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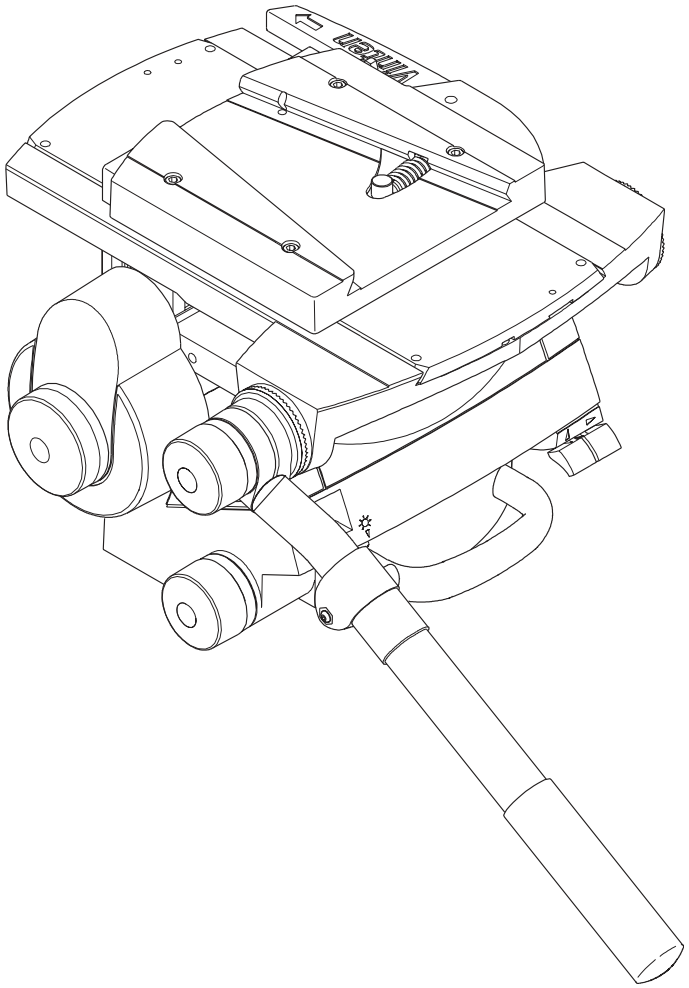
Maintenance Manual

Vector 700/700H

Pan and Tilt Head



Vinten

Camera Control Solutions

Vector 700/700H

PAN AND TILT HEAD
3448

MAINTENANCE MANUAL
AND
ILLUSTRATED PARTS LIST

PUBLICATION PART No. 3448-9

ISSUE 2

Foreword

This manual provides full and detailed information on the maintenance and spare parts for the Vinten® Vector 700 and 700H pan and tilt heads.

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 head. Attention to the details contained herein will ensure that the 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 ‘Vector 700/700H Pan and Tilt Head Maintenance Manual’ (3448-9). 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.

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Alternatively, you may use the Acrobat Reader navigation buttons.

Safety - Read This First!

Warning symbols in this maintenance manual

Where there is a risk of personal injury, injury to others, or damage to the 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 wedge adapter)

Vector V700 . . . . . 18.85 kg (41.5 lb)
Vector V700H . . . . . 19.15 kg (42.1 lb)

Load

Maximum payload . . . . . 70 kg (154 lb)

Contents

Illustrations

Page

Associated Publication

Vector 700/700H Pan and Tilt Head Operators Guide - Publication Part No. 3448-8

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

Maximum payload . . . . . 70 kg (154 lb)

Payload Centre of Gravity height range

- Vector V700 . . . . . 80 mm (3 in.) to 200 mm (8 in.)
- Vector V700H . . . . . 80 mm (3 in.) to 250 mm (10 in.)

Weight (complete with pan bar and wedge adaptor)

- Vector V700 . . . . . 18.85 kg (41.5 lb)
- Vector V700H . . . . . 19.15 kg (42.1 lb)

Overall dimensions

- Height (flat base with wedge adaptor)
  - Minimum balance setting . . . . . 247 mm (9.7 in.)
  - Maximum balance setting . . . . . 349 mm (13.7 in.)
- Length (without pan bar) . . . . . 354 mm (13.9 in.)
- Width (without pan bar) . . . . . 350 mm (13.8 in.)
- Width (with two pan bars) . . . . . 432 mm (17.0 in.)

Tilt range

- Vector 700 . . . . . ±60°
- Vector 700H . . . . . ±52°

Pan range . . . . . 360°

Design Improvements

DETAILS	SERIAL No. INFORMATION
Vertical track member strengthened	288
Changes to adjustment housing	785
Platform strengthened	V700 - 722 V700H - 202

Section 1

Introduction and Description

Contents **Para**

Introduction

1 The Vinten Vector 700 and 700H pan and tilt heads are designed for studio and outside broadcast (OB) use and will support a variety of camera, lens and prompter combinations up to 70 kg (154 lb) in weight.

2 The unique counterbalance system enables payloads with centre of gravity (C of G) heights from 80 mm (3 in.) to 200 mm (8 in.) for Vector 700 and 80 mm (3 in.) to 250 mm (10 in.) for Vector 700H to be maintained in perfect balance over the tilt movement range of ±60° (±52° for Vector 700H).

3 Drag is provided by the Vinten thin-film (TF) system which provides stepless adjustment of drag. A wide variation of the drag setting to suit operator preference is available on both pan and tilt axes and 'whip' movements may be executed irrespective of drag setting. The pan and tilt axes are each provided with a brake.

4 The head is fitted with a sliding plate giving a large range of fore and aft adjustment. This adjustment can be extended by moving a wedge adaptor to one of three positions on the sliding plate.

5 The head is available with either a standard flat base or a light-weight Mitchell adaptor and can be mounted on tripods, pedestals or any suitable firm surface. It is fitted with an illuminated level bubble to facilitate levelling. A carrying handle is provided.

Description

6 The Vector 700 pan and tilt head (Fig 1.1) embodies a linkage counterbalancing mechanism, TF drag assemblies for pan and tilt motions and an adjustable camera mounting plate.

7 The balance system is easily adjusted by a knob (10) on the right-hand side of the head. The balance adjustment control compensates for differing platform load C of G heights by varying the mechanical advantage of a bell-crank in the counterbalance mechanism.

