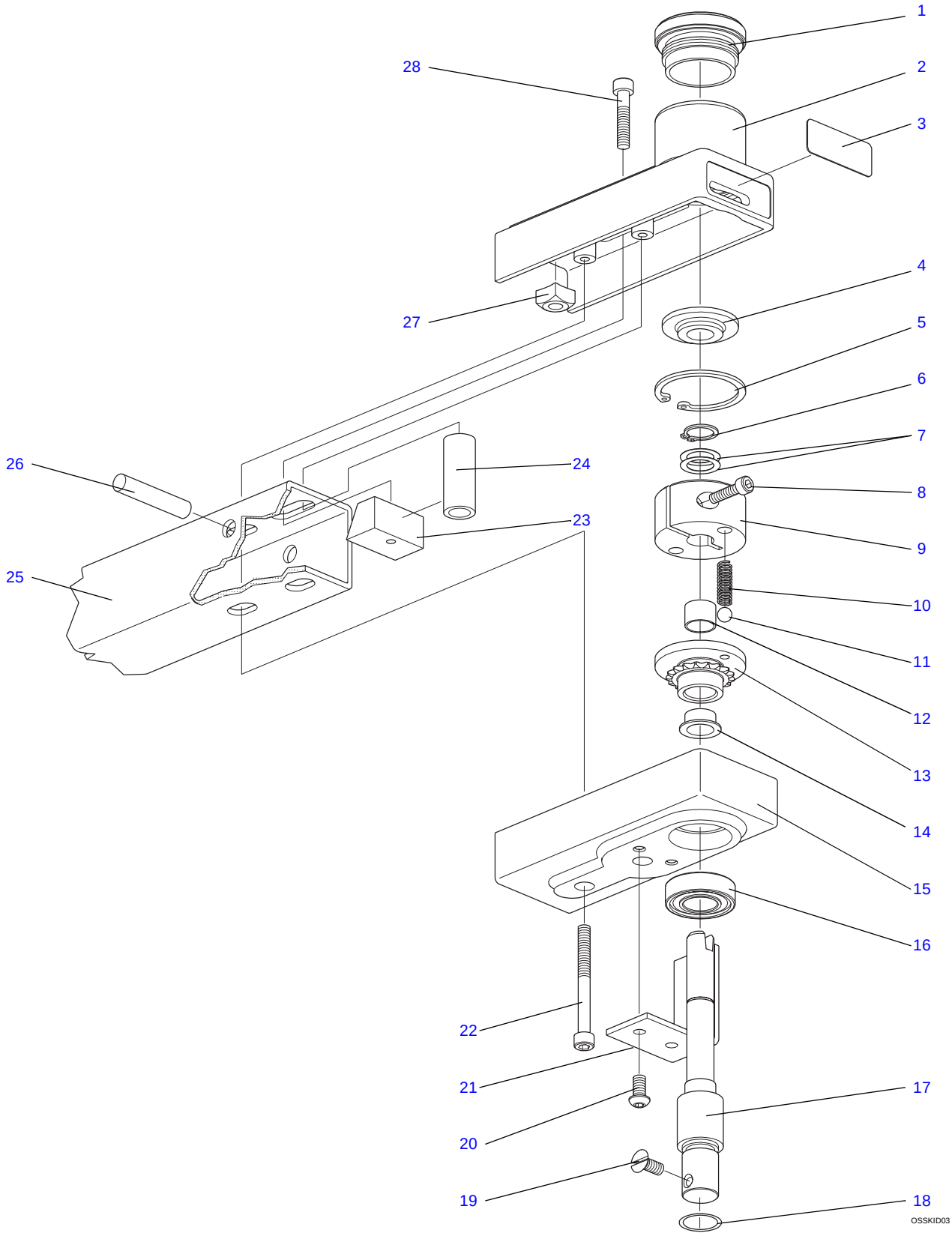

Fig 6.8 Osprey Plus Two-Stage Pedestal - Skid - Tiller End Housing

Fig 6.8 Osprey Plus Two-Stage Pedestal - Skid - Tiller End Housing

Item	Part No.	Nomenclature	Qty
1	3329-253	Screw cap, hole blanking	1
2	3329-202	Housing, wheel unit, upper tiller	1
3	3329-291	Label, wheel housing	1
4	3329-217	Disc, wheel unit shaft bearing	1
5	M700-019	Circlip, internal, 42 mm housing	1
6	M701-009	Circlip, external, 15 mm dia shaft	1
7	M602-001	Shim washer	A/R
8	M006-706	Screw, skt cap hd, M5 x 25 mm lg	1
9	3329-207	Sleeve, torque limiter	1
10	J532-125	Spring, compression, 5/16 in. OD x 18swg x 1 in. lg	2
11	N600-017	Steel ball, 5/16 in. dia	2
12	P001-005	Bearing, plain, 15 mm x 17 mm x12 mm	1
13	3329-206	Sprocket, wheel shaft	1
14	P001-008	Bearing, plain flanged, 15 mm x 17 mm x19 mm	1
15	3329-324	Housing, wheel unit, lower, fixed leg	1
16	P200-240	Bearing, single row ball, 17 mm x 35 mm 10 mm	1
17	3329-205	Shaft, wheel unit tiller	1
18	R900H028*	'O' ring, 15.6 mm ID x 20.4 mm OD x 2.4 mm dia	1
19	M007-150	Screw, csk slotted hd, M6 x 14 mm lg	2
20	M007-502	Screw, skt butt hd, M6 x 12 mm lg	2
21	3382-205	Mounting, cable clamp (Fig 6.6)	1
22	M007-718	Screw, skt cap hd, M6 x 60 mm lg	2
23	3329-276	Sleeve, wheel housing spacing	1
24	3329-281	Wedge, chain adjuster	1
25	3329-274	Tube, fixed leg (Fig 6.10)	1
26	3329-282	Rod, chain adjuster	1
27	3329-298	Square nut, modified	1
28	M007-720	Screw, skt cap hd, M6 x 30 mm lg	1

