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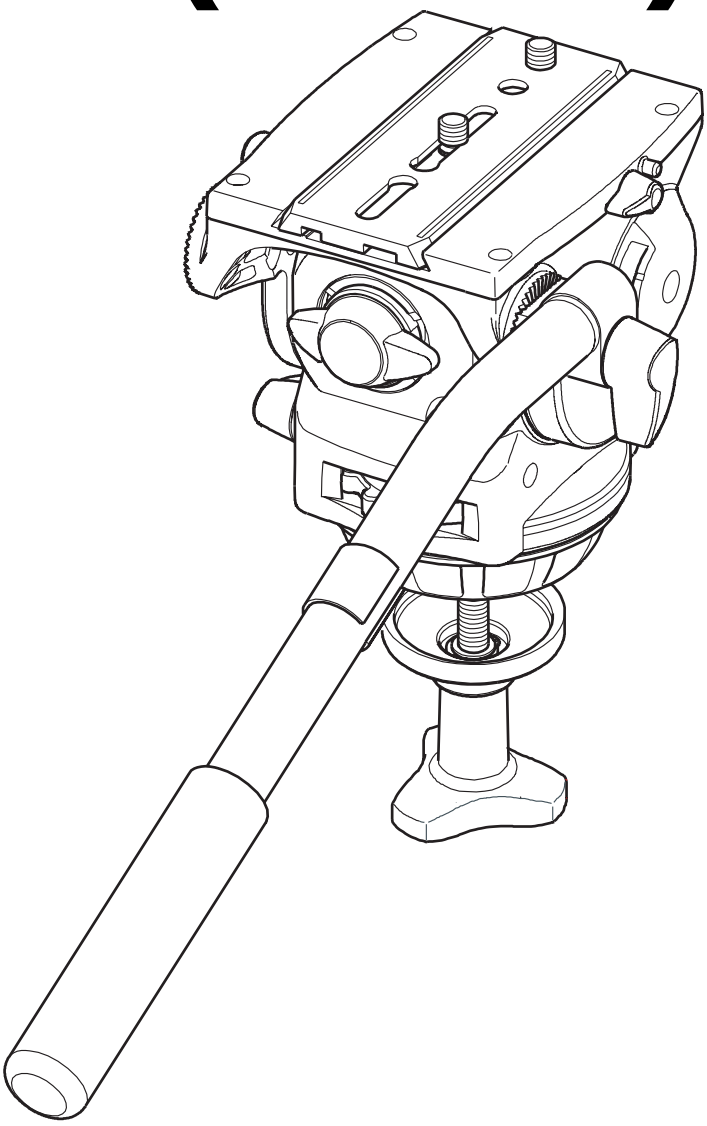
Maintenance Manual

Vision 8 (Black)

Pan and Tilt Head



Vinten

Camera Control Solutions

Vision 8 (Black)

PAN AND TILT HEAD 3841

MAINTENANCE MANUAL AND ILLUSTRATED PARTS LIST

PUBLICATION PART No. 3841-9

ISSUE 1

Foreword

This manual provides full and detailed maintenance and spare parts information for the Vinten® Vision® 8 (Black) pan and tilt head.

WARNING!: Read the Safety Section on page 5 before using this pan and tilt head 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 pan and tilt head. Attention to the details contained herein will ensure that the pan and tilt head 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 ‘Vision 8 (Black) Pan and Tilt Head Maintenance Manual’ (3841-9). 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.

Contents Clicking here will take you to the Contents Page.

Clicking here will take you to the first page.

Clicking here will take you to the previous page.

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Click here to go back to the previous view.

Alternatively, you may use the Acrobat Reader navigation buttons.

Safety - Read This First!

Warning symbols in this maintenance manual

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

Critical data

Mass

Mass (complete with pan bar and bowl clamp)	3.0 kg (6.6 lb)

Load

Typical payload	10.5 kg (23 lb)

Contents

Associated Publication

Vision 8 (Black) Pan and Tilt Head - Operators Guide

Publication Part No 3841-8

Illustrations

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

Weight	
Head	2.7 kg (5.9 lb)
Pan bar	0.2 kg (0.4 lb)
Bowl clamp)	0.14 kg (0.3 lb)
Height to mounting face	15 cm (5.9 in.)
Length	14 cm (5.5 in.)
Width	12.5 cm (4.9 in.)
Load capacity	See balance graph
Tilt range	±90°
Pan range	360°
Pedestal/tripod fixing	100 mm ball

Design Improvements

DETAILS	SERIAL No. INFORMATION

Section 1

Introduction and Description

Contents **Para**

Introduction

1 The Vision 8 (Black) pan and tilt head is part of a range designed for broadcast professional, corporate and educational use. It is constructed largely in aluminium and magnesium alloys to produce a robust, lightweight unit. The unique counterbalance system enables a wide variety of camera/lens combinations to be maintained in perfect balance over the range of tilt movements. A maximum tilt angle of 90° is available at intermediate loadings, whilst at higher loadings the range of tilt motion is progressively reduced to 40°. A graph is provided in Section 2 which illustrates the relationship between load and centre-of-gravity (C of G) and may be used to ascertain the suitability of the head for any given combination of camera, lens and accessories.

2 Drag is provided by the Vinten lubricated friction (LF) system which allows wide variation of the drag setting on both pan and tilt axes to suit operator preference, and permits “whip” movements to be executed, irrespective of drag setting. Pan and tilt axes are each provided with a brake.

Description

3 The Vision 8 pan and tilt head embodies a spring counterbalance mechanism, LF drag assemblies, brakes on the pan and tilt mechanisms and a camera mounting plate.

4 The balance system is easily adjusted by a knob (2) on the rear of the head. Maximum and minimum payloads that can be balanced, and tilt ranges, are dependent on the weight of the camera and accessories and on the centre-of-gravity (C of G) height. The control compensates for differing platform loads by varying the compressive force on the counterbalance spring.

5 Both the pan and tilt mechanisms incorporate the Vinten lubricated friction (LF) system to ensure smooth movement of the camera about these axes and are fitted with control knobs (4)(7) to adjust the drag setting. The whip-pan facility is unaffected by the pan drag setting. Both drag knobs are provided with scales graduated from 0 to 9.

6 Friction brakes on each axis allow the head to be locked at any chosen position. The operating knobs for both brakes (13)(15) are fitted at the left-hand side of the head.

7 Pan bar mounting points (3) are located at the rear of the head, on either side of the camera mounting platform. A fixed pan bar (1) is supplied and is attached using a pan bar clamp, with angular adjustment available on the mount serrations. A second pan bar may be fitted.

8 The camera is attached to the head by means of a slide plate (11) or by using the optional Quickfit adaptor. A clamp (6) is provided to hold the slide plate in position and a lock (14) prevents its inadvertent removal from the head.

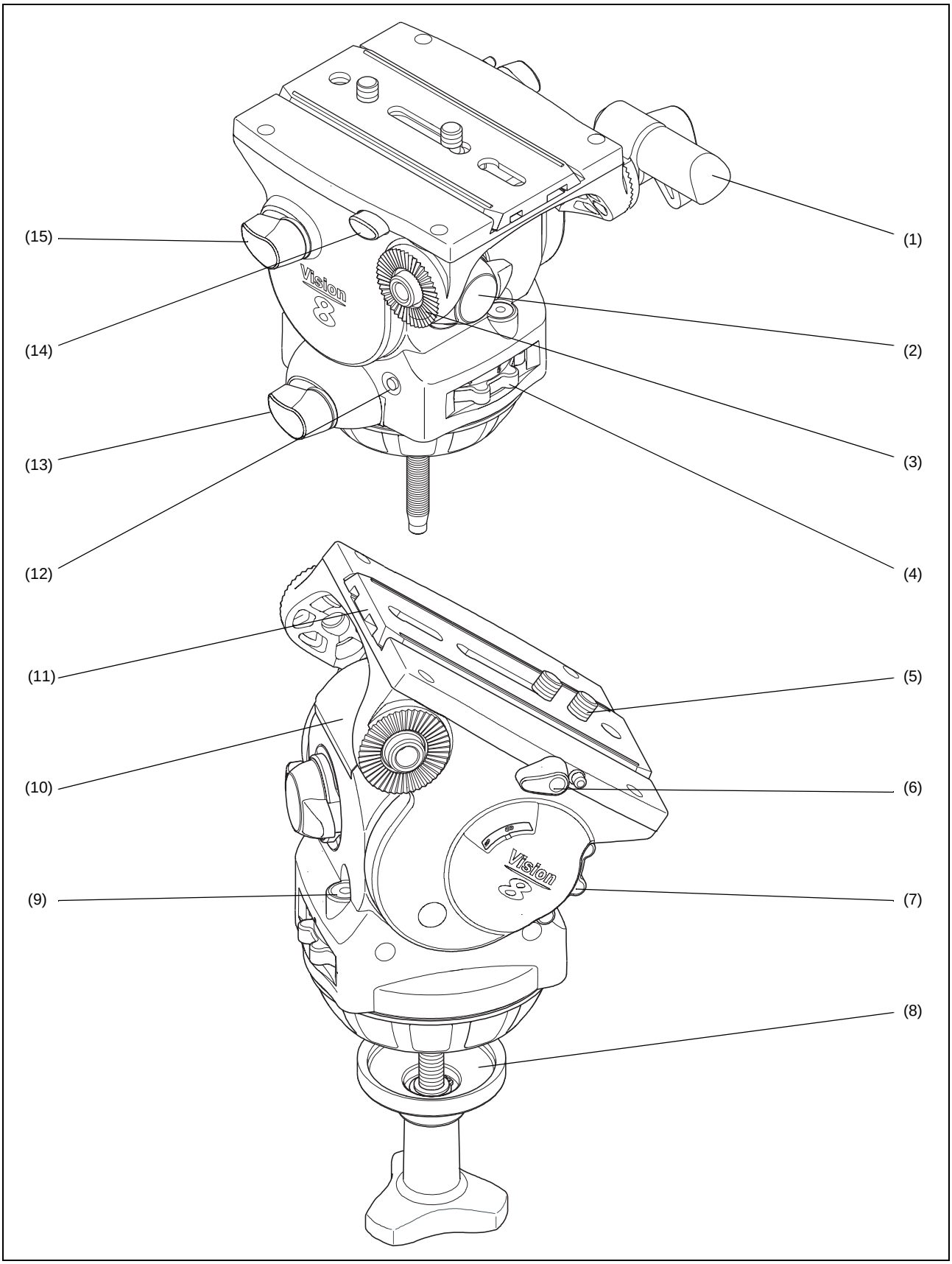


Fig 1.1 Vision 8 Pan and Tilt Head

9 A ball base and clamp (8) for mounting on a 100 mm bowl is provided. An illuminated level bubble (9) is fitted at the rear of the head, lit by pressing the switch (12). The battery for the light is housed in a compartment in the top of the mechanism housing, closed by a cap (10). Adaptors are available which permit installation on other mounts.

Section 2

Operation

Contents **Para**

General

1 To identify components, please refer to Fig 1.1. For further operating instructions, please refer to Vision 8 (Black) Operators Guide, Publication Part No. 3841-8.

Installing the head on a tripod

2 The Vision 8 head is supplied with an integral 100 mm ball mount and is designed for installation on a compatible Vinten Vision tripod.

3 Adaptors are available which enable the heads to be installed on tripods or pedestals fitted with other mountings.

4 To install the head, remove the bowl clamp assembly (8) from the head, position the head on the tripod and refit the bowl clamp assembly from below. Level the head with the aid of the level bubble (9) and tighten the bowl clamp. The level bubble may be illuminated by pressing the switch (12). The light will extinguish after 15 seconds.

Mounting the camera

5 Remove the slide plate (11) from the head by releasing the slide clamp (6), pressing the slide lock release (14) and pulling the plate to the rear.

6 Attach the slide plate to the camera or camera mounting plate under the approximate centre of the camera's weight using both fixing screws (5). Position the screws as far apart as possible.

7 Set the platform level and apply both the pan and tilt brakes (13)(15).

8 Push the slide plate and camera into the track in the platform, ensuring slide release (14) snaps into position.

Mounting the camera (optional Quickfit adaptor)

9 To mount the camera using the optional Quickfit adaptor, proceed as follows (Fig 2.1):

9.1 If not already attached, secure the Quickfit adaptor (17) to the slide plate (11) with the two screws provided (5).

9.2 Free the Quickfit wedge (16) from the adaptor by simultaneously pushing in on the safety catch (19) and operating the wedge release (18).