8 Both the pan and tilt mechanisms incorporate TF drag systems to ensure smooth movement of the camera about these axes and are fitted with control knobs (16)(17) to adjust the drag setting. The drag controls are mounted on the left-hand side of the head. The whip-pan facility is unaffected by the pan drag setting.

9 Friction brakes on each axis allow the head to be locked at any chosen position. The operating levers for both brakes (2)(3) are fitted at the right-hand rear of the head. A tilt axis centre lock (11) is provided on the right-hand side of the head to secure the platform in the horizontal position during transport or load changing.

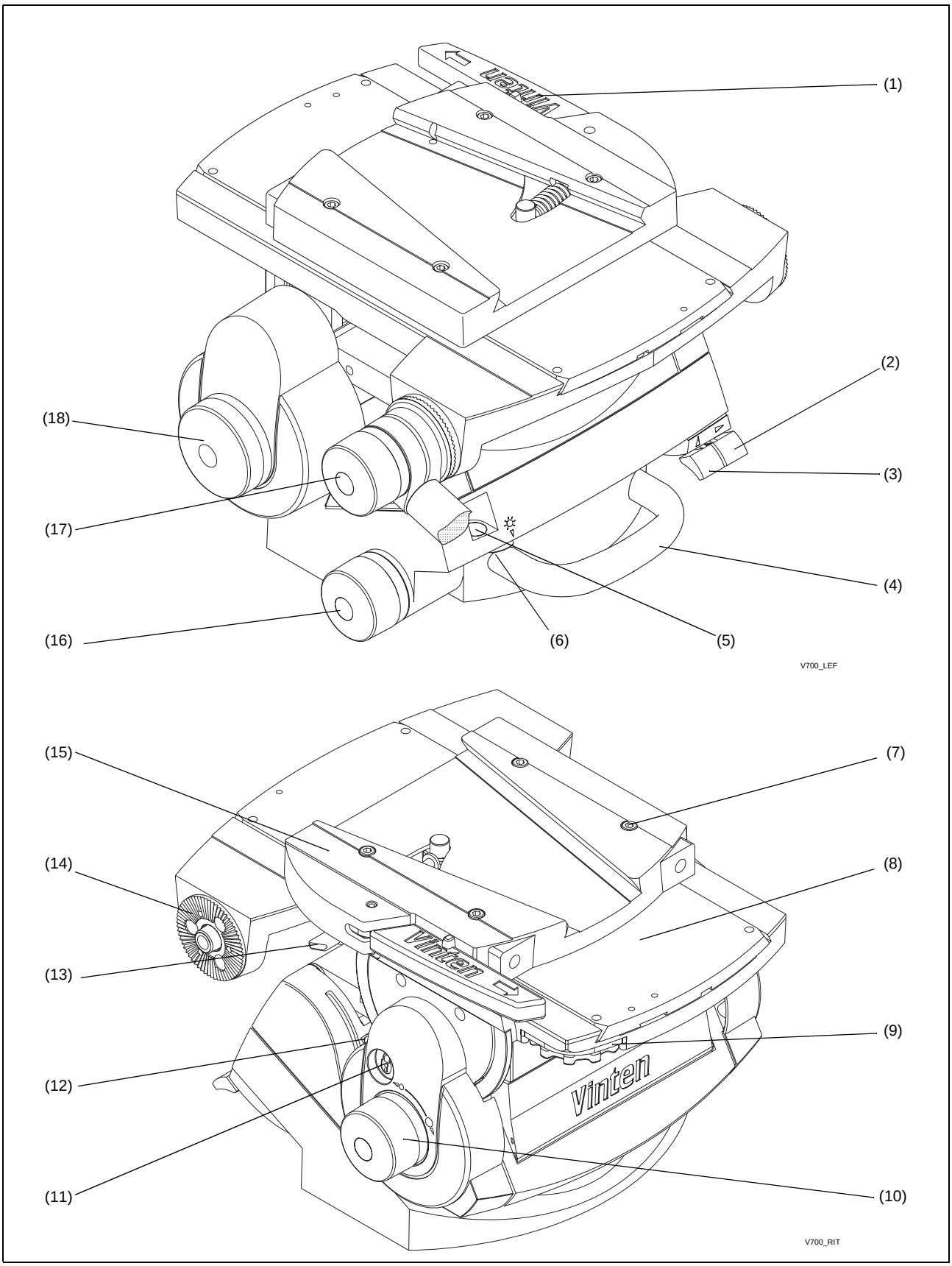


Fig 1.1 Vector 700/700H Pan and Tilt Head

10 A level bubble (5) is fitted to the rear of the head and is provided with a time-delay illumination unit operated by a switch (6).

11 Pan bar mounting points ((14) are located at the rear of the head, on either side of the camera mounting platform. A telescopic pan bar 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 and fixed and short fixed pan bars are available as an option.

Section 2

Installation and operation

Contents **Para**

Introduction

1 This section includes instructions for mounting the Vector 700 pan and tilt head, fitting and balancing a camera and operating the head. Refer to Fig 1.1 to identify the parts and controls. For further operating instructions, please refer to Vector 700/700H Operators Guide, Publication Part No. 3448-8.

Installation

Unpacking

2 The head is supplied with one pan bar, a battery (fitted) for the level bubble illumination unit and an Operators Guide. The flat base version is supplied with four mounting bolts, four washers and a spanner. The Mitchell fixing version is supplied with a light-weight Mitchell adaptor. A second telescopic pan bar or short pan bar for use with a zoom or focus controller are optional. Ensure that all items are unpacked prior to disposal of the packing materials.

3 After unpacking ensure that:

3.1 The centre lock (11) is engaged (See “Locking the platform” on page 17). Always engage the centre lock before lifting or carrying the head. Lift the head by the base and/or the carrying handle, not the platform.

3.2 The pan and tilt brakes are on (See “Pan and tilt brakes” on page 18)

Mounting the head

NOTE: When mounted on Vinten ‘Hawk’ or ‘Teal’ pedestals, clearance between the head and the pedestal weight tray prevents the use of 5.5 lb (1.6 kg) and 1.0 lb (0.47 kg) trim weights. Use alternative weights or fit the adaptor plate kit (Part No. 3354-900SP) between the head and pedestal.