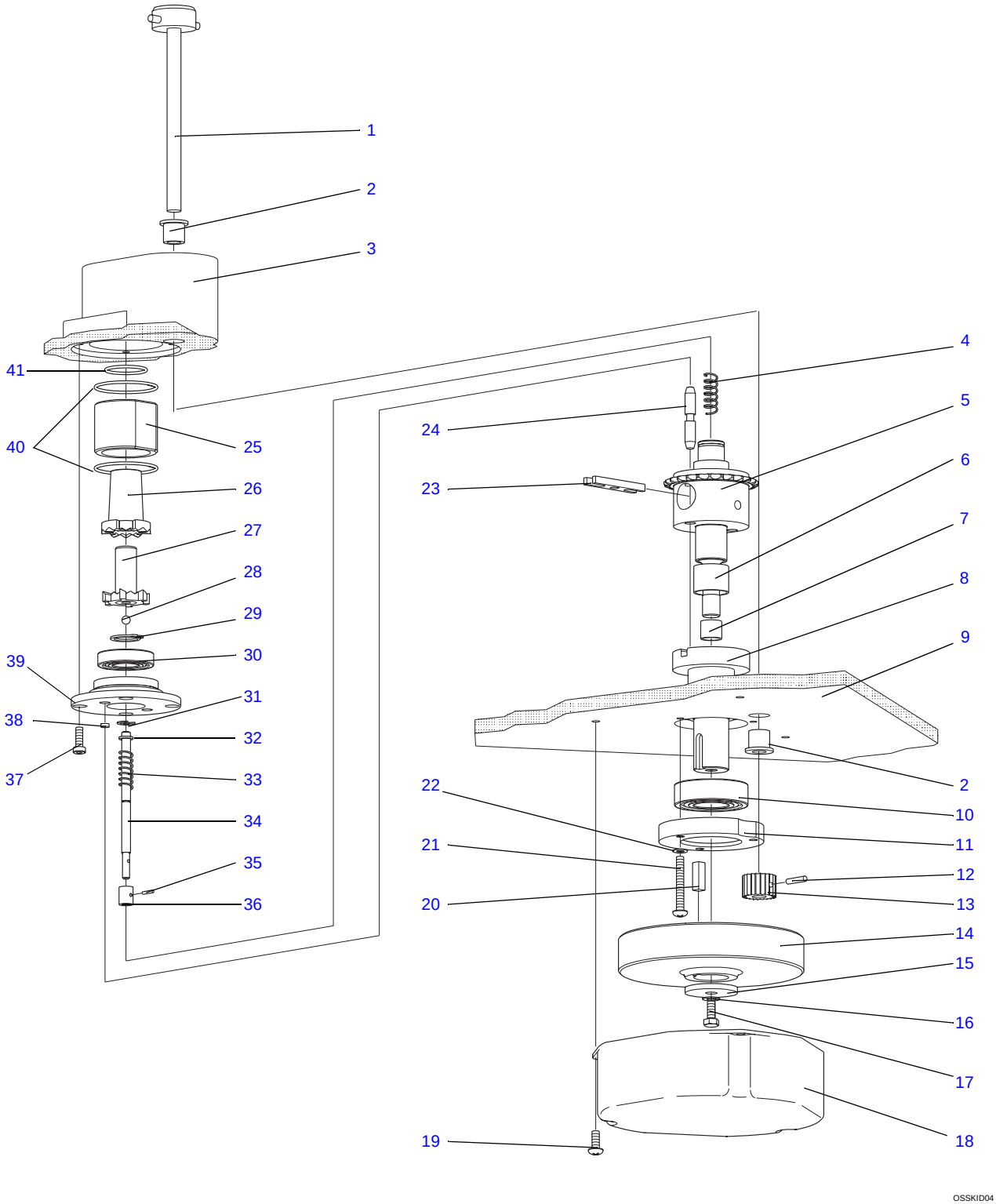

Fig 6.9 Osprey Plus Two-Stage Pedestal - Skid - Crab/Steer Changeover Mechanism

Fig 6.9 Osprey Plus Two-Stage Pedestal - Skid - Crab/Steer Changeover Mechanism

Item	Part No.	Nomenclature	Qty
1	3329-26	Steering shaft /gear sub-assembly (includes item13)	1
2	P002-014	Bearing, plain flanged, 8 mm x 12 mm x 12 mm	2
3	3329-13	Centre housing (Fig 6.11)	
4	J532-131	Spring, compression, 5/16 in. OD x 22swg x 1 1/4 in.	1
5	3329-224	Sprocket shaft, steering mechanism	1
6	P001-007	Bearing, plain, 18 mm x 20 mm x 15 mm, Glacier MB1815DU	1
7	P001-004	Bearing, plain, 10 mm x 12 mm x 10 mm, Glacier MB1010DU	1
8	3329-223	Sprocket sleeve, steering mechanism	1
9	3329-25	Base plate (Fig 6.11)	
10	P200-241	Bearing, single row ball, 20 mm x 43 mm x 12 mm	1
11	3329-229	Ring, bearing clamp	1
12	M801-033	Dowel pin, 3 mm dia x 14 mm lg	1
13	3329-221	Pinion (part of item 1)	1
14	3329-220	Internal gear, steering mechanism	1
15	3329-219	Cap, steering gear	1
16	M601-008	Washer, M6, shakeproof	1
17	M007-603	Screw, hex hd, M6 x 20 mm lg	1
18	3329-244	Cover, steering gear	1
19	M005-004	Screw, Pozi pan hd, M4 x 10 mm lg	3
20	M805-001	Key, 5 mm square x 16 mm lg	1
21	M005-007	Screw, Pozi pan hd, M4 x 20 mm lg	3
22	M601-006	Washer, M4, shakeproof	3
23	3329-226	Changeover link, steering mechanism	1
24	3329-225	Changeover pin, steering mechanism	
25	3329-213	Sleeve, brake button detent	1
26	3329-208	Button, changeover actuation	1
27	3329-212	Disc, brake rod detent	1
28	N600-017	Steel ball, 3/16 in. dia	1
29	M701-009	Circlip, external,15 mm shaft	1
30	P200-232	Bearing, single row ball, 15 mm x 32 mm x 9 mm	1
31	M701-017	'E' clip, 4 mm shaft	1

Fig 6.9 Osprey Plus Two-Stage Pedestal - Skid - Crab/Steer Changeover Mechanism (Cont)

Item	Part No.	Nomenclature	Qty
32	3329-284	Washer, spring thrust	1
33	J532-143	Spring, compression, 5/16 in. OD x 19swg x 1 1/4 in. lg	1
34	3329-227	Push rod, steering mechanism	1
35	L800-015	Spirol pin, 1/16 in. dia x 5/16 in. lg	1
36	3329-215	Sleeve, brake bar return	1
37	M005-734	Screw, low profile socket cap hd, M4 x 12 mm lg	4
38	3329-285	Pad, changeover pin buffer	2
39	3329-228	Ring, bearing housing/pin anchor	1
40	R900H012*	'O' ring, 33 mm ID x 36 mm OD x 1.5 mm section	2
41	R900H011*	'O' ring, 20 mm ID x 23 mm OD x 1.5 mm section	1