9.3 Fit the Quickfit wedge to the camera with the two screws (20) provided.

9.4 Insert the forward end of the wedge into the forward end of the adaptor, pushing against the spring tension of the lock. Lower the rear of the wedge into the adaptor until an audible click indicates that the wedge is engaged with the adaptor.

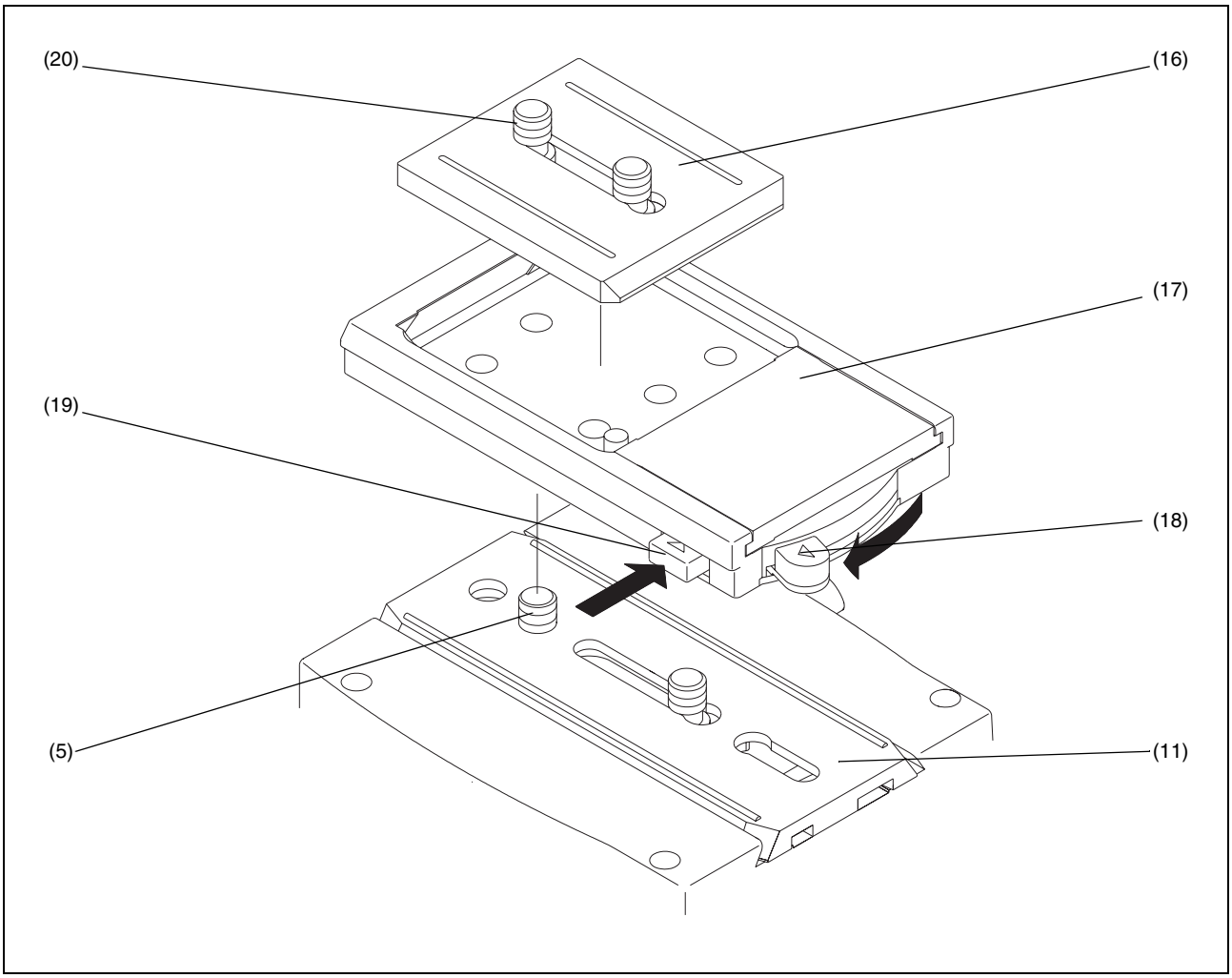


Fig 2.1 Optional Quickfit Adapter

Balancing the head

10 Balancing the Vision 8 head achieves two objectives. Firstly, when a head is correctly balanced the operator will need a minimum amount of even effort to move the head. Secondly, once balanced, the head and its payload can be set to any tilt position and the head will maintain this position with “hands off”.

11 The graph (Fig 2.2) illustrates the relationship between load and centre-of-gravity (C of G) height and may be used to ascertain the suitability of the head for any given combination of camera, lens and accessories. The shaded area of the graph corresponds to those loads/C of G heights that can be balanced over the full tilt range. The areas to the right indicate the progressively reducing tilt range over which the head can balance higher loads.

12 Prior to balancing the head ensure that the pan bars and any ancillary equipment have been fitted in order to prevent upsetting the balance once it has been achieved.

12.1 Release the tilt brake (15). Turn the balance knob (2) counter-clockwise until the head falls away from horizontal under the weight of the camera.

12.2 Release the slide clamp (6) and slide the camera backwards or forward until it balances horizontally. Apply the slide clamp (6).

12.3 Turn the balance knob (2) clockwise until the camera does not fall away when the head is tilted and released.

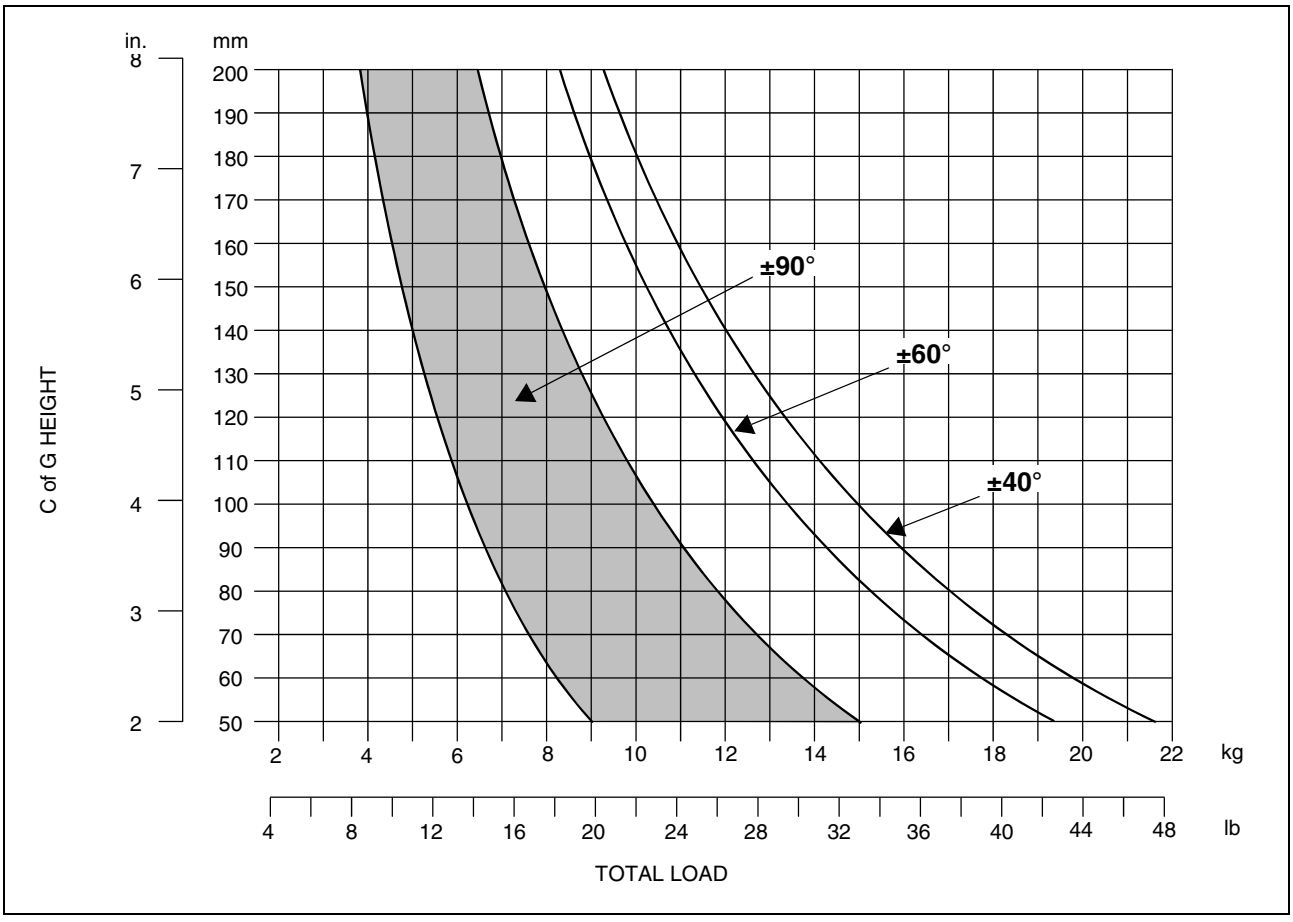


Fig 2.2 Balance Graph

12.4 Repeat steps 12.2 and 12.3 until perfect balance is achieved, when the camera will remain set at any angle from +90° to –90° without falling away or springing back. Re-apply the tilt brake (13).

NOTE: Maximum tilt angle is less than 90° for heavy payloads with high C of G - see balance graph.

Pan and tilt brakes

13 Friction brakes on each axis allow the head to be locked at any chosen position. The operating knobs for the pan brake (13) and tilt brake (15) are fitted at the left-hand side of the head.

14 To apply the brake, turn the knob fully clockwise. To release the brake, turn the knob fully counter-clockwise.

Pan and tilt drag

15 Both the pan and tilt mechanisms incorporate the Vinten liquid friction (LF) system to ensure smooth movement of the camera about these axes. and are fitted with control knobs to adjust the drag setting.

16 Both drag knobs are provided with scales, graduated from 0 to 9.

17 The tilt drag adjustment knob (7) is on the right-hand side of the head, the pan drag knob (4) is on the rear of the head. The whip-pan facility is unaffected by the pan drag setting.

18 To increase drag, turn the knob clockwise, towards a higher graduation. To decrease drag, turn the knob anti-clockwise, towards a lower graduation.

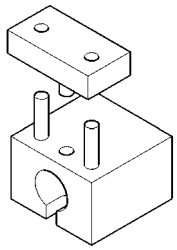
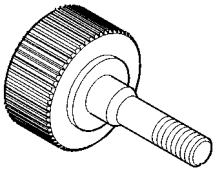
Section 3

Tools and Materials

General

1 The following special tools and consumable materials will be required for servicing, disassembly, repair, assembly and adjustment.

Special tools

	ITEM	PART No.	PROCEDURE
	Pin press	3431-912TL	Installing dowel pin to connect actuator shaft and adjustment slide
	Special thumb screw	3441-910TL	Assembling pan and tilt drag units

NOTE: Adhesives and lubricants are not supplied by Vinten Broadcast Ltd and should be obtained under local arrangements

Consumable materials

ITEM	PART No.	USE
Grease, Easyrun 50	Z150-081	Lubrication
Grease, Castrol LM	Z150-123	Lubrication
Loctite 222E	Z002-075	Screw locking
Loctite 495	Z002-059	Spring cap buffer
Silcoset 153	Z002-036	Pin retainer
Adhesive, silicone RTV, Silastic 738	Z100-034	PCB housing sealant
Hot melt glue stick	Z002-104	Securing wiring
Vinten fluid No. 3	3051-30	Drag fluid

Section 4

Servicing

Contents **Para**

General

1 The Vision 8 pan and tilt head is robustly made to high engineering standards and little attention is required to maintain serviceability save regular cleaning. Attention to the following points will ensure a long and useful life with minimum need for repair.

Cleaning

2 During indoor use, the only cleaning required should be a regular wipe over with a lint-free cloth. Dirt accumulated during storage may be removed using a semi-stiff brush. Particular attention should be paid to the levelling bowl and mounting face of the head and to the space between the tilting assembly and the base.

3 All Vision heads are weatherproof. However, use out-of-doors under adverse conditions will require special attention. Salt spray should be washed off with fresh water at the earliest opportunity. Sand and dirt acts as an abrasive and should be removed using a semi-stiff brush or 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 Replace the level bubble battery yearly.

5 During use, check the following:

5.1 Check the effectiveness of the pan and tilt brakes. Adjust as necessary.

5.2 Check the operation of the illumination of the level bubble. Replace battery as necessary.

6 No further routine maintenance is required.

Battery replacement

7 he battery illuminates the level bubble. After pressing the switch it remains lit for approximately 15 seconds.