Flat base

WARNING!: Before installing the head, hold a fixing bolt in position and check that the threaded end does not project more than 18 mm (3/4 in.) above the mounting face

4 The head is mounted on a tripod, pedestal or suitable firm surface using the four fixing bolts and washers. Tighten the bolts with the spanner provided.

5 After mounting the head, use the level bubble to set it level. The level bubble may be illuminated by pressing the switch). The light will go out after approximately 15 seconds.

Mitchell-type fixing

6 Remove the clamp knob and washer. Position the head on the tripod or pedestal, ensuring that the spigot is seated and the key is engaged in the slot. Refit the clamp washer and knob and tighten securely.

7 After mounting the head, use the level bubble to set it level. The level bubble may be illuminated by pressing the switch. The light will go out after approximately 15 seconds.

Pan bars

8 Fit the pan bar(s) to the head and adjust the position of each one before tightening the clamp on the mounting. Adjust the length of the telescopic pan bar(s).

Fitting a camera

WARNING!: Do not rely on the tilt brake when changing the payload. always engage the centre lock.
Ensure that the weight and C of G height of the total payload is within the range for which the head is designed - up to 70 kg (154 lb) with C of G height from 80 mm (3 in.) to 200mm (8 in.) for Vector 700 or 80 mm (3 in.) to 250 mm (10 in.) for Vector 700H.

9 To fit a camera, proceed as follows:

9.1 Lower the mounting to a convenient working height.

9.2 If not already fitted, install the wedge adaptor in the middle position on the sliding plate (See “Repositioning the wedge adaptor” on page 28).

9.3 Attach the wedge to the camera/lens.

9.4 Ensure that the centre lock is engaged (See “Locking the platform” on page 17).

9.5 Slide the wedge adaptor operating lever forward (parallel to the wedge) about 6mm (1/4 in.) against spring tension. Pull the operating lever out, away from the body of the wedge adaptor, as far as it will go.

9.6 Insert the camera wedge into the wedge adaptor and push it forward into full engagement. Push in the operating lever until it lies parallel with the wedge adaptor body. During this operation resistance of the spring-loaded over-centre mechanism will be felt. As the lever reaches the end of its travel it will slide back (parallel to the wedge) to the locked position.

9.7 Confirm that the lever is in the locked position. This is indicated by coloured bands above the lever. When the green band only is visible, the lever is locked. If any of the red band can be seen, the lever is not locked.

9.8 Install the remainder of the payload (lens, zoom and focus controls, viewfinder, prompter etc).

Balancing the head

NOTE: It is important that the pan bar(s) and all camera accessories (lens, zoom and focus controls, viewfinder, prompter etc.) are fitted in their operational position before balancing the head. Any equipment fitted or adjusted later will unbalance the head.

10 Balancing the head consists of positioning the payload fore and aft on the head so that its C of G is immediately above the platform pivot, then compensating for the payload C of G height using the balance adjustment knob.

11 Position the payload fore and aft as follows:

11.1 Ensure that the centre lock is engaged (See “Locking the platform” on page 17) and that the camera and all accessories are fitted.

11.2 Turn the tilt drag adjustment knob (17) to its minimum setting.

WARNING!: If the balance control is set to minimum, a heavy out-of-balance payload will cause the platform to tip violently when the centre lock is disengaged. Increase the C of G height setting (see below) prior to balancing a heavy payload.

11.3 Holding the pan bar to steady the platform, disengage the centre lock (12).

11.4 Release the sliding plate clamp (13) and turn the sliding plate adjustment knob (9) to move the sliding plate fore and aft to achieve horizontal balance. The horizontal balance is correct when no perceptible tilting force can be felt on the pan bar with the platform level. Apply the sliding plate clamp.

11.5 If there is insufficient movement in the sliding plate to achieve balance, reposition the wedge adaptor (See “Repositioning the wedge adaptor” on page 26), refit the load and repeat the horizontal balancing procedure.

12 When fore and aft balance has been achieved, carry out the payload C of G height adjustment as follows:

12.1 Using the pan bar, tilt the platform forward and backward. When correctly balanced, there should be no perceptible tilting force on the pan bar at any angle of tilt and the head should remain in any tilt position to which it is set.

12.2 If the head tends to fall away when the platform is tilted, push in and turn the balance adjustment knob (10) clockwise to increase the C of G height setting. If the head tends to spring back to centre, push in and turn the balance adjustment knob (10) counter-clockwise to decrease the C of G height setting.

NOTE: The balance adjustment knob is a multi-turn control. To enable the knob to be turned more easily, tilt the platform using the pan bar whilst turning the knob.

13 When the payload C of G height adjustment is complete, check that the fore and aft balance remains satisfactory. Re-adjust the position of the sliding plate if necessary.

14 After balancing, release the brakes (2)(3) and exercise the head through both axes to confirm that it operates smoothly.

Operation

Locking the platform

15 The centre lock mechanism is operated by a plunger (11) on the right-hand side of the head. The lock is engaged by holding the platform level and pushing the plunger inwards until the release lever (12) appears. Use the pan bar to rock the platform slightly whilst pushing the button. To release the centre lock, rock the platform slightly and push down on the release lever (12).

Pan and tilt brakes

16 The pan and tilt brakes are operated by levers (2)(3) at the rear of the head. They are applied by pulling the appropriate lever up and back and released by pushing the lever forwards. The brakes should be applied whenever the camera is left unattended.

Pan and tilt drag

17 The pan drag adjustment knob (16) is mounted on the left-hand lower part of the main body. Tilt drag is adjusted by a knob (17) mounted on the face of the tilt drag housing on the left-hand side of the head. Turn the knobs clockwise to increase drag and counter-clockwise to decrease drag.

WARNING!: Use only hand force to adjust drag. Do not over-tighten.