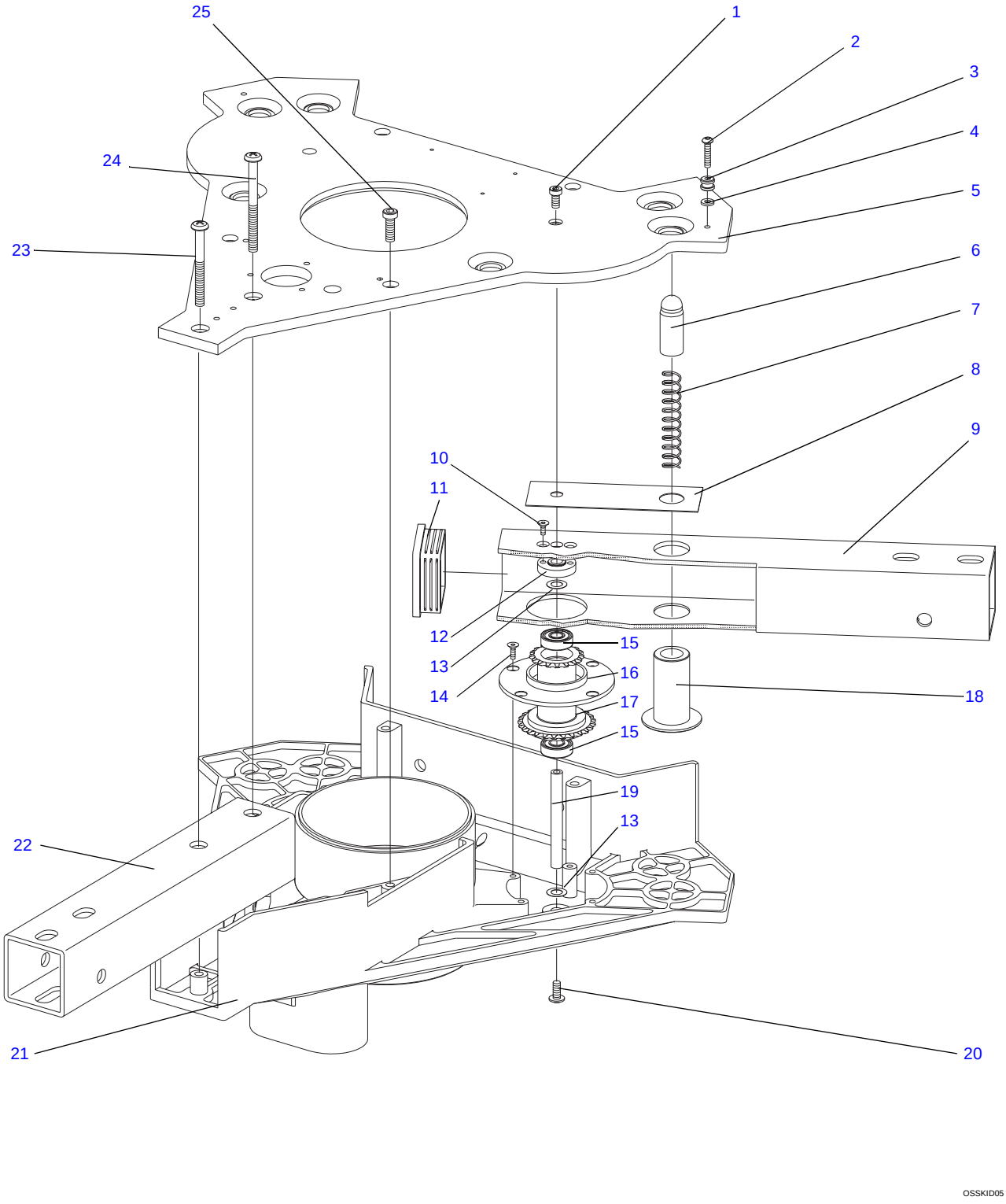

Fig 6.10 Osprey Plus Two-Stage Pedestal - Skid - Legs and Pivots

Fig 6.10 Osprey Plus Two-Stage Pedestal - Skid - Legs and Pivots

Item	Part No.	Nomenclature	Qty
1	M006-735	Screw, low profile skt cap hd, M5 x 12 mm lg	2
2	M005-514	Screw, skt butt hd, m4 x 16 mm lg	3
3	L860-052	Bush, slide catch	3
4	M606-006	Washer, nylon, Skiffy 03-4	3
5	3329-25	Base plate (rivet bush) assembly	1
6	3329-270	Plunger, leg indexing	2
7	J532-130	Spring, 15/32 in. OD x 19SWG x 3 in. lg	2
8	3329-246	Shim washer, leg pivot	2
9	3329-275	Tube, folding leg	2
10	M005-908	Screw, csk skt hd, M4 x 8 mm lg	4
11	J550-091	Tube end plug	2
12	3329-277	Spacer, leg pivot	2
13	M602-002	Shim washer	A/R
14	M005-903	Screw, csk skt hd, M4 x 12 mm lg	8
15	P300-012	Bearing, 8 mm x 22 mm x 7 mm	4
16	3329-278 3329-279	Flanged sleeve, leg pivot (RH) Flanged sleeve, leg pivot (LH)	1 1
17	3329-240	Sprocket sleeve, leg pivot	2
18	3329-272	Plunger housing	2
19	3329-241	Spindle, leg pivot	2
20	M006-550	Screw, skt flanged butt hd, M5 x 12 mm lg	2
21	3329-13	Centre housing (heli-coil) assembly	1
22	3329-274	Tube, fixed leg	1
23	M007-013	Screw, Pozi pan hd, M6 x 50 mm lg	1
24	M007-014	Screw, Pozi pan hd, M6 x 60 mm lg	1
25	M007-729	Screw, low profile skt cap hd, M6 x 16 mm lg	4