8 The battery should be replaced yearly or whenever the illumination is considered inadequate.

WARNING!: If a payload is not fitted to the head, turn the balance knob (2) full counter-clockwise to reduce the balancing force before tilting the head forwards.

9 To replace the battery (Fig 4.1):

9.1 Tilt the head forwards to allow access to the battery cover (10) and apply the tilt brake (15).

9.2 Using a thin-bladed screwdriver or similar tool, prise off the battery cover (10).

9.3 Pull out the battery (10.1) to the extent allowed by the cable and remove the connector (10.2).

9.4 Push the connector onto the terminals of the replacement battery.

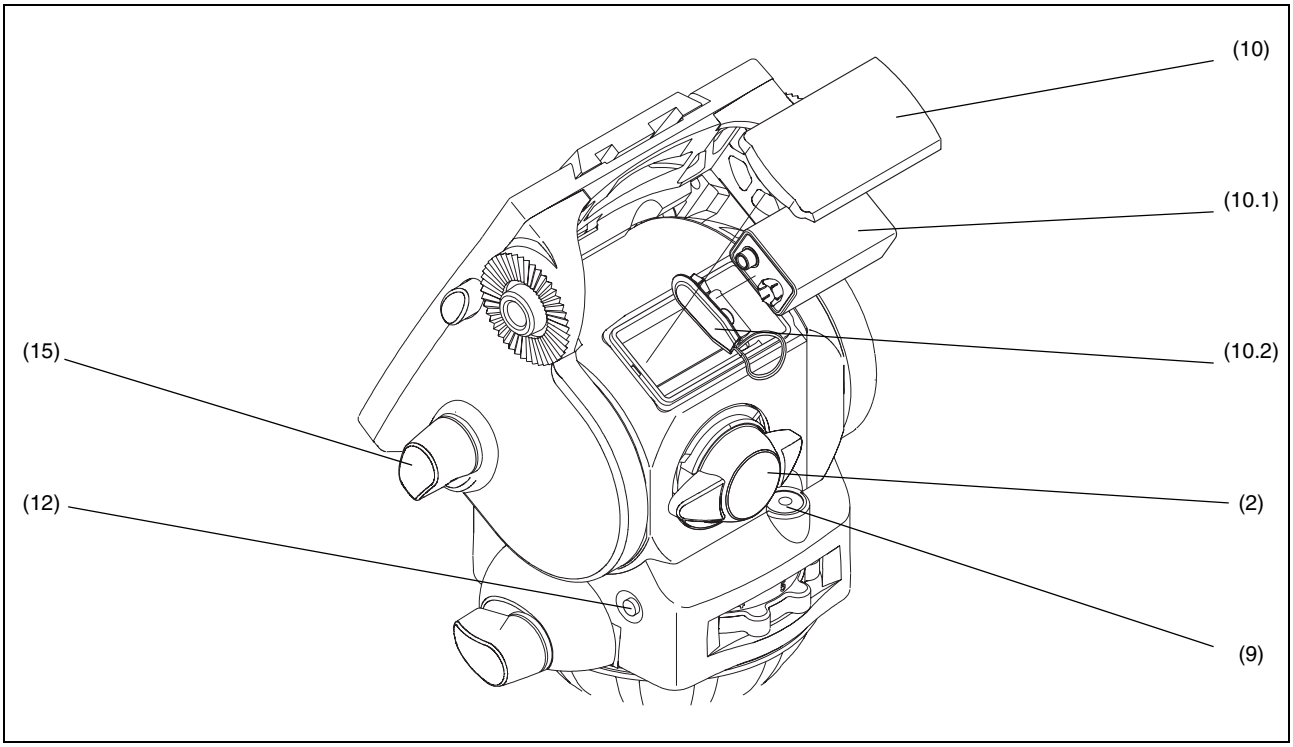


Fig 4.1 Battery replacement

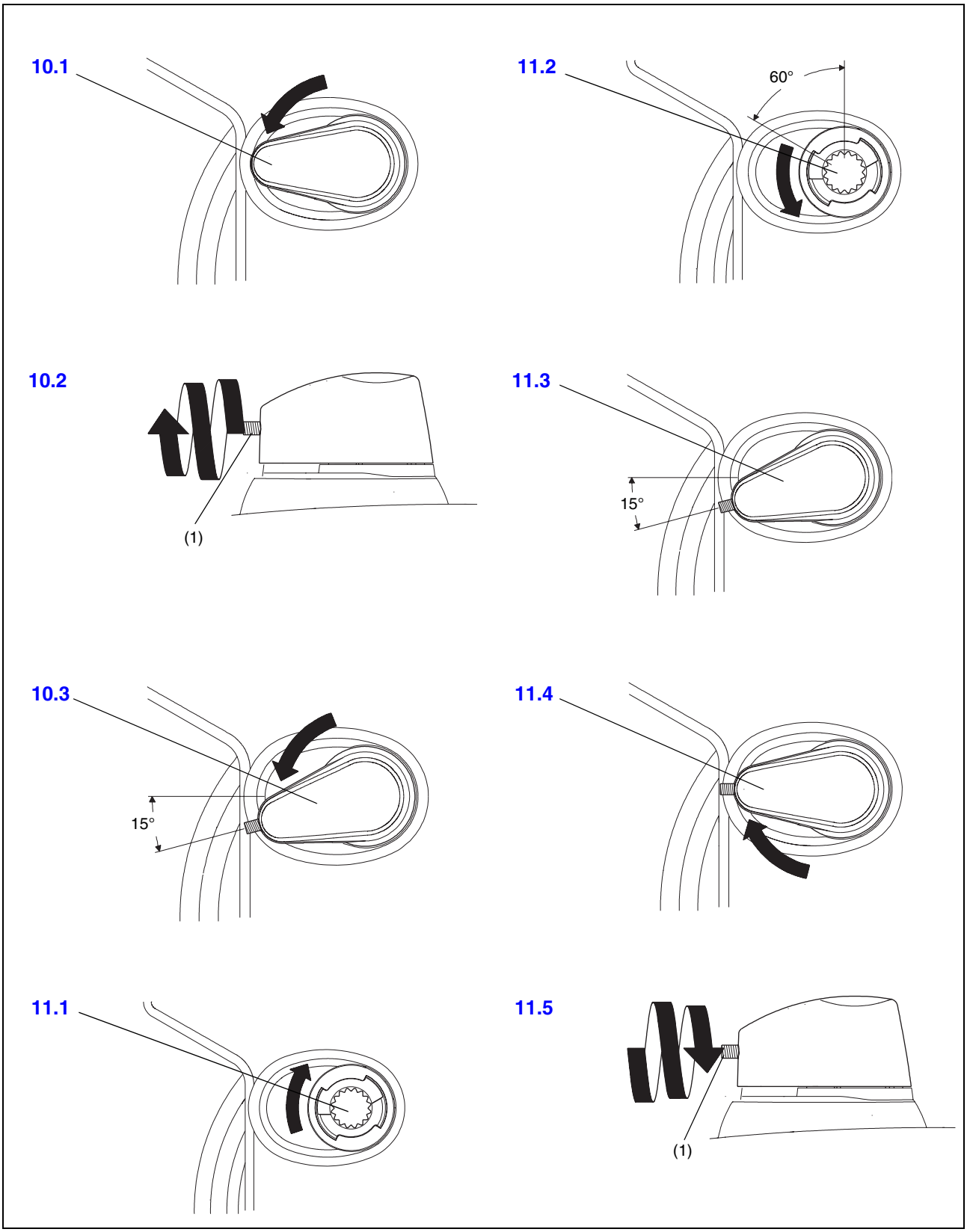


Fig 4.2 Brake knob adjustment

9.5 Position the battery in the battery compartment, ensuring that the wiring is neatly stowed in the cut-out provided.

9.6 Refit the battery cover (10).

9.7 Press the switch (12) and ensure that the level bubble (9) is lit for approximately 15 seconds.

Adjustments

Brake knob adjustment

NOTE: The pan and tilt brake knobs are set during manufacture so that the brakes are fully applied before the knobs reach their upper stops. As the brakes bed in during use it may be necessary to reset the knobs.
The procedure shown is for the tilt brake knob.The pan brake is adjusted in a similar fashion

10 To remove the knob (Fig 4.2):

10.1 Turn the knob counter-clockwise to its lower stop.

10.2 Unscrew the securing screw (1) until its stop is reached

10.3 Turn the knob until it is 15° below the horizontal, then pull the knob off the shaft.

11 To install the knob (Fig 4.2):

11.1 Turn the shaft clockwise, by hand, until the brake is applied.

11.2 Turn the shaft 60° counter-clockwise.

11.3 Push the knob onto the shaft at the 15° position.

11.4 Turn the knob clockwise to the horizontal position and push it inwards..

11.5 Screw in the securing screw (1). Do not overtighten.

12 Turn the knob clockwise and ensure that the brake is fully applied before the upper stop is reached.

13 Turn the knob counter-clockwise and ensure the brake is released before the lower stop is reached.

14 Re-adjust the position of the knob if necessary.

Drag control knob adjustment

NOTE: The pan and tilt drag control knobs will not normally require adjustment. However, in the event that bedding-in of the mechanism occurs, the knobs should be reset. The procedure shown is for the pan drag knob. The tilt drag knob is adjusted in a similar fashion

15 The pan and tilt drag control knobs are set so that drag begins to be felt between 1 and 2 on the scale. The procedure for resetting is as follows (Fig 4.3):

15.1 Release the pan and tilt brakes.

15.2 Turn the drag control knob (2) until the grub screw (3) is accessible. Slacken the grub screw by six turns.

15.3 Hold the indicator (1) stationary and rotate the control knob (2) 18° to the left. 18° is two clicks of the detent mechanism, or half the pitch of the control knob lobes.

15.4 Carefully tighten the grub screw (3), adjusting the position of the control knob as necessary so that the grub screw seats correctly in a slot in the indicator and may be screwed fully home.

15.5 Decrease drag to zero.

15.6 Increase drag and ensure that drag begins to be felt at about 1 on the indicator. Repeat the above procedure until this can be achieved.

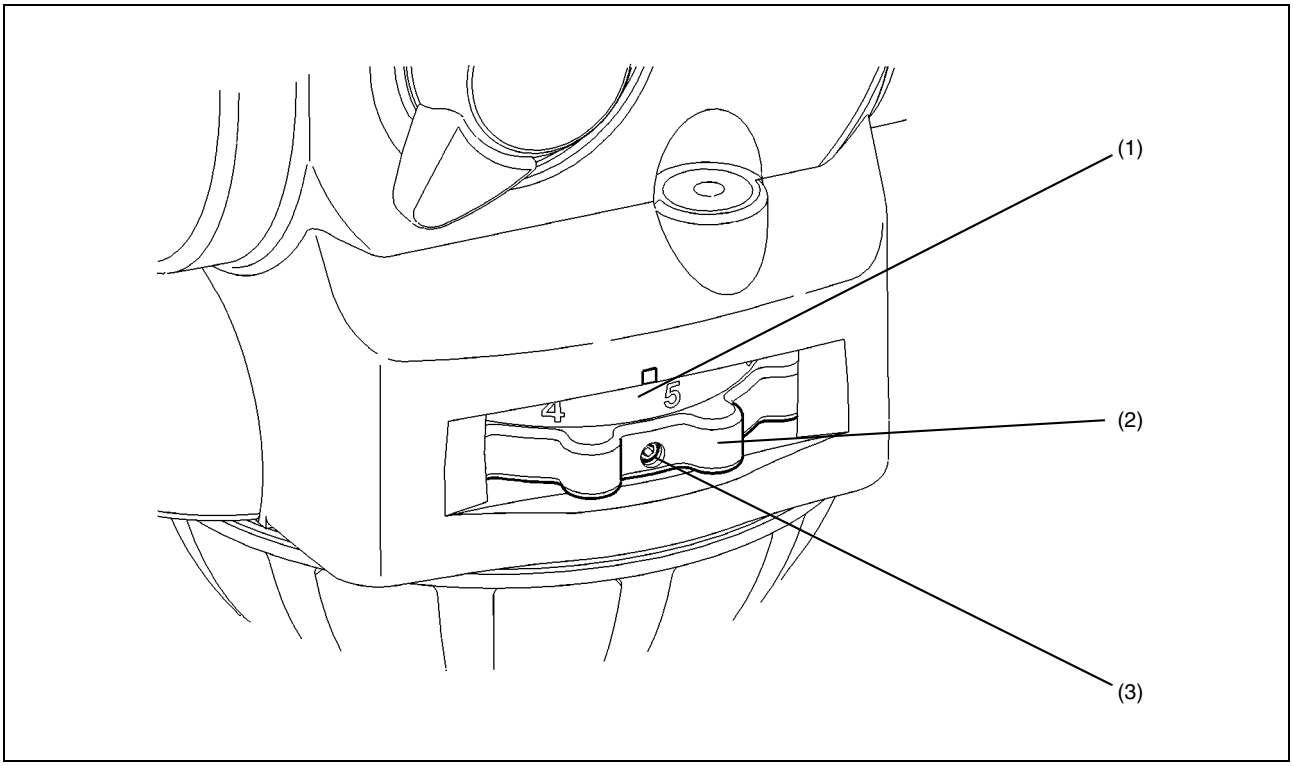


Fig 4.3 Drag control knob adjustment

Section 5

Repair

Contents Para

General

1 This section details procedures for disassembly and assembly of the Vision 8 pan and tilt head. Reference is made in the procedures to figures in Section 6 - Illustrated Parts List.