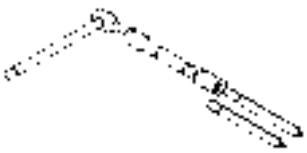
Section 3

Tools and Materials

General

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

Tools

	Item	Part No.	Use
	Extended 3 mm/4 mm AF spherical-ended hex wrench	3354-931TL	Removing tilt drag mechanism and support caps
	Pan bearing nut key	3448-902TL	Adjusting pan bearing nut

Consumable materials

Item	Part No.	Use
Loctite 222E	Z002-075	Thread locking
Loctite 270	Z002-034	Spring assembly
Loctite 290	Z002-012	Friction shoe pivots
Loctite 380	Z002-078	Adhesive
Loctite 415	Z002-062	Adhesive
Loctite 601	Z002-020	Lift-off stop pin
Loctite 638	Z002-058	Adhesive
Loctite 641	Z002-074	Bearing installation
Grease, Chesterton	Z150-105	Support cap lubrication
Grease, Castrol LM	Z150-122	General lubrication
Grease, Easyrun 50	Z150-081	Balance adjuster and balance mechanism bearings and shims
Loctite 406	Z002-086	Adhesive
Permabond ESP110	Z002-073	Adhesive

Section 4

Servicing

Contents **Para**

Introduction

1 The Vector 700/700H Pan and Tilt Heads are 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 service life with minimum need for repair.If the head becomes faulty reference should be made to Section 5 of this manual, or the unit may be returned to Vinten Broadcasting limited or your local dealer for repair.

Cleaning

2 During normal 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 wedge location faces of the wedge adaptor.

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.

3 Use out-of-doors under adverse conditions may require special attention and the head should be covered when not in use. Salt spray should be washed off using fresh water at the earliest opportunity. Sand and dirt act as an abrasive and should be removed using a semi-stiff brush or a vacuum cleaner.

Cleaning balance mechanism track

4 The balance mechanism tracks are automatically cleaned by built-in wipers, but after use in particularly adverse conditions the tracks may require cleaning. Some dismantling of the head is necessary and it is recommended that this be carried out in clean workshop conditions.

Vertical tracks

5 To clean the vertical tracks it is necessary to remove the platform. Proceed as follows (Fig 4.1):

5.1 Remove the payload (if fitted). It is not necessary to remove the wedge adaptor.

5.2 Release the sliding plate clamp (9). Use the adjustment knob (10) to wind the sliding plate(3) backwards until it is clear of fixing screws (1).

5.3 Level the platform.

5.4 Remove six screws (1) securing the platform (2) to the balance mechanism (4). Lift off the platform.

5.5 Using a pipe cleaner (or similar) moistened with an isopropanol-based cleaner (3M VBH or similar), clean the two vertical tracks (11). Upwards pressure on the balance mechanism will allow the area of track under the vertical rollers to be cleaned.

5.6 Install the platform (2) on the balance mechanism (4) and secure with six screws (1), using Loctite 222E.

5.7 Using the adjustment knob (10) wind the sliding plate forwards to the central position.

5.8 Refit the payload (if required) and rebalance the head.

Horizontal tracks

6 No dismantling is necessary to clean the horizontal tracks. Proceed as follow (Fig 4.1):

6.1 Remove the payload (if fitted). Set the balance mechanism to its maximum setting by pushing in the knob (8) and turning it clockwise to its stop.

6.2 Tilt the platform fully backwards and apply the tilt brake (7).

6.3 Pull down the flap guard (6) to reveal the bevel gear (5). Access to the horizontal tracks is through the holes in the bevel gear, which may be rotated freely.

6.4 Using a pipe cleaner (or similar) moistened with an isopropanol-based cleaner (3M VBH or similar), clean the two horizontal tracks. Upwards pressure on the balance mechanism will allow the area of track under the horizontal rollers to be cleaned.