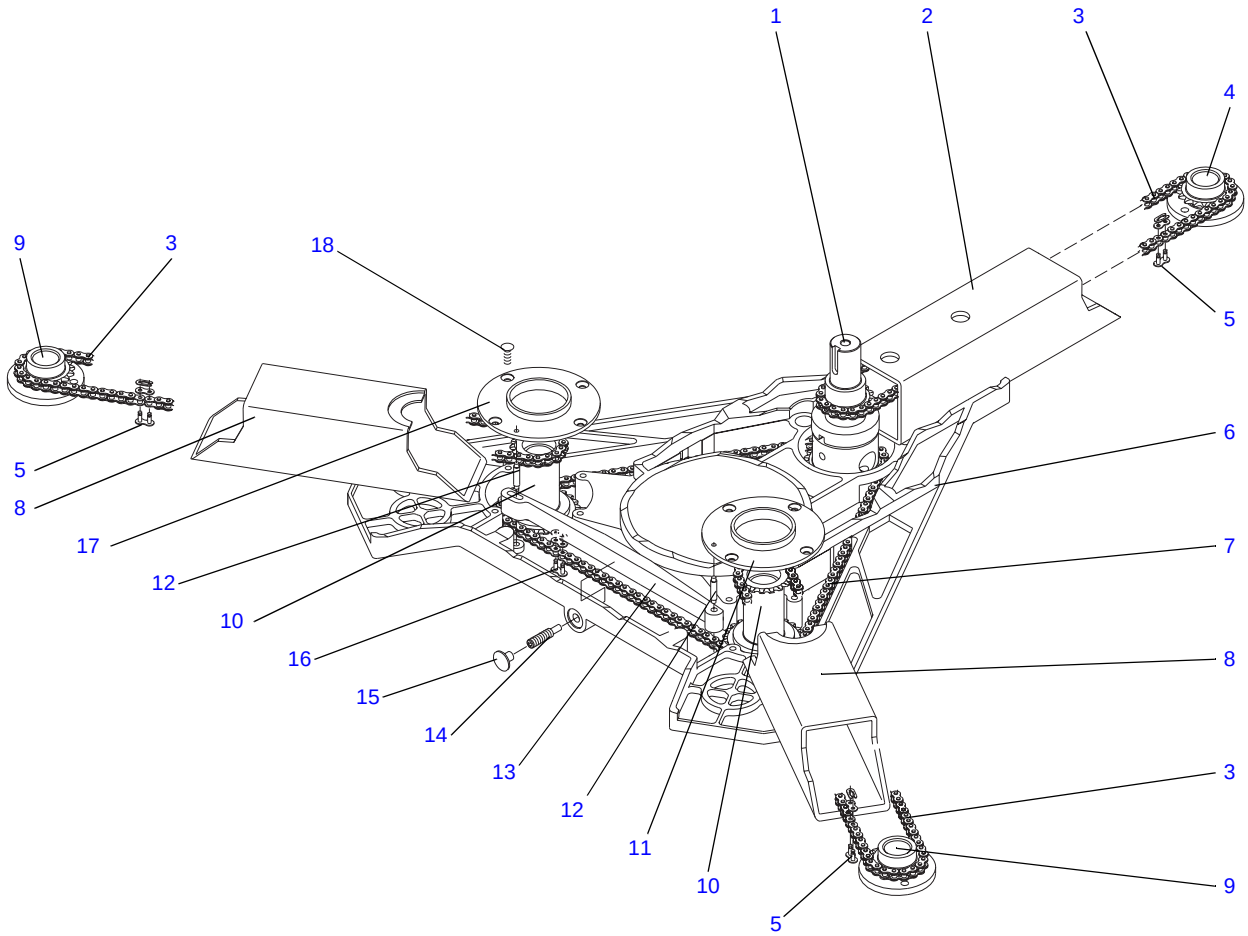

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Fig 6.11 Osprey Plus Two-Stage Pedestal - Skid - Chains