2 The head is constructed from precision components, many of which are of aluminium or magnesium alloy. Several of the assembly procedures require the use of specific sealants, adhesives or lubricants. It is advised that only experienced and properly equipped personnel with access to all necessary materials and tools should attempt to overhaul, repair or replace components on these heads. The special tools and consumable materials required for work on Vision 8 heads are listed in Section 3 - Tools and Materials.

WARNING!: To prevent damage to socket screw heads, use the correct hexagonal wrenches and ensure that they are in good condition.
The use of ball-ended hexagonal wrenches will facilitate dismantling and assembly.

Disassembly

Platform

3 To remove the platform (Fig 6.2):

NOTE: Do not remove the slide assembly (44) prior to removing the platform. This will retain the clamping and release components during removal.

3.1 Remove four screws (7) securing platform (1) to tilt drag unit (13) and tilt brake unit (25). Remove platform from head.

4 To dismantle the platform (Fig 6.2):

4.1 Slacken the clamp knob (5) and push in the slide release (10). Pull the platform slide (44) to the rear.

4.2 Remove the slide release (10) and spring (9) from the underside of the platform.

4.3 Pull the slide clamp block (8) off the spigot on the underside of the platform. Remove the screw (4) and pull the platform clamp knob (5) off the slide clamp shaft (6). Screw the shaft out of the platform.

4.4 If required, remove the dowel pin (2) from the platform.

Tilt drag unit

WARNING!: Before attempting to remove the tilt drag unit, the balance mechanism spring tension must be relieved. Failure to relieve the balance mechanism spring tension may result in serious damage to the head.

5 To remove the tilt drag unit (Fig 6.2):

5.1 Turn the balance knob (19) fully counter-clockwise.

5.2 Remove the mechanism housing label (40).

5.3 Insert a 5 mm hexagonal wrench though the hole under the mechanism housing label and slacken the screw (38) to relieve the balance mechanism spring tension.

5.4 Remove three screws (11) securing the tilt drag unit (13) to the mechanism housing (43).

5.5 Carefully pull the tilt drag unit assembly (13) off the mechanism housing assembly (43). Slight tapping of the RH side plate may be necessary to free the assembly.

6 To dismantle the tilt drag unit assembly:

6.1 Referring to Fig 6.2, remove the blanking cap (12) from the tilt drag assembly

6.2 Referring to Fig 6.4, remove three screws (2) securing RH side plate (1) to the tilt drag housing (22). Separate RH side plate and tilt drag housing.

6.3 Slacken the grub screw (4) and pull the tilt drag indicator assembly (3) off the tilt drag knob assembly (5).

6.4 Unscrew the tilt drag knob assembly (5) and remove the steel ball (6), the spring (7), two thrust washers (23) and the needle thrust bearing (24). Pull the 'O' ring (25) off the shaft of the tilt drag knob assembly. Discard the 'O' ring (25).

6.5 Remove two plugs (8) from the face of the tilt drag housing (22).

NOTE: The tilt drag unit assembly contains 12 cc of Vinten Fluid No. 3. Be prepared to catch any fluid that may leak from the assembly.

6.6 Pull apart the tilt drag housing (22) and the mechanism side cover (19).

6.7 Remove the drag actuator block (14) and two drag wedges (20) from inside the tilt drag housing.

6.8 Remove screw (13) and pull the drag shoe assembly (12) out of the tilt drag housing.

6.9 Pull out the tilt seal ring (10) and remove and discard the omniseal (9) and the 'O' ring (10).

6.10 Wipe all traces of Vinten Fluid No. 3 from components.

6.11 Carefully remove the snap ring (18) from the mechanism side cover (19). Pull out the bearing (17), remove the seal shim (16) and remove and discard the omniseal (15).

Tilt brake unit assembly

7 To remove the tilt brake unit assembly (Fig 6.5)

7.1 Remove two screws (1) securing tilt brake unit assembly to the mechanism housing (2).

7.2 Carefully pull the tilt brake unit assembly off the mechanism housing. Slight tapping of the LH side plate may be necessary to free the assembly.

8 To dismantle the tilt brake unit assembly (Fig 6.5):

8.1 Remove the tilt brake knob (7) (See "Brake knob adjustment" on page 22).

8.2 Turn the tilt brake disc (3) until the brake disc is free of the calliper (10).

8.3 Pull the tilt brake disc (3) off the LH side plate (6). If required, remove the bearing (4) from the tilt brake disc.

8.4 Unscrew and remove the brake shaft (8).

8.5 Pull the calliper (10) out of its housing, taking care to retain the one outer and two inner brake pads (9, 11).

Balance mechanism

9 To remove the balance mechanism (Fig 6.2):

9.1 Remove the tilt drag unit assembly (Para 5) and the tilt brake unit assembly (Para 7).

9.2 Pull the adjustment slide pin (29) out of the mechanism housing (43).

9.3 Remove screw (38) from actuator shaft (33).

9.4 Remove spiral ring (18) from the groove in mechanism housing (43) and allow it to rest on the neck of balance knob assembly (19).

9.5 If the dowel pin (31) has been properly centralised, it will be possible to pull the balance knob (19), adjustment slide (30) and actuator shaft (33) out of the mechanism housing. The balance knob may then be unscrewed from the adjustment slide and two thrust washers (16) and the thrust bearing (17) removed.

9.6 If the assembled balance mechanism cannot be pulled out of the mechanism, unscrew the balance knob assembly (19) and remove from the mechanism housing, together with two thrust washers (16) and the thrust bearing (17). Manoeuvre the assembled adjustment slide (30) and actuator shaft (33) out of the mechanism housing.

9.7 Lift the spring actuator assembly (34), spring (35), buffer (36), spring end cap (37) and screw (38) out of the mechanism housing. The buffer (36) is retained in the end cap (37) with Loctite 495.

9.8 If required, drive out pin (31) to separate adjustment slide and actuator shaft. Remove glacier bearing (32)

Pan unit assembly

10 To remove the pan unit assembly (Fig 6.2):

10.1 Remove the tilt drag unit assembly (Para 5) and the tilt brake unit assembly (Para 7) and the balance mechanism (Para 9).

10.2 Remove the pan brake knob (26) (See “Brake knob adjustment” on page 22).

10.3 Remove one screw (41), one screw (42) and one screw (24) securing pan drag unit (23) to mechanism housing (43). Note length and position of screws.

10.4 Carefully lift the pan drag unit off the mechanism housing and brake shaft.

11 To dismantle the pan drag unit assembly:

11.1 Referring to Fig 6.2, unscrew and remove the brake shaft (27).

11.2 lift the calliper (20) out off the pan drag unit, taking care to retain the two inner and one outer brake pads (21, 22).

11.3 Referring to Fig 6.3, slacken the grub screw (3) and pull the pan drag indicator assembly (1) off the pan drag knob assembly (2).

11.4 Unscrew the pan drag knob assembly (2) and remove the steel ball (4), the spring (5), two thrust washers (6) and the needle thrust bearing (7). Pull the ‘O’ ring (24) off the shaft of the tilt drag knob assembly. Discard the ‘O’ ring (24).

11.5 Remove two plugs (21) from the face of the pan drag housing (8).

11.6 Remove the screw (23) and clamp washer (22) from the end of the pan shaft.

NOTE: The pan drag unit assembly contains 16 cc of Vinten Fluid No. 3. Be prepared to catch any fluid that may leak from the assembly.

11.7 Tap the exposed end of the pan shaft to separate the spherical base (13) from the pan drag mechanism.

11.8 Remove the drag actuator block (12) and two drag wedges (11) from inside the spherical base (13).Remove screw (15) securing the drag shoe assembly (16) to the pan drag housing (8).

11.9 Lift off the pan seal plate (18) and remove and discard the 'O' ring (17) and the omniseal (19).

11.10 Remove two thrust washers (9) and needle thrust bearing (18).

11.11 Wipe all traces of Vinten Fluid No. 3 from components.

11.12 Remove and discard 'O' ring (14) from the shaft in the spherical base (13). If required, remove bearing (20) from the pan drag housing (8).

Electrical system

12 To remove the components of the electrical system (Fig 6.6):

NOTE: The electrical wiring is secured with hot melt glue. Note the position for reassembly.

12.1 Remove the battery (1).

12.2 Remove three screws (3) securing the PCB mounting (4) to the mechanism housing (2).

12.3 Pull the push-button cap (8) off the switch in the PCB mounting (4).

12.4 The wiring is secured to the mechanism housing (2) using glue. Free the wiring and pull the LED out of its housing.

12.5 Free the battery connector from the battery housing (9). The PCB and wiring may now be removed.

12.6 If required, remove the PCB from its housing by separating the upper and lower PCB housings (5, 6).

12.7 Release the battery housing (9) from the mechanism housing (2) by pushing in the clip.

Assembly

Electrical system

13 To install the electrical system (Fig 6.6):

13.1 Push the battery housing (9) into the mechanism housing (2)

13.2 If removed, position the PCB in the upper and lower PCB housings (5, 6) and seal the wire exit holes with Silastic RTV adhesive.

13.3 Push the push-button cap (8) onto the switch in the PCB mounting (4).

13.4 Position the LED in its housing.

13.5 Insert the battery connector into the battery housing (9).

13.6 Position the PCB and wiring in the mechanism housing (2).

13.7 Position wires and secure with hot melt glue.

13.8 Secure the PCB mounting (4) to the mechanism housing (2) with three screws (3).

Pan unit assembly

14 To assemble the pan unit assembly (Fig 6.3):

14.1 If removed, press the bearing (20) into the pan drag housing (8).

14.2 Lightly lubricate the 'O' ring (14) with LM grease and install on the shaft in the spherical base (13).

14.3 Lightly lubricate the thrust bearing (10) with LM grease. With the pan drag housing upside-down, install a thrust washer (9), the thrust bearing (10) and a second thrust washer (9).

14.4 Lightly lubricate the omniseal (19) with LM grease and install in the seal plate (18), ensuring omniseal is correctly oriented.

14.5 Lightly lubricate the 'O' ring (17) with LM grease and install on the seal plate (18).

14.6 Push the assembled seal plate into position on the pan drag housing (8).

14.7 Install the drag shoe assembly (16) on the pan drag housing (8) and secure lightly with screw (15), using Loctite 222E.

14.8 Position two drag wedges (11) and the drag actuator block (12) in the drag shoe assembly (16).

14.9 Screw the special thumb screw (3441-910TL) through the pan drag housing and into the drag actuator block (12). Tighten the thumb screw until the drag shoe (16) begins to expand, then tighten screw (15) fully, but do not overtighten. Unscrew the thumb screw slightly.

14.10 Thoroughly clean and degrease the brake drum on the spherical base (13).

14.11 Install the assembled pan drag mechanism in the spherical base and secure with the clamp washer (22) and the screw (23), using Loctite 222E. Tighten screw (23) down hard, loosen and then retighten to 0.564 Nm (5 lbf/in.).

14.12 Remove the special thumb screw.

14.13 Lightly lubricate the thrust bearing (7) with LM grease. Install a thrust washer (6), the thrust bearing (7) and a second thrust washer (6) on the shaft of the pan drag knob (2).