6.5 Release the flap guard (6) and the tilt brake (7) and return the platform to the horizontal position.

6.6 Refit the payload (if required).

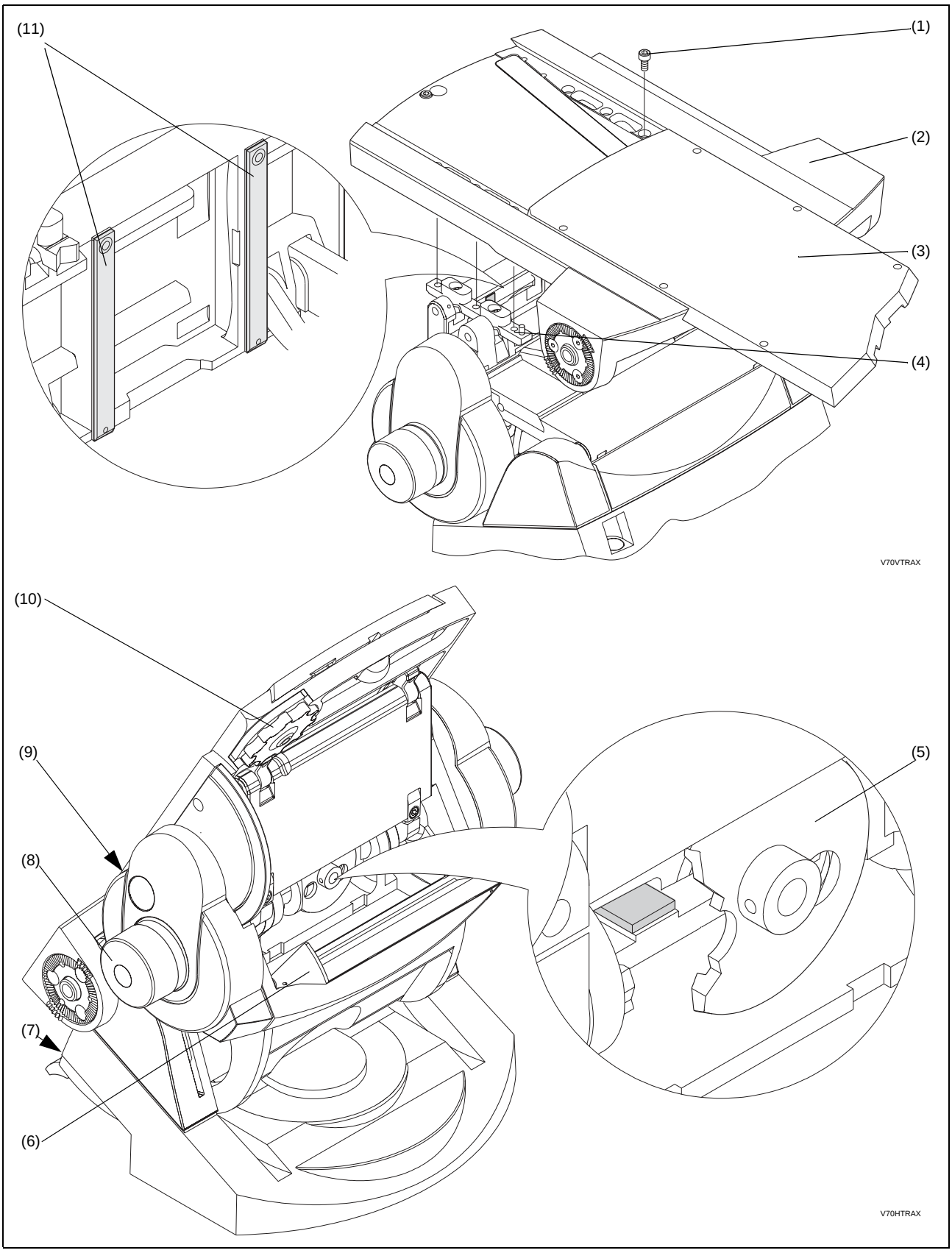


Fig 4.1 Cleaning Balance Mechanism Tracks

Routine checks and replacements

7 During normal use check the illumination of the level bubble. The battery should be replaced at yearly intervals or whenever the illumination is considered inadequate.

Level bubble illumination unit battery replacement

8 The level bubble on the Vector 70H pan and tilt head is illuminated by a battery-powered light-emitting diode (LED). A time-delay circuit initiated by a switch controls the LED. The battery should be replaced at yearly intervals or whenever the illumination is considered inadequate.

NOTE: Dependent on the type of mounting, it may be necessary to remove the head from the mounting for access to the battery compartment.

9 To install or replace the battery (Fig 4.2):

9.1 Remove three screws (1) which secure the battery compartment cover plate (4) to the head.

9.2 Install or replace the battery (2), pushing the connector (3) onto the battery terminals.

9.3 Position the battery in the battery compartment, ensuring that the wiring is not trapped.

9.4 Refit the battery cover plate (4), ensuring battery locates in cover plate. Secure with three screws (1).

9.5 Press the switch and ensure the lamp is lit for approximately 15 seconds.

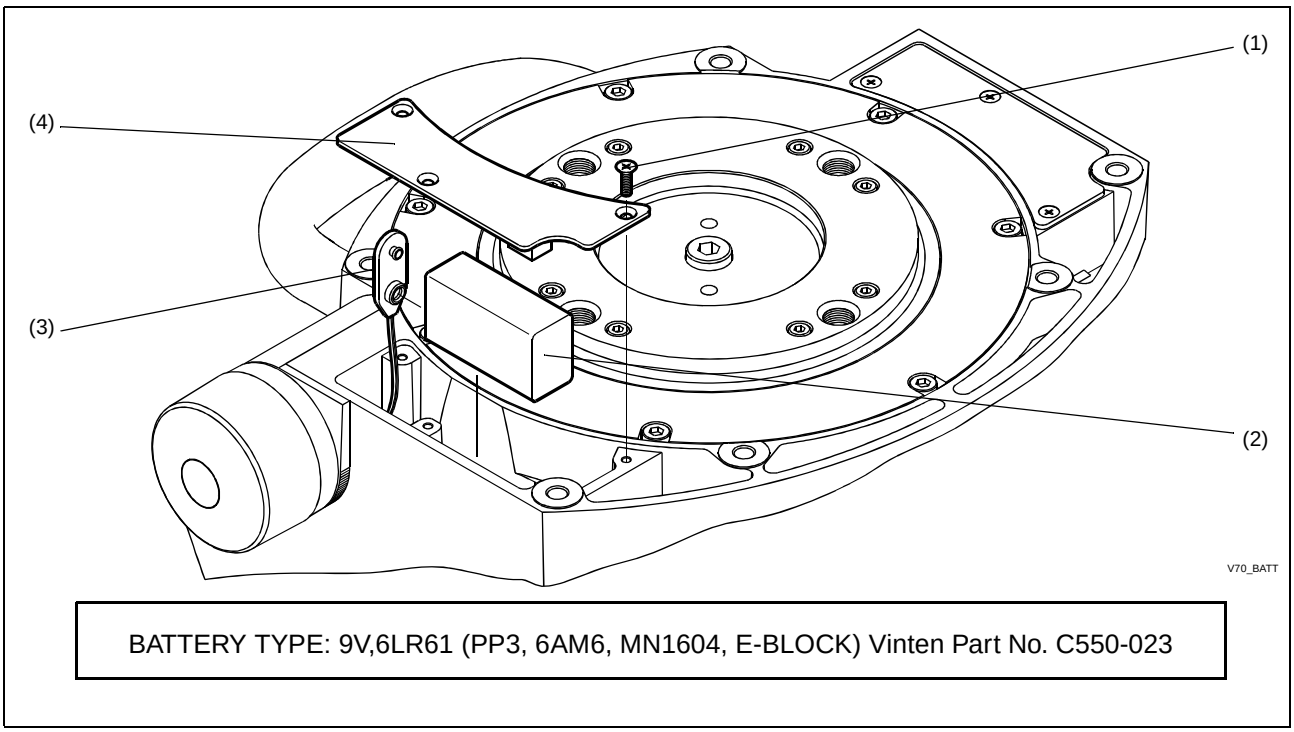


Fig 4.2 Level Bubble Illumination Unit Battery Replacement

Adjustments

10 After considerable use the platform slide clamp or pan and tilt brakes may require adjustment.

Platform slide clamp adjustment

11 The platform slide clamp should be set so that, in the up or clamped position it prevents the platform slide from being moved, while in the down or released position it allows free adjustment of the slide. To adjust the clamp, proceed as follows (Fig 4.3):

11.1 On the right-hand side of the platform, carefully remove the self-adhesive label (2) to reveal the slotted shaft (1).

11.2 Pull the slide clamp lever (4) fully upwards.

11.3 Slacken the clamp screw (3).

11.4 Using a torque screwdriver, turn the slotted shaft (1) fully clockwise to a torque of 4.0 Nm (35 lbf in.).

11.5 Tighten the clamp screw (3).

11.6 Move the lever over its full range and ensure that, in the clamped position, it prevents the slide from being moved, while in the released position it allows free adjustment of the slide. Re-adjust if necessary.