Fig 6.11 Osprey Plus Two-Stage Pedestal - Skid - Chains

Item	Part No.	Nomenclature	Qty
1	3329-224	Sprocket shaft, steering mechanism (Fig 6.9)	1
2	3329-274	Tube, fixed leg (Fig 6.10)	1
3	J202-051	Bush chain, 1/4 in. pitch, 121 links	3
4	3329-206	Sprocket, wheel shaft, tiller end housing (Fig 6.8)	1
5	J202-059	Joining link, 1/4 in. pitch	3
6	3329-13	Centre housing (Heli-coil) assembly (Fig 6.10)	1
7	J202-052	Bush chain, 1/4 in. pitch, 123 links	1
8	3329-275	Tube, folding leg (Fig 6.10)	2
9	3329-206	Sprocket, wheel shaft, braked end housing (Fig 6.9)	2
10	3329-240	Sprocket sleeve, leg pivot (Fig 6.10)	2
11	3329-279	Flanged sleeve, leg pivot, LH (Fig 6.10)	1
12	3329-231	Pin, slipper pivot	2
13	3329-230	Slipper, chain tension	1
14	M007-807	Grubscrew, dog point, M6 x 30 mm lg,	1
15	J550-090	Hole plug, 3/8 in. hole	1
16		J202-059 joining link, 1/4 in. pitch (2 off), OR J202-057 cranked link (double), 1/4 in. pitch (1 off) and J202-059joining link, 1/4 in. pitch (1 off)	
17	3329-278	Flanged sleeve, leg pivot, RH (Fig 6.10)	1
18	M005-903	Screw, csk skt hd, M4 x 12 mm lg	8