14.14 Lightly lubricate the 'O' ring (24) with LM grease and install on the shaft of the pan drag knob (2).

14.15 Fill the spring hole in the pan drag housing (8) with LM grease and install the spring (5) and the ball (4).

14.16 Install the assembled pan drag knob in the pan drag housing (8) and screw into the drag actuator block (12).

14.17 Using a syringe through the plug holes (21), fill the bowl with 16 cc of Vinten Fluid No. 3.

14.18 Install two plugs (21). Wipe off any excess fluid.

14.19 Install the pan drag indicator (1) on the pan drag knob (2) and secure with grubscrew (3).

15 To install the pan unit assembly (Fig 6.2):

15.1 Thoroughly clean and degrease two inner brake pads (21) and the outer brake pad (22). Install the brake pads in the pan brake calliper (20) and position on the pan drag unit assembly (23). Screw the brake shaft (27) into the calliper to lightly grip the brake drum.

15.2 Carefully install the pan unit assembly in the mechanism housing (43). Secure with one screw (39), one screw (42) and one screw (24), in positions noted during disassembly.

Balance mechanism

16 To install the balance mechanism (Fig 6.2):

16.1 If removed, secure buffer (36) to spring end cap (37) using Loctite 495. Ensure components are concentric.

16.2 If removed, press glacier bearing (32) into spring actuator shaft (33). Assemble spring actuator shaft in adjustment slide (30) and secure with dowel pin (31), using tool 3431-912TL to install and centralize pin.

16.3 Lubricate balance mechanism components as follows:

16.3.1 Thrust bearing (16) and spring actuator shaft (33) - Castrol LM grease.

16.3.2 Thread of balance knob (19) - Easyrun 50 grease.

16.4 Degrease the threaded bore of actuator shaft (33) and thread of screw (38).

16.5 Install spiral ring (18) on balance knob (19) and screw into adjustment slide (30).

16.6 Position spring (35), assembled buffer/spring end cap (36/37) on spring actuator (34).

16.7 Position assembled spring actuator in the mechanism housing (43).

16.8 Install a thrust washer (16), the thrust bearing (17) and a second thrust washer (16) in the mechanism housing (43).

16.9 Slide assembled balance knob/adjustment slide/actuator shaft into the mechanism housing/ spring actuator, ensuring slot in adjustment slide is to the left.

16.10 Install the adjustment slide pin (29) in the mechanism housing (43), ensuring pin engages in slot in adjustment slide. Secure pin with Silcoset.

16.11 Turn balance knob (19) fully counter-clockwise.

NOTE: Screw (38) is installed and the balance spring pre-loaded after the tilt brake and tilt drag assemblies are installed.

Tilt brake unit assembly

17 To assemble the tilt brake unit assembly (Fig 6.5):

17.1 If removed, press the bearing (4) into the tilt brake disc (3).

17.2 Thoroughly clean and degrease two inner brake pads (11) and the outer brake pad (9). Install the brake pads in the pan brake calliper (10), ensuring that the rounded edge of the outer brake pad (9) faces outwards. Install a suitable piece of scrap material between the inner and outer brake pads to retain them in position.

17.3 Install the assembled calliper in the LH side plate (6).

17.4 Turn the tilt brake disc (3) so that the cut-out in the disc is aligned with the calliper, then push onto the LH side plate (6).

17.5 Turn the tilt brake disc (3) so that the disc passes between the brake pads, driving out the scrap material installed earlier. Set the disc so that the mounting holes are vertical. Lightly screw in the brake shaft (8) to secure the disc.

18 To install the tilt brake unit assembly (Fig 6.5):

18.1 Position the assembled LH side plate in the mechanism housing (2), ensuring that the pin on the spring actuator seats correctly in the needle roller (5). Secure with two screws (1).

Tilt drag unit

19 To assemble the tilt drag unit (Fig 6.4):

19.1 Lightly lubricate the omniseal (15) with LM grease and install in the mechanism side cover (19), ensuring omniseal is correctly oriented.

19.2 Install the seal shim (16) in the mechanism side cover (19).

19.3 Push the bearing (17) into the mechanism side cover (19) and secure with snap ring (18).

19.4 Lightly lubricate the omniseal (9) with LM grease and install in the seal ring (10), ensuring omniseal is correctly oriented.

19.5 Lightly lubricate the ‘O’ ring (11) with LM grease and install on the seal ring (10).

19.6 Push the assembled seal ring into position on the tilt drag housing (22).

19.7 Install the drag shoe assembly (12) on the tilt drag housing (22) and secure lightly with screw (13), using Loctite 222E.

19.8 Position two drag wedges (20) and the drag actuator block (14) in the drag shoe assembly (12), trapping the drag actuator block under the cut-out of the tilt drag housing boss (22).

19.9 Screw the special thumb screw (3441-910TL) through the tilt drag housing and into the drag actuator block. Tighten the thumb screw until the drag shoe (12) begins to expand, then tighten screw (13) fully, but do not overtighten. Unscrew the thumb screw slightly.

19.10 Install the assembled tilt drag mechanism in the mechanism side cover (19).

19.11 Using a syringe through the plug holes (8), fill the bowl with 12 cc of Vinten Fluid No. 3.

19.12 Install two plugs (8). Wipe off any excess fluid.

19.13 Remove the special thumb screw.

19.14 Lightly lubricate the thrust bearing (24) with LM grease. Install a thrust washer (23), the thrust bearing (24) and a second thrust washer (23) on the shaft of the tilt drag knob (5).

19.15 Lightly lubricate the 'O' ring (25) with LM grease and install on the shaft of the pan drag knob (5).

19.16 Fill the spring hole in the tilt drag housing (22) with LM grease and install the spring (7) and the ball (6).

19.17 Holding the unit stationary, remove the special thumb screw and screw in the assembled tilt drag knob.

19.18 Install the pan drag indicator (3) on the pan drag knob (5) and secure with grubscrew (4).

19.19 Install the RH side plate on the assembled tilt drag mechanism and secure with three screws (1).

19.20 Referring to Fig 6.2, install the blanking cap (12) in the tilt drag assembly

20 To install the tilt drag unit (Fig 6.4):

20.1 Position the assembled tilt drag unit in the mechanism housing (27), ensuring that the pin on the spring actuator seats correctly in the needle roller (21). Secure with three screws (26).

Platform

21 To assemble the platform (Fig 6.2):

21.1 If removed, install the dowel pin (2) in the platform. Dowel pin should protrude 4.25 mm above platform surface.

21.2 Position the slide clamp block (8) on the spigot on the underside of the platform. Screw in the slide clamp shaft (6).

21.3 Position the slide release (10) and spring (9) in the underside of the platform.

21.4 Push in the platform slide (44) to hold the slide clamp block and slide release in position.

21.5 Screw in the slide clamp shaft (6) until the platform slide (44) is held securely. Position the knob (5) so that when it is turned fully counter-clockwise, the clamp is released and, when turned clockwise, the clamp is applied before the stop is reached. Secure the knob with screw (4).

22 To install the platform (Fig 6.2):

22.1 Position the platform on the head and secure with four screws (7)

Final assembly

23 To pre-load the balance spring (Fig 6.2):

23.1 Apply Loctite 222E to thread of screw (38) and install it through the hole in the mechanism housing.

23.2 Tighten screw until spring is lightly pre-loaded, then apply a further 2.5 turns.

23.3 Install self-adhesive mechanism housing label (40).

24 Install the pan and tilt brake knobs (See “Brake knob adjustment” on page 22).

25 The pan and tilt drag control knobs are set so that drag begins to be felt between 1 and 2 on the scale. To adjust the pan drag knob settings (Fig 6.3):

25.1 Release the pan brakes.

25.2 Turn the drag control knob (3) until the grub screw (4) is accessible. Slacken the grub screw by six turns.

25.3 Turn the indicator (2) to zero.

25.4 Hold the indicator (2) stationary and rotate the control knob to the right until drag begins to be felt.

25.5 Turn the indicator to 2.

25.6 Turn the drag control knob (3) and indicator (2) together until the grub screw (4) is accessible.Carefully tighten the grubscrew, adjusting the position of the control knob as necessary so that the grub screw seats correctly in a slot in the indicator and may be screwed fully home.

25.7 Decrease drag to zero.

25.8 Increase drag and ensure that drag begins to be felt at about 1 on the indicator. Repeat the above procedure until this can be achieved.

25.9 Adjust the tilt drag knob in a similar fashion, referring to Fig 6.4.

Section 6

Illustrated Parts List

Contents Para

Illustrations Page

Introduction

1 This parts list is issued for the Vision 8 (Black) pan and tilt head, manufactured by Vinten Broadcast Limited, Western Way, Bury St. Edmunds, Suffolk, IP33 3TB, England.

Ordering spare parts

2 Always quote the head serial number.

3 When ordering a spare part, please quote the part number, NOT the item number.

4 Certain items form part of -900SP series composite spare parts. These are detailed in Fig 6.8 and are indicated in the parts list by an asterisk (*).

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

Main assembly part numbers

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

Assembly	Part No.
Vision 8 (Black) pan and tilt head - main unit assembly	3841-11
Pan drag unit assembly	3841-12
Tilt drag unit assembly	3841-13
Tilt brake unit assembly	3841-14
Pan bar	3219-101
Bowl clamp assembly	3330-30
Camera mounting plate	3364-900SP

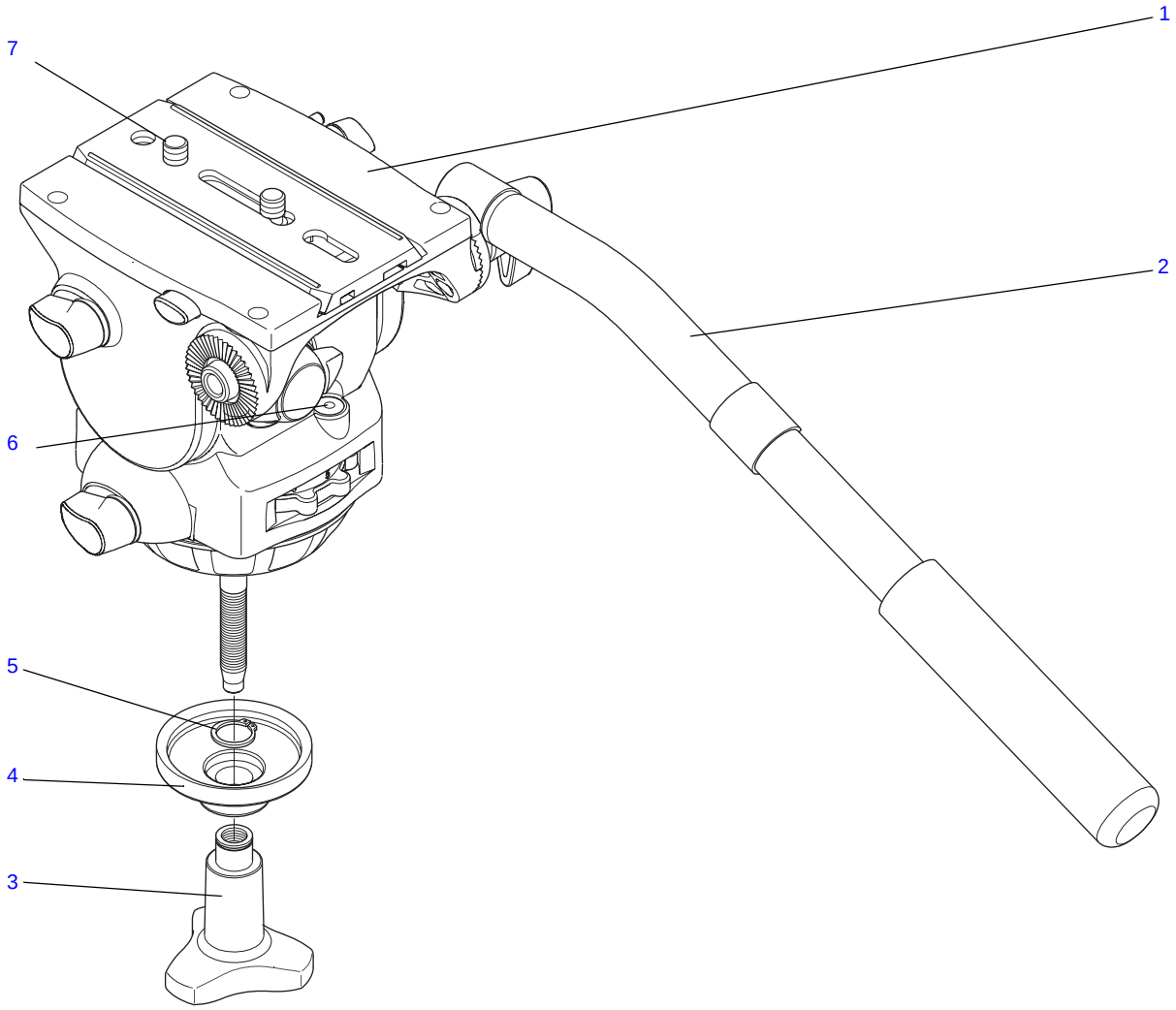


Fig 6.1 Vision 8 (Black) Pan and Tilt Head

Fig 6.1 Vision 8 (Black) Pan and Tilt Head

Item No.	Part No.	Nomenclature	Qty
1	3841-11	Main unit assembly (Fig 6.2), (Fig 6.3), (Fig 6.4), (Fig 6.5)	1
2	3219-101	Pan bar unit assembly, black, Vision 8 (Fig 6.5)	1
	3330-30	Bowl Clamp Knob Assy., comprising:	1
3	3330-31	Bowl Clamp Knob	1
4	3330-225	Bowl Clamp Cup	1
5	M701-031	Circlip, external, standard, 14 mm shaft dia. x 1.00 mm thick	1
6	—	Electrical installation (Fig 6.6)	
7	3170-202*	Screw (large)	1