11.7 Replace the self-adhesive label (2) in the recess in the platform.

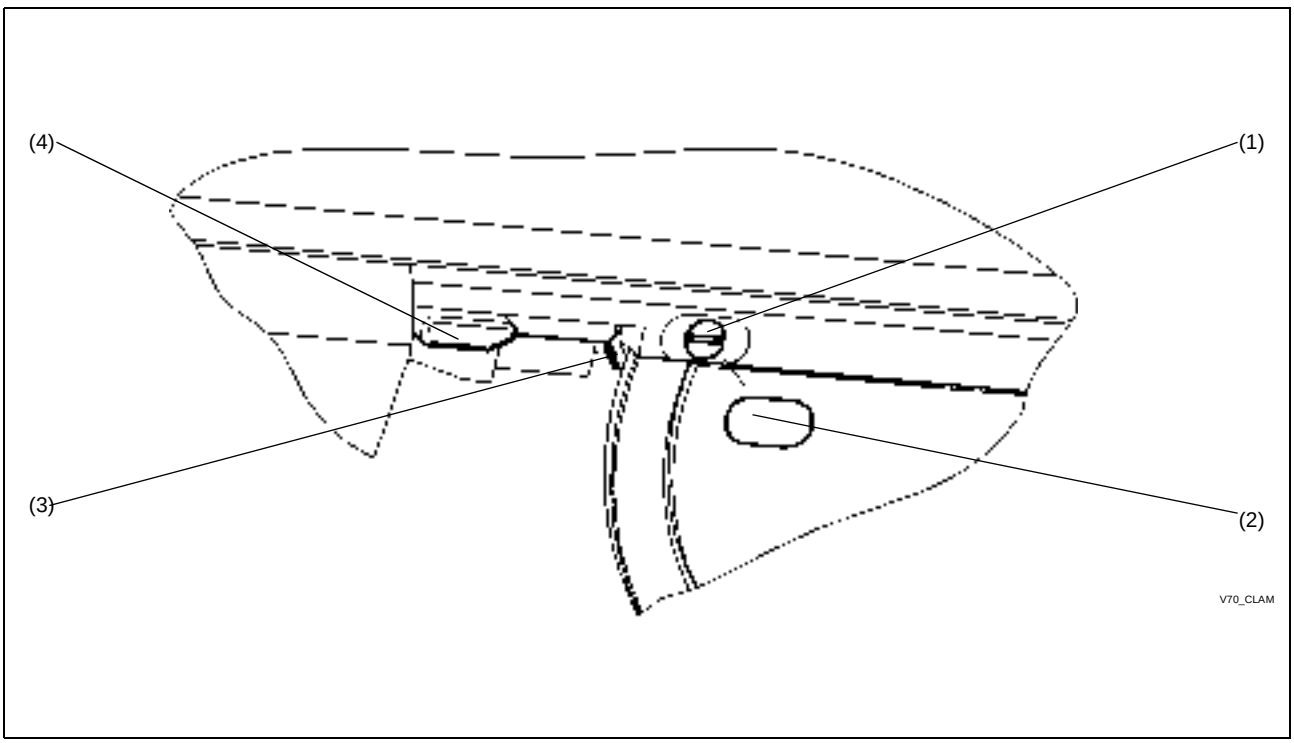


Fig 4.3 Platform Slide Clamp Adjustment

Pan and tilt brake adjustment

12 Following bedding-in, the pan and tilt brakes may require adjustment. The pan and tilt brakes should be set so that the brakes begin to be applied after approximately one-third of the lever travel (Fig 4.4).

13 The tilt brake is adjusted by inserting a 2 mm hexagon wrench through the hole (2) in the bottom of the tilt unit cover and turning the grub screw (1). To adjust the tilt brake, proceed as follows:

13.1 Operate the tilt brake lever (6) from the OFF to the ON position.

13.2 If brake pressure is not felt after approximately one-third of the lever travel, turn the grub screw (1) clockwise until this is achieved.

13.3 Operate the tilt brake lever (6) to the OFF position and ensure that the platform is free to move.

14 The pan brake is adjusted by turning the locating pin (5). To gain access to the pin it is necessary to remove the payload from the head, remove the head from its mounting and remove a cover plate (3) from the underside of the head. To adjust the pan brake, proceed as follows:

WARNING!: Remove the payload before adjusting the pan brake.