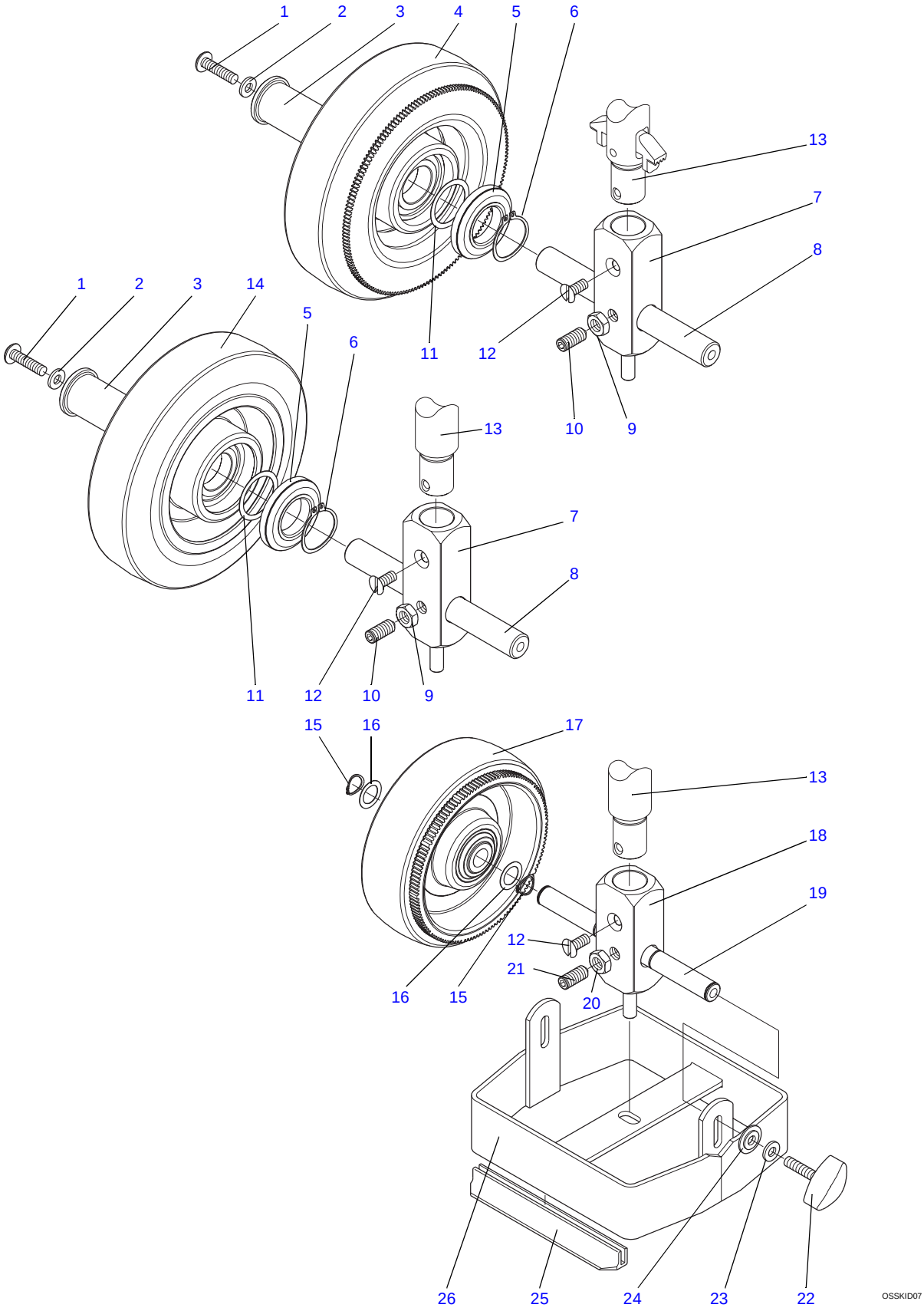

Fig 6.12 Osprey Plus Two-Stage Pedestal - Skid - Wheels

Fig 6.12 Osprey Plus Two-Stage Pedestal - Skid - Wheels

Item	Part No.	Nomenclature	Qty
	3329-19	Wheel unit assy, 160 mm dia braked (OB skid), comprising:	2 per skid
1	M007-524	Screw, skt butt hd, M6 x 25 mm lg	2
2	M601-008	Washer, shakeproof, M6	2
3	3329-266	Sleeve, wheel mounting	2
4	3329-29	Wheel/disc (bonding) assy, including:	2
5	—	Dust cover	2
6	M701-038	Circlip, 25mm dia shaft, external, bowed	4
7	3329-264	Block, wheel pivot	1
8	3329-265	Spindle	1
9	M500-098	Nut, half-hex, M8	2
10	M008-818	Grub screw, skt hd cone point, M8 x 20 mm lg	2
11	3329-306	Shim	A/R
12	M007-150	Screw, csk hd slotted, M6 x 14 mm lg	6 per skid
13	—	Wheel unit shaft (Figs 6.6 and 6.7)	—
	3329-20	Wheel unit assy, 160 mm dia tiller (OB skid), comprising:	1 per skid
1	M007-524	Screw, skt butt hd, M6 x 25 mm lg	2
2	M601-008	Washer, shakeproof, M6	2
3	3329-266	Sleeve, wheel mounting	2
14	3329-267	Wheel (modified), including:	2
5	—	Dust cover	2
6	M701-038	Circlip, 25 mm dia shaft, external, bowed	4
7	3329-264	Block, wheel pivot	1
8	3329-265	Spindle	1
9	M500-098	Nut, half-hex, M8	2
10	M008-818	Grub screw, skt hd cone point, M8 x 20 mm lg	2
11	3329-306	Shim	A/R
12	M007-150	Screw, csk hd slotted, M6 x 14 mm lg	6 per skid
13	—	Wheel unit shaft (Figs 6.6 and 6.7)	—
	3329-40	Wheel unit assy, 125 mm (Studio skid), comprising:	3 per skid
15	M701-037	Circlip, 12 mm dia shaft, external bowed	4
16	M602-003	Shim washer	A/R

Fig 6.12 Osprey Plus Two-Stage Pedestal - Skid - Wheels (Cont)