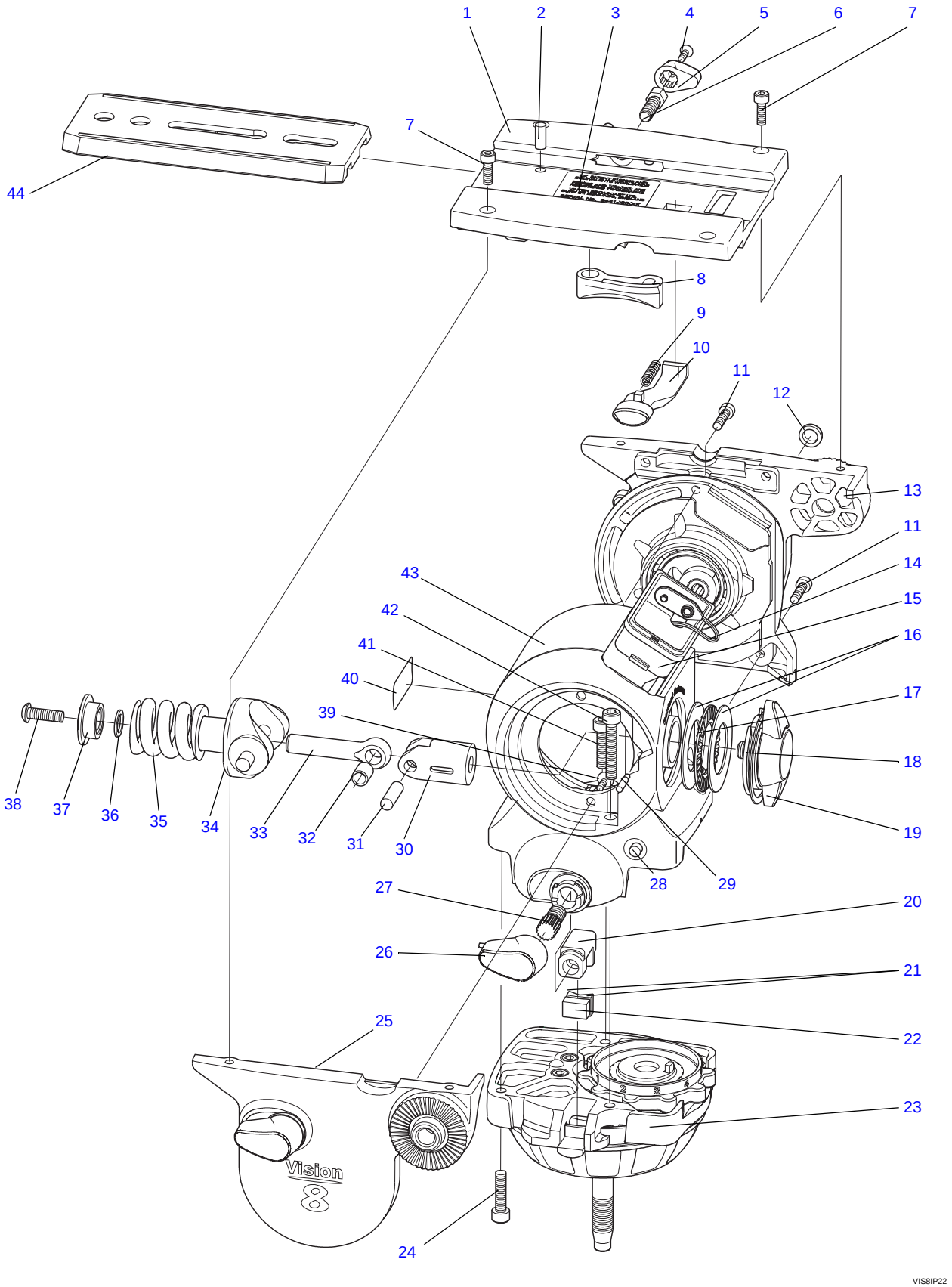


Fig 6.2 Vision 8 (Black) Pan and Tilt Head - Main Unit Assembly

Fig 6.2 Vision 8 (Black) Pan and Tilt Head - Main Unit Assembly

Item No.	Part No.	Nomenclature	Qty
1	3841-208	Platform, black	1
2	M801-048	Pin, dowel, 5 mm dia. x 12 mm long	1
3	3841-253	Label, serial number	1
4	M004-103	Screw, countersunk head, pozidrive, M3 x 8 mm long	1
5	3431-338	Platform clamp knob	1
6	3441-238	Slide clamp shaft	1
7	M005-718	Screw, cap head, socket, M4 x 12 mm long	4
8	3375-229	Slide clamp block	1
9	J532-109	Spring, compression, 3/4 in. free length, 5/32 in. hole dia., 4.5 lbf/in. rate	1
10	3441-219	Slide release	1
11	M005-706	Screw, cap head, socket, M4 x 16 mm long	3
12	3841-252	Blanking plug, black	1
13	3841-13	Tilt drag unit assembly	1
14	3441-261	Battery connector - part of PCB illumination unit (Fig 6.6)	1
15	3841-222*	Battery housing (Fig 6.6)	1
16	P602-021	Washer, thrust, bearing, 25 mm ID x 42 mm OD x 1 mm thick	2
17	P602-020	Bearing, needle roller, thrust, 25 mm ID x 42 mm OD x 2 mm long, with cage assembly	1
18	3390-232	Spiral ring	1
19	3431-16	Balance knob moulding assembly	1
20	3441-210	Pan brake calliper	1
21	3441-232	Inner brake pad (pan)	2
22	3441-233	Outer brake pad (pan)	1
23	3841-12	Pan drag unit assembly (Fig 6.3)	1
24	M006-704	Screw, cap head, socket, M5 x 16 mm long	1
25	3841-14	Tilt brake unit assembly (Fig 6.5)	1
26	3431-24	Brake knob assembly	1
27	3441-236	Brake shaft (pan)	1
28	J550-108	Cap, push-button for 0.100 in. dia. Plungers (Fig 6.6)	
29	3441-264	Adjustment slide pin	1
30	3442-202	Adjustment slide	1

Fig 6.2 Vision 8 (Black) Pan and Tilt Head - Main Unit Assembly (Cont)

Item No.	Part No.	Nomenclature	Qty
31	M801-021	Pin, dowel, 6 mm dia. x 20 mm long	1
32	P001-020	Bearing, plain, du bush, 6 mm ID x 8 mm OD x 8 mm long	1
33	3441-226	Spring actuator shaft	1
34	3441-901SP*	Spring actuator (spare)	1
35	3441-244	Spring (Vision 8)	1
36	3325-337	Buffer	1
37	3441-228	End washer	1
38	M006-506	Screw, button head, socket, M5 x 16 mm long	1
39	M005-901	Screw, countersunk head, socket, M4 x 8 mm long	2
40	3431-289	Mechanism housing label	1
41	M006-707	Screw, cap head, socket, M5 x 30 mm long	1
42	M006-703	Screw, cap head, socket, M5 x 12 mm long	1
43	3841-909SP*	Mech. Housing (spare, illuminated version)	1
44	3364-900SP*	Platform slide assembly	1