14.1 Remove the payload from the head.

14.2 Remove the head from its mounting.

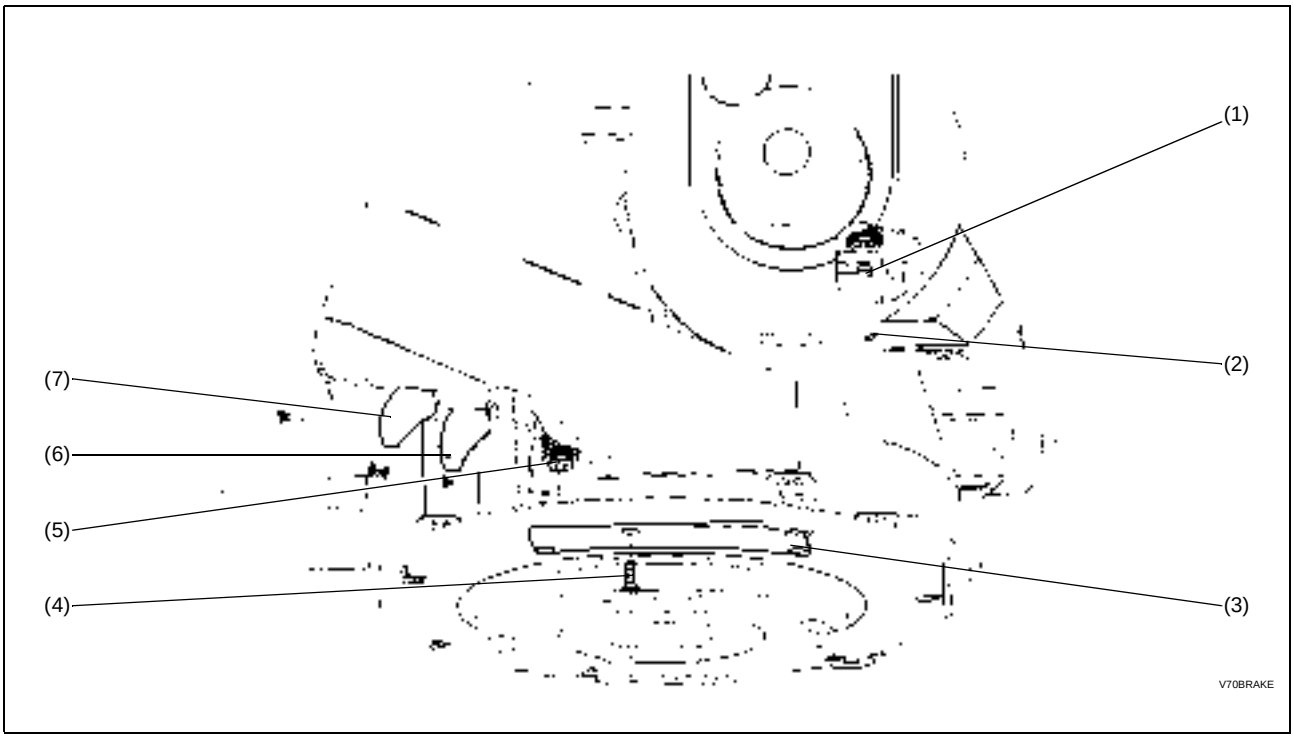


Fig 4.4 Pan and Tilt Brake Adjustment

14.3 On the underside of the head, remove three screws (4) securing cover plate (3).

14.4 Operate the pan brake lever (7) from the OFF to the ON position.

14.5 If brake pressure is not felt after approximately one-third of the lever travel, turn the locating pin (5) clockwise until this is achieved.

14.6 Operate the pan brake lever (7) to the OFF position and ensure that the head is free to rotate.

14.7 Refit cover plate (3) and secure with three screws (4).

Repositioning the wedge adaptor

15 The wedge adaptor is secured by four cap head screws which pass through the wedge adaptor into the sliding plate.

WARNING!: Over-long screws will prevent the sliding plate from operating. Always use the screws provided (M6 x 30mm).

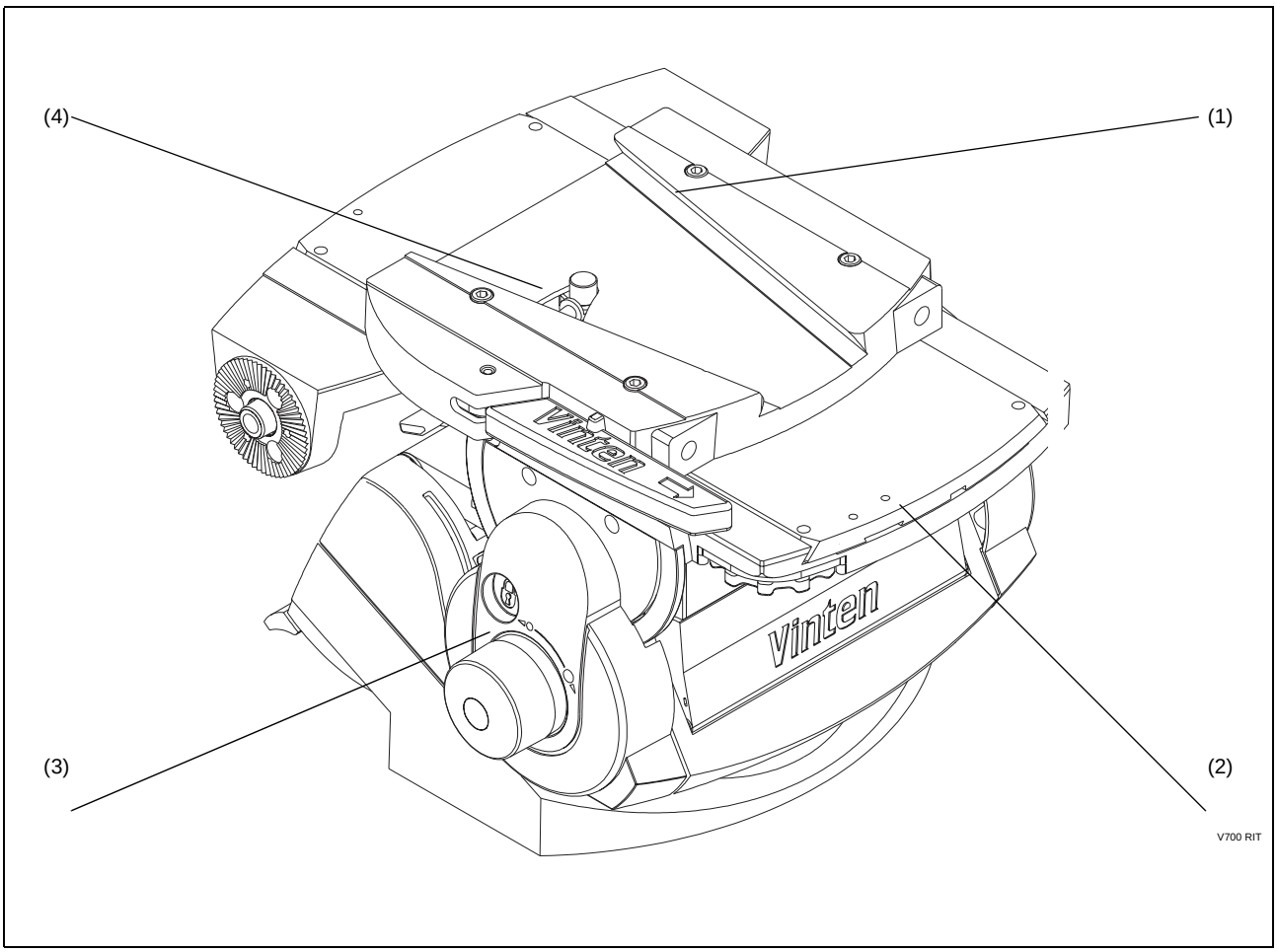


Fig 4.5 Repositioning the wedge adaptor

16 To reposition the wedge adaptor (Fig 4.5):

16.1 Engage the centre lock (3) and remove the load.

16.2 Hold the body of the wedge adaptor (4) and use a 4 mm hexagon wrench to remove four securing screws (1).

16.3 Reposition the wedge adaptor on the sliding plate (2), ensuring that the narrow end of the wedge adaptor faces forwards

16.4 Insert the four screws (1) in the holes in the wedge adaptor and tighten.

Section 5

Repair

Contents **Para**

Contents **Para**

General

1 This section details procedures for disassembly and assembly of the Vector 700 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 alloy. Several of the assembly procedures require the use of special tools and specific sealants, adhesives or lubricants. It is advised that only experienced and properly equipped personnel with access to all necessary tools and materials should attempt to overhaul, repair or replace components on these heads. The tools and consumable materials required for work on Vector 700 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.