Item	Part No.	Nomenclature	Qty
17	3329-310	Wheel, complete with brake ring	2
18	3329-312	Block	1
19	3329-311	Spindle	1
20	M500-087	Nut, half-hex, M6	2
21	M007-821	Grub screw, skt hd cone point, M6 x 20 mm lg	2
12	M007-150	Screw, csk hd slotted, M6 x 14 mm lg	6 per skid
13	—	Wheel unit shaft (Figs 6.7 and 6.8)	—
	3329-41	Cable guard assy, comprising:	3 per skid
22	K403-005	Knob	2
23	M600-007	Washer, M6, heavy	
24	3329-307	Spacer	2
25	3329-314	Scoop strip	2
26	3329-42	Cable guard (weld) assy	1

Fig 6.13 Osprey Plus Two-Stage Pedestal - Composite Spare Parts

Part No.	Nomenclature	Qty
3328-901SP	Tank tube - spare, comprising:	
3328-275	Tank tube	1
3328-902SP	Steering column, complete with mounting screws, comprising:	
3328-19	Steering column assembly, comprising:	1
M005-735	Screw, low profile skt cap hd, M4 x 12 mm lg	4
M006-714	Screw, skt cap hd, M5 x 25 mm lg	3
3328-7	Fitting instructions	1
3328-903SP	On-shot clamp assembly, comprising:	
3328-237	Clamp pad shoe	1
3328-238	Clamp guide shaft	1
3328-285	Clamp pad	1
M600-007	Plain washer, M6	1
M601-254	Belleville washer	18
3328-904SP	Steering ring/tank top plate	
3328-906SP	Tapered ram assembly - spares, comprising:	
3328-371	Tapered ram bung	1
3328-372	Tapered ram guide	1
3328-373	Piston	1
3328-374	Cup	1
3328-375	End bung	1
M700-010	Circlip	2
Q001-012	‘O’ ring	1
R900H038	‘O’ ring	3
3328-909SP	Relief valve assembly (for tank assemblies without tracks), comprising:	
3328-920SP	Tank end plug - non-bearing tracks	1
3320-266	Relief valve piston	1
3320-211	Relief valve spring retainer	1