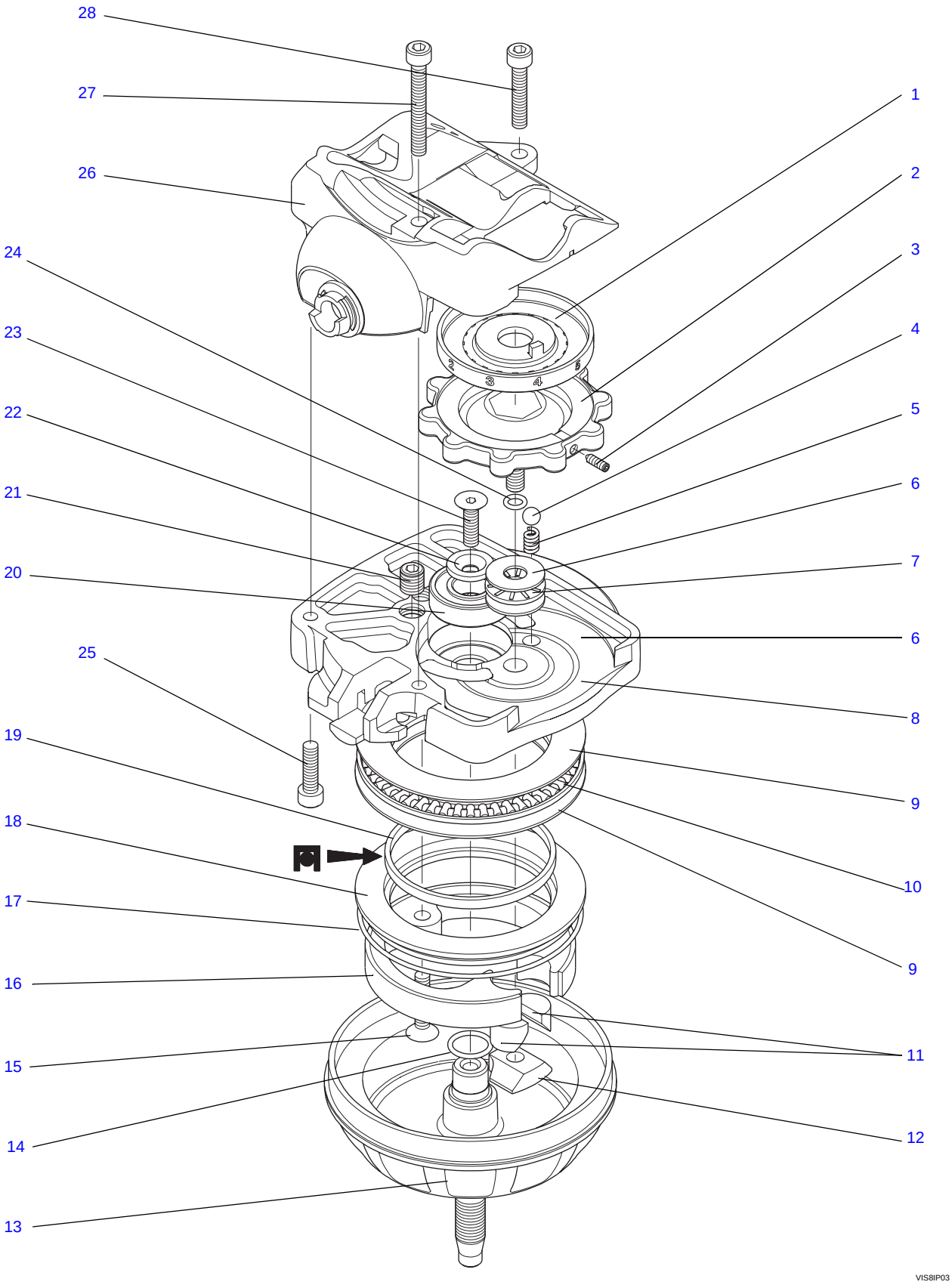


Fig 6.3 Vision 8 (Black) Pan and Tilt Head - Pan Unit Assembly

Fig 6.3 Vision 8 (Black) Pan and Tilt Head - Pan Unit Assembly

Item No.	Part No.	Nomenclature	Qty
	3841-12	Pan drag unit assembly, comprising	1
1	3441-22	Pan drag indicator assembly	1
2	3441-25	Pan drag knob assembly	1
3	M004-813	Screw, grub, cup point, socket head, M3 x 10 mm long	1
4	P900-012	Ball, steel, 6 mm dia.	1
5	J532-189	Spring, compression, 0.500 in. free length, 0.210 in. OD x 0.219 in. hole dia., 9.00 lbf/in. rate	1
6	P602-041	Washer, thrust, bearing, 8 mm ID x 21 mm OD x 1 mm thick	2
7	P602-040	Bearing, needle roller, thrust, 8 mm ID x 21 mm OD x 2 mm long, with plastic cage assembly	1
8	3841-206	Pan drag housing, black	1
9	P602-048	Washer, thrust, bearing, 55 mm ID x 78 mm OD x 1 mm thick	2
10	P602-047	Bearing, needle roller, thrust, 55 mm ID x 78 mm OD x 3 mm long, with cage assembly	1
11	3441-221	Drag wedge	2
12	3441-259	Drag actuator block	1
13	3441-903SP*	Spherical base (spare)	1
14	R900H019	'O'-Ring, 12.5 mm ID x 1.6 mm section, hardness 60 IRHD	1
15	M006-905	Screw, countersunk head, socket, M5 x 20 mm long	1
16	3441-24	Drag shoe assembly	1
17	R900H132	'O'-Ring, 70 mm ID x 1.50 mm section, hardness 70 IRHD	1
18	3441-225	Seal plate (pan)	1
19	Q500-051	'Omniseal', 2.127 in. shaft dia. x 3/32 in. nominal section	1
20	P200-201	Bearing, ball, radial, 12 mm ID x 28 mm OD x 8 mm long, two shields	1
21	M850-053	Fastener, conical plug, 8mm dia. x 8mm long	2
22	3441-231	Clamp washer (pan)	1
23	M006-911	Screw, countersunk head, socket, M5 x 12 mm long	1
24	R900H133	'O'-Ring, 5 mm ID x 1.50 mm section, hardness 60 IRHD	1
25	M006-704	Screw, cap head, socket, M5 x 16 mm long	1
26	3841-909SP*	Mechanism housing, spare, black (Fig 6.2)	1
27	M006-707	Screw, cap head, socket, M5 x 30 mm long (Fig 6.2)	1
28	M006-703	Screw, cap head, socket, M5 x 12 mm long (Fig 6.2)	1

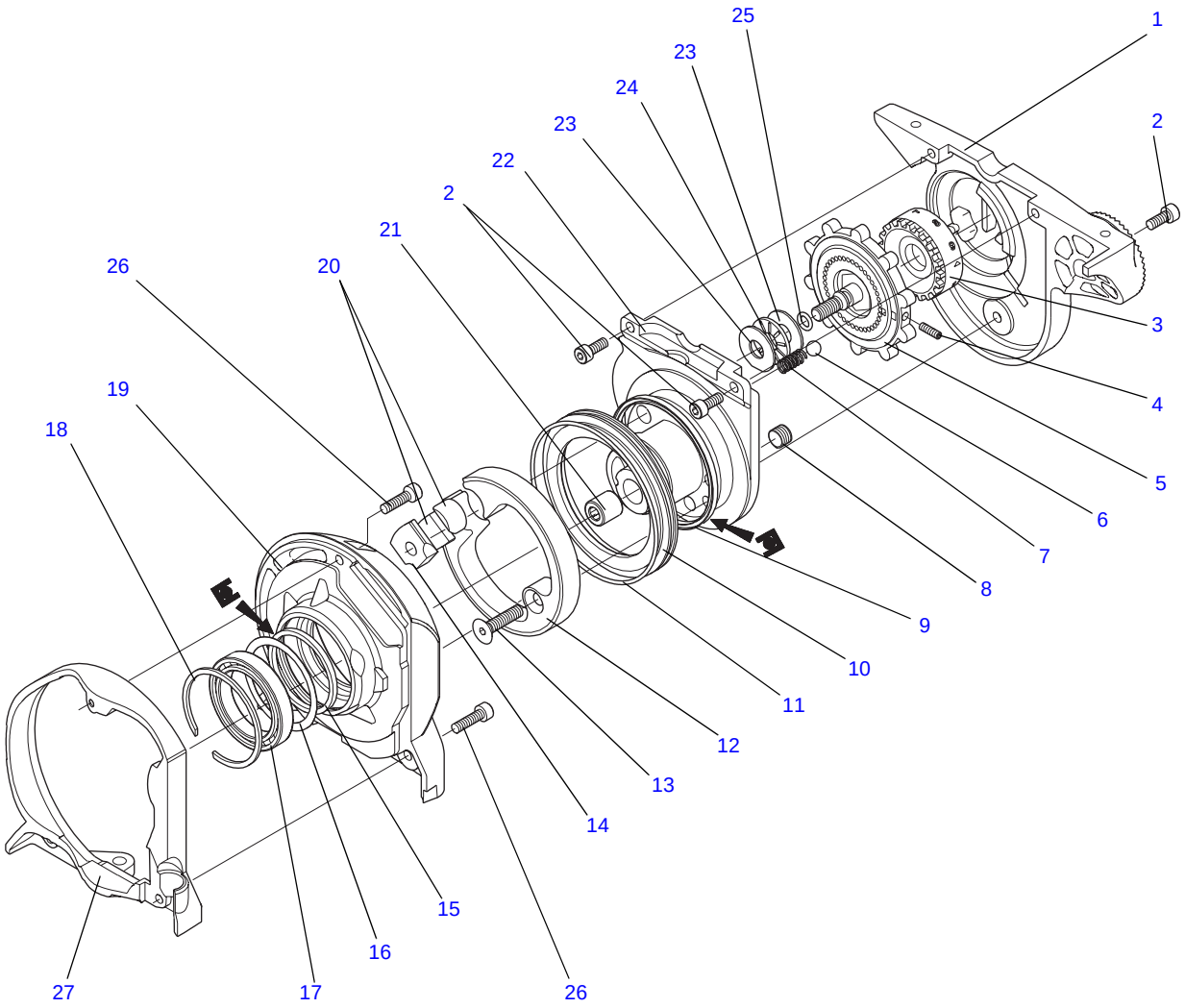


Fig 6.4 Vision 8 (Black) Pan and Tilt Head - Tilt Drag Unit Assembly

Fig 6.4 Vision 8 (Black) Pan and Tilt Head - Tilt Drag Unit Assembly

Item No.	Part No.	Nomenclature	Qty
	3841-13	Tilt drag unit assembly, comprising:	1
1	3841-904SP*	RH side plate (spare), black	1
2	M005-734	Screw, low-profile, cap head, socket, M4 x 10 mm long	3
3	3441-23	Tilt drag indicator assembly	1
4	M004-813	Screw, grub, cup point, socket head, M3 x 10 mm long	1
5	3441-26	Tilt drag knob assembly	1
6	P900-012	Ball, steel, 6 mm dia.	1
7	J532-189	Spring, compression, 0.500 in. free length, 0.210 in. OD x 0.219 in. hole dia., 9.00 lbf/in. rate	1
8	M850-053	Fastener, conical plug, 8mm dia. x 8mm long	2
9	Q500-051	'Omniseal', 2.127 in. shaft dia. x 3/32 in. nominal section	1
10	3441-256	Tilt seal ring	1
11	R900H132	'O'-Ring, 70 mm ID x 1.50 mm section, hardness 70 IRHD	1
12	3441-24	Drag shoe assembly	1
13	M006-905	Screw, countersunk head, socket, M5 x 20 mm long	1
14	3441-259	Drag actuator block	1
15	Q500-054	'Omniseal', 33.0 mm shaft dia. x 2.3 mm nominal section	1
16	3441-250	Seal shim	1
17	P302-011	Bearing, ball, radial, 30 mm ID x 42 mm OD x 7 mm long	1
18	P606-002	Snap ring, internal, 42 mm bore dia. x 1.5 mm thick	1
19	3841-202	Mechanism side cover, black	1
20	3441-221	Drag wedge	2
21	N500-023	Bearing, needle roller, radial, full complement, 1/4 in. ID x 7/16 in. OD x 7/16 in. long	1
22	3841-203	Tilt drag housing, black	1
23	P602-041	Washer, thrust, bearing, 8 mm ID x 21 mm OD x 1 mm thick	2
24	P602-040	Bearing, needle roller, thrust, 8 mm ID x 21 mm OD x 2 mm long, with plastic cage assembly	1
25	R900H133	'O'-Ring, 5 mm ID x 1.50 mm section, hardness 60 IRHD	1
26	3841-909SP	Mechanism housing, spare, black (Fig 6.2)	1
27	M005-706	Screw, cap head, socket, M4 x 16 mm long (Fig 6.2)	3

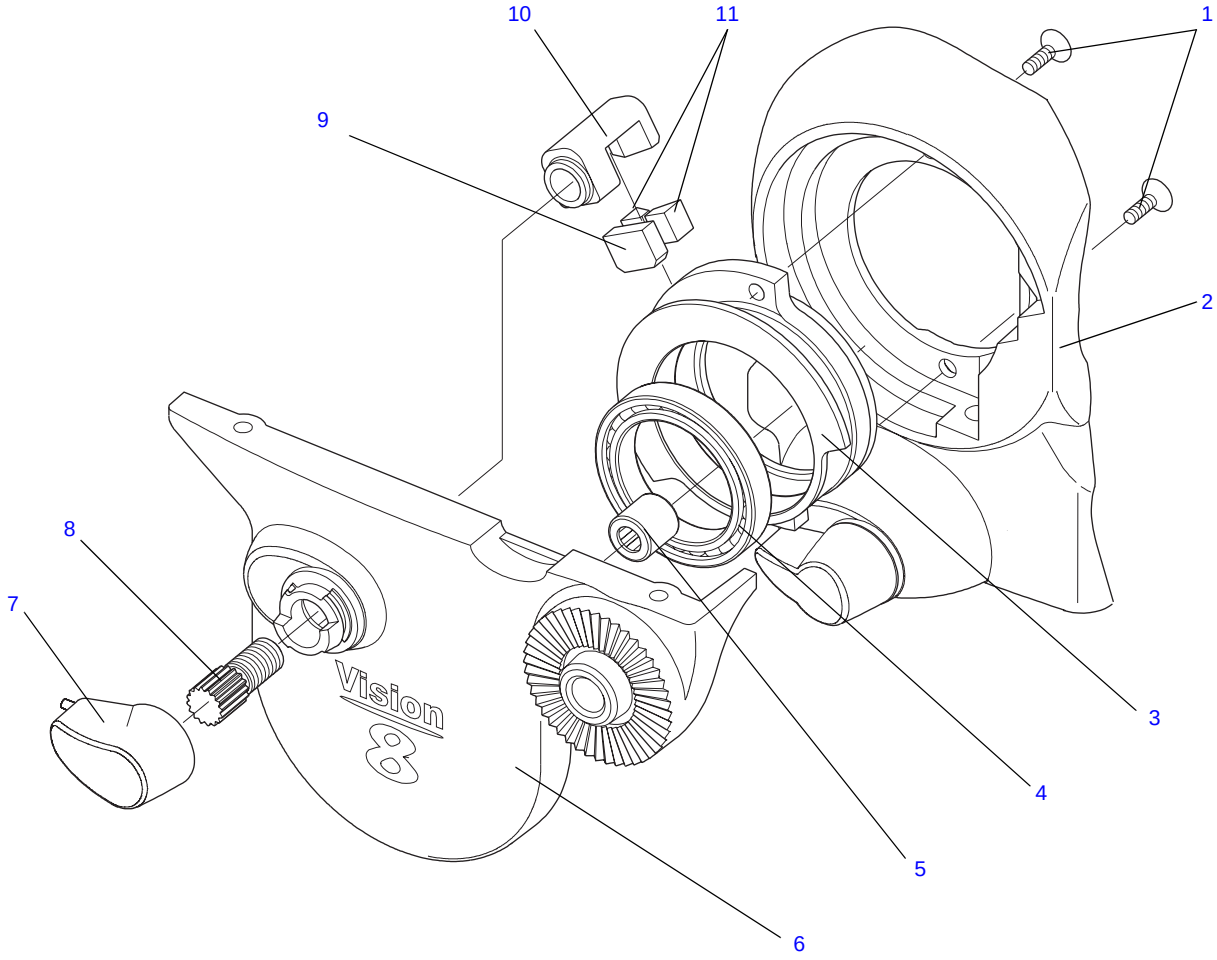


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Fig 6.5 Vision 8 (Black) Pan and Tilt Head - Tilt Brake Unit Assembly