Fig 6.13 Osprey Plus Two-Stage Pedestal - Composite Spare Parts (Cont)

Part No.	Nomenclature	Qty
3329-262	Tapped grub screw	1
3328-346	Inlet valve guide	1
J532-116	Compression spring	1
J550-099	Precision rubber ball	1
M004-706	Screw, skt cap hd, M3 x 16 mm lg	2
M005-513	Screw, skt butt hd, M4 x 6 mm lg	1
M006-504	Screw, skt butt hd, M5 x 6 mm lg	1
Q001-121	'O' ring	1
Q900H013	'O' ring	1
R900H067	'O' ring	1
R900H015	'O' ring	1
M005-104	Screw, Pozi csk hd, M2.5 x 10 mm lg	2
R300-001	Sealing ring	1
R300-002	Sealing ring	1
3328-910SP	Tapered ram relief valve assembly (for tank assemblies without tracks), comprising:	
3328-906SP	Tapered ram assembly - spares	1
3328-909SP	Relief valve assembly (for tank assemblies without tracks)	1
3328-343	Guide bush	1
L700-004	Spirol ring	1
Q900H037	'O' ring	1
M007-913	Screw, skt csk hd, M6 x 12 mm lg	4
3328-369	Filler tube	1
3328-911SP	Schrader valve cap, comprising:	
3328-384	Mod to Schrader valve cap	1
3328-304	Pressure release button	1
3328-912SP	Customer seal kit, comprising:	
Q001-007	'O' ring, 5/32 in. ID 200-007-4470	8
Q001-010	'O' ring, 1/4 in. ID 200-010-4470	3

Fig 6.13 Osprey Plus Two-Stage Pedestal - Composite Spare Parts (Cont)

Part No.	Nomenclature	Qty
Q001-051	‘O’ ring, 1 /58 in.	1
R900H011	’O’ ring, 20 mm ID 206-020-4470	3
R900H012	’O’ ring, 33 mm ID 206-033-4470	6
R900H028	’O’ ring, 15.6 mm ID 202-642	3
R900H068	’O’ ring, 14 mm ID 206-314-4470	1
R900H069	’O’ ring, 75 mm ID 206-375-4470	1
R900H101	’O’ ring, 30 mm ID 204-630-4470	1
3328-913SP	Service seal kit, comprising:	
J550-099	Precision rubber ball	1
Q001-007	‘O’ ring, 5/32 in. ID 200-007-4470	8
Q001-010	‘O’ ring, 1/4 in. ID 200-010-4470	3
Q001-011	‘O’ ring, 3/16 in. ID 200-008-4460	2
Q001-012	‘O’ ring, 5/16 in.	1
Q001-019	‘O’ ring, 9/16 in. ID 200-010-4490	1
Q001-051	‘O’ ring, 1 /58 in.	1
Q001-104	‘O’ ring, 5/16 in. ID 200-804-4470	1
Q001-121	‘O’ ring, 3/32 in. ID 200-103-4470	1
Q900H013	‘O’ ring, 1 1/2 in. ID 200-222-4470	2
Q900H016	‘O’ ring, 1 1/8 in. ID 200-216-4470	1
Q900H037	‘O’ ring, 1 3/16 in. ID 200-321-4460	1
R300-001	Sealing ring	1
R300-002	Sealing ring	1
R300-003	Sealing ring	1
R300-004	Sealing ring	1
R900H011	’O’ ring, 20 mm ID 206-020-4470	3
R900H012	’O’ ring, 33 mm ID 206-033-4470	6
R900H015	’O’ ring, 34 mm ID 204-034-4470	2
R900H016	’O’ ring, 16 mm ID 204-016-4470	1
R900H017	’O’ ring, 22 mm ID 204-022-4470	4
R900H028	’O’ ring, 15.6 mm ID 202-642	3
R900H036	’O’ ring, 11.91 mm ID 200-614-4470	1

Fig 6.13 Osprey Plus Two-Stage Pedestal - Composite Spare Parts (Cont)

Part No.	Nomenclature	Qty
R900H038	'O' ring, 11 mm ID 202-637-4470	3
R900H068	'O' ring, 14 mm ID 206-314-4470	1
R900H069	'O' ring, 75 mm ID 206-375-4470	3
R900H101	'O' ring, 30 mm ID 204-630-4470	1