Fig 6.5 Vision 8 (Black) Pan and Tilt Head - Tilt Brake Unit Assembly

Item No.	Part No.	Nomenclature	Qty
1	M005-901	Screw, skt csk hd, M4 x 8 mm (Fig 6.2)	2
2	3841-909SP*	Mechanism housing, spare, black (Fig 6.2)	1
	3841-14	Tilt brake unit assembly, comprising:	1
3	3441-212	Tilt brake disc	1
4	P302-011	Bearing, ball, radial, 30 mm ID x 42 mm OD x 7 mm long	1
5	N500-023	Bearing, needle roller, radial, full complement, 1/4 in. ID x 7/16 in. OD x 7/16 in. long	1
6	3841-905SP*	LH side plate (spare)	1
7	3431-24*	Brake knob assembly	1
8	3441-237	Brake shaft (tilt)	1
9	3441-235	Outer brake pad (tilt)	1
10	3441-211	Tilt brake calliper	1
11	3441-234	Inner brake pad (tilt)	2

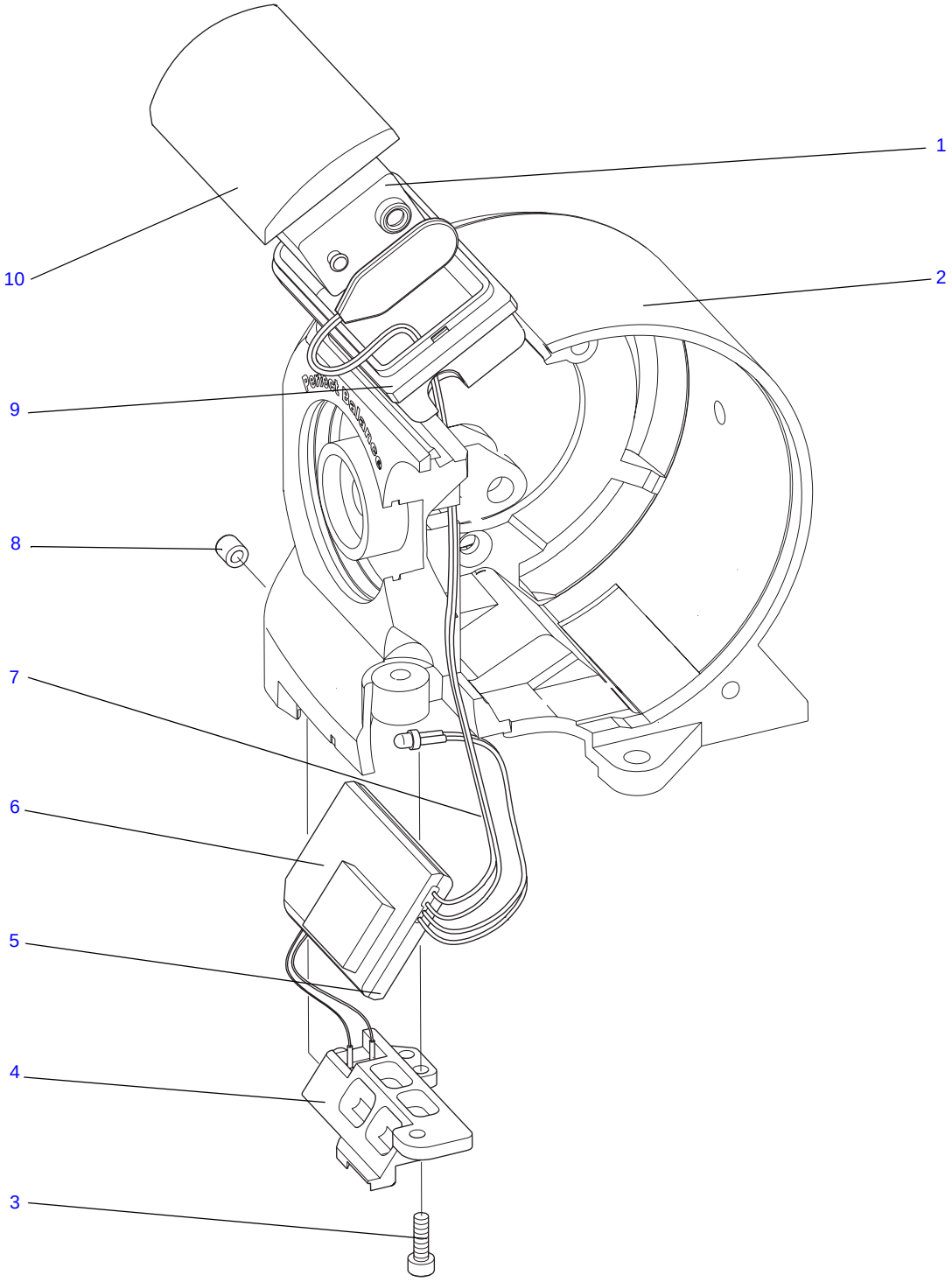

Fig 6.6 Vision 8 (Black) Pan and Tilt Head - Electrical Installation

Fig 6.6 Vision 8 (Black) Pan and Tilt Head - Electrical Installation

Item No.	Part No.	Nomenclature	Qty
1	C550-023	Battery, 9 Volts, Size - pp3	1
2	3841-909SP	Mechanism housing, spare, black (Fig 6.2)	1
3	M004-702	Screw, cap head, socket, M3 x 6 mm long	3
	3441-27	PCB unit assembly, comprising:	1
4	3441-247	PCB mounting	1
5	3441-240	PCB housing , bottom	1
6	3441-260	PCB housing, top	1
7	3441-261	PCB, illumination unit, including push-button switch, battery connector and level bubble LED	1
8	J550-108	Cap, push-button for 0.100 in. dia. Plungers	1
9	3841-222*	Battery housing, black	1
10	3841-223*	Battery cover, black	1

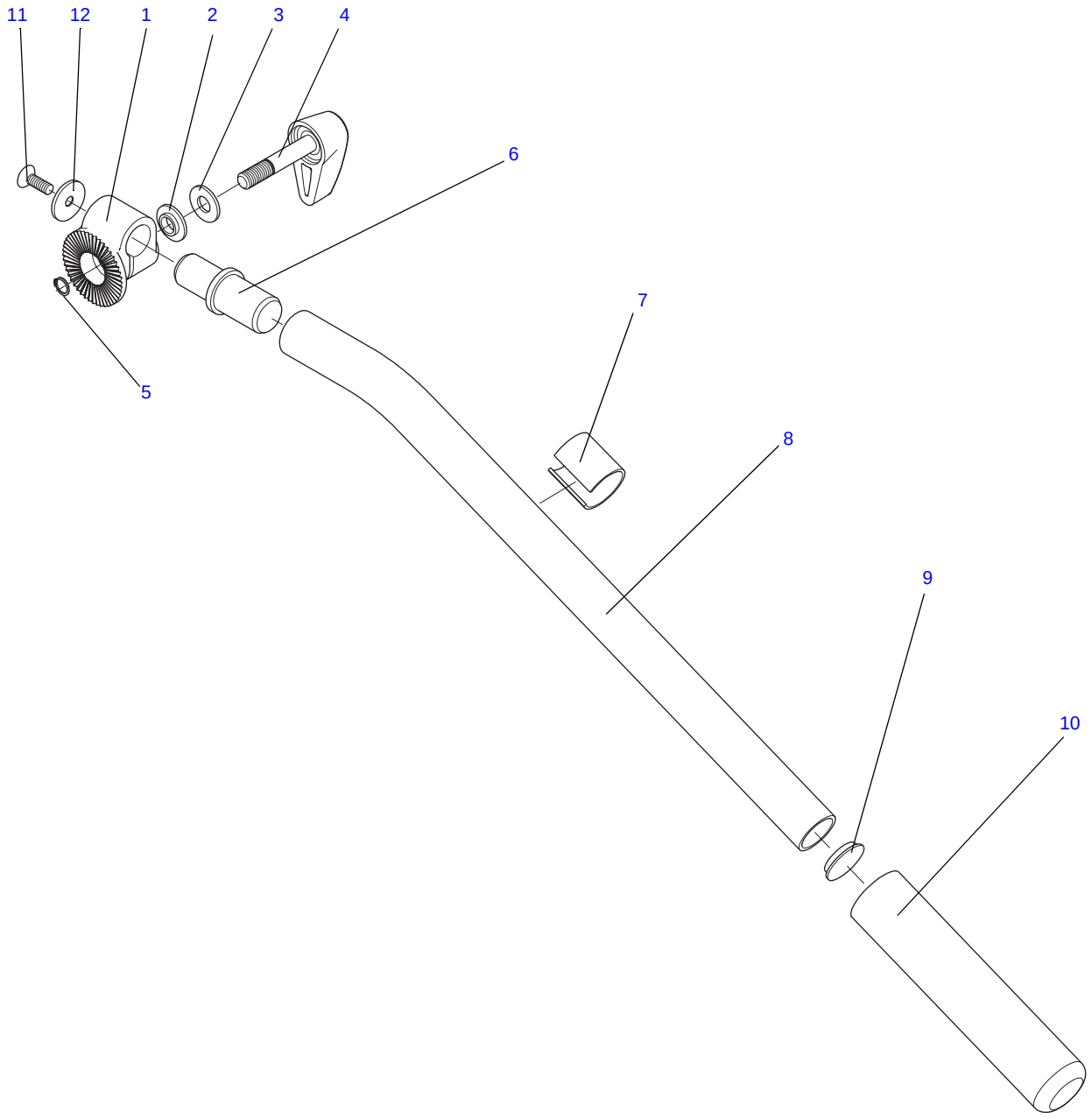

Fig 6.7 Vision 8 (Black) Pan and Tilt Head - Pan Bar Unit Assembly

Fig 6.7 Vision 8 (Black) Pan and Tilt Head - Pan Bar Unit Assembly

Item No.	Part No.	Nomenclature	Qty
	3219-101	Pan bar unit assembly, black, Vision 8, consisting of:	
	3219-90	Pan bar clamp assembly, comprising:	1
1	3219-318	Pan bar clamp	1
2	G249-007	Sleeve, insulation, head diameter 18 mm, body diameter 10.9 mm	1
3	M600-009	Washer, plain, heavy, M8	1
4	3219-75	Pan Bar Clamp Knob Assembly.	1
5	L701-004	Circlip, external, standard, 0.312 in. shaft dia. x 0.025 in. thick	1
	3219-100	Pan bar assembly, black, Vision 8, comprising:	1
6	3219-229	Pan bar spigot (Vision 10)	1
7	3219-227	Pan bar sleeve	1
8	3219-323	Pan bar	1
9	J550-074	Plug, tube-end, to fit 7/8 in. tube OD	1
10	3219-239	Pan bar grip	1
11	M006-113	Screw, countersunk head, pozidrive, M5 x 12 mm long	1
12	M606-001	Washer, nylon spacer, 5.3 mm ID x 18 mm OD x 3.8 mm thick	1

Fig 6.8 Vision 8 (Black) Pan and Tilt Head - Composite Spare Parts

Part No	Nomenclature	Qty
3364-900SP	Platform slide assembly, comprising:	
3364-210	Platform slide	1
Q300-128	Rubber strip, 1.78 mm dia	2
3170-202	Screw (large)	2
3441-901SP	Spring actuator (spare), comprising:	
3441-209	Spring actuator	1
L801-098	Pin, dowel, oversize, 1/4 in. dia. x 3/4 in. long	2
3441-903SP	Spherical base (spare), comprising:	
3441-207	Spherical base	1
3441-224	Pan shaft	1
3841-904SP	RH side plate (spare), black, comprising:	
3841-204	Side plate right hand, black	1
L850-032	Threaded-insert, wire thread insert (helicoil), 5/16 in. BSF x 1-1/2 Diameters long	1
3841-905SP	LH side plate (spare), black, comprising:	
3841-263	Side plate, left hand, black	1
L850-032	Threaded-insert, wire thread insert (helicoil), 5/16 in. BSF x 1-1/2 Diameters long	1
N500-023	Needle roller bearing	1
3841-906SP	Tilt drag housing (spare), black, comprising:	
3841-203	Tilt drag housing, black	1
N500-023	Bearing, needle roller, radial, full complement, 1/4 in. ID x 7/16 in. OD x 7/16 in. long	1
3841-908SP	Battery housing and cover, black, comprising:	
3841-222	Battery housing, black	1
3841-223	Battery cover, black	1

Fig 6.8 Vision 8 (Black) Pan and Tilt Head - Composite Spare Parts (Cont)

Part No	Nomenclature	Qty
3841-909SP	Mechanism housing, spare, black, comprising:	
3841-262	Mechanism housing, illuminated, black	1
J501-004	Level-bubble, 12mm dia, 7mm high, cylindrical, bottom plain white, clear filling, sensitivity 50-70 minutes per 2mm bubble movement. Supplier Engelbert Hipp KG.	1