Disassembly

Platform Assembly

3 To remove the platform assembly, proceed as follows:

3.1 Remove the payload (if fitted).

3.2 Level the platform.

3.3 Referring to Fig 6.10, release the sliding plate clamp (23). Use the adjustment knob (15) to wind the sliding plate (1) fully backwards.

3.4 Referring to Fig 6.6, remove six screws (1) securing the platform (2) to the two platform pivot blocks (5). Lift of the platform.

3.5 The two Spirol pins (4) will remain in the platform pivot blocks, but may be removed if required.

4 To dismantle the platform assembly, proceed as follows (Fig 6.10):

4.1 Remove two screws (22) securing tilt brake centre (21) and brake disc (tilt) assembly (20) to the platform (28). Pull out two Spirol pins (3).

4.2 Release the sliding plate clamp (24). Using the platform adjustment knob (15), move the platform slide (1) to gain access to each stop screw (7). Remove both stop screws. Turn the adjustment knob until rack (29) disengages from worm drive shaft (6). Slide out the platform slide (1).

4.3 If required, pull out three Spirol pins (30) to release the rack strip (29), which may then be slid out of the platform slide (1).

4.4 Remove slide clamp cover (25). Slacken screw (23) and unscrew slide clamp screw (26). Remove slide clamp (19) and slide clamp lever (24) from platform. Remove screw (23) from slide clamp lever.

4.5 Remove platform adjustment cover (5).

4.6 Remove screw (16) securing platform adjustment knob (15) to pinion (12).

4.7 Remove two screws (14) securing bearing bracket (13) to platform. Remove bearing bracket complete with pinion (12).

4.8 Remove two screws (18) securing shaft support (17) to platform.

4.9 Remove adjustment shaft assy (6) from platform.

4.10 Remove self-adhesive PTFE strip (11) from platform

4.11 Remove buffer (10) from platform. On Vector 700H, remove front stop bung (9) if required.

4.12 Remove three screws (2) securing each serrated disc (4) to platform. Remove three Spirol pins (3) from each location.

Spring-Loaded Flap

5 To remove the spring-loaded flap, proceed as follows (Fig 6.9):

5.1 Hold the flap (6) open and push the pins (4) inwards until the flap pins (2) are clear of the mechanism housing (1).

5.2 Pull the flap clear of the mechanism housing.

6 To dismantle the spring-loaded flap, proceed as follows (Fig 6.9):

NOTE: The flap springs (3, NI) are handed. Note orientation for assembly.

6.1 At each side of the flap, remove Spirol pin (4) to release flap pin (2), spring (5) and flap spring (3, NI).

Tilt brake/balance knob/centre lock

7 Remove the balance knob and associated components as follows (Fig 6.9):

7.1 Carefully prise out the knob bung (29)

7.2 Remove screw (28) and washer (27). Pull off the balance knob (26) and remove drag knob boss (25). Remove the pin (24).

7.3 Remove spring (22) and washer (21) from shaft (23).

8 To remove the tilt cover/centre lock assembly, proceed as follows (Fig 6.9):

8.1 Remove three screws (10) securing the tilt cover/centre lock assembly (30-37) to the tilt back plate (41).

8.2 Pull off the tilt cover/centre lock assembly. Slight tapping of the tilt unit cover (33) may be required.

8.3 Remove 'O' ring (20).

9 To dismantle the tilt cover/centre lock assembly, proceed as follows (Fig 6.9):

9.1 Remove screw (37) to free centre lock release lever spring (36). Remove spring.

9.2 Push out dowel (31) and remove centre lock plunger (30). Remove spring (32) from inside centre lock plunger.

9.3 Lift centre lock release lever (34) off dowel (35).

9.4 Remove dowel (35) and two Spirol pins (12) from tilt unit cover (33) if required.

10 To remove/dismantle the tilt brake assembly, proceed as follows (Fig 6.9):

10.1 Pull out the tilt brake shoe axle (11) to free the tilt brake shoe assembly (39)

10.2 Remove the tilt brake shoe assembly (39) and spring (40).

10.3 Remove the push rod/spring fork assembly (14-19).

NOTE: Do not dismantle the push rod/spring fork assembly (14-19) unless necessary.

10.4 Remove four screws (13) securing tilt back plate (41) to the mechanism housing (1). Remove tilt back plate

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NOTE: The tilt brake bell crank (8), connecting link (43) and associated components are removed with the RH support cap assembly (Para 13).

10.5 If required, scrape the tilt brake reaction lining (45) off the mechanism housing (1), taking care not to damage the surface of the casting. Clean the mating face on the mechanism housing.

10.6 Remove two Spirol pins (12) and two grubscrews (42) from tilt back plate (41) if required.

Tilt drag assembly

WARNING!: The tilt drag assembly is an hermetically sealed unit. Do not attempt to dismantle the assembly beyond the level detailed below.

NOTE: An extended 3 mm AF spherical-ended hex wrench (Vinten Part No. 3354-931TL) is required to remove the tilt drag assembly.

11 To remove the tilt drag assembly (Fig 6.6):

11.1 Remove two screws (11) and three screws (19) securing the tilt drag assembly (25) to the mechanism housing (10).

11.2 At the LH actuator (32), slacken screw (30).

11.3 Pull off the tilt drag assembly. Slight tapping of the tilt drag assembly may be required.

12 Limited dismantling of the tilt drag assembly is permissible. Proceed as follows (Fig 6.6):

12.1 Carefully prise out the knob bung (47).

12.2 Remove screw (46) and washer (45). Pull off the drag knob (44). Remove two balls (48) and springs (49). If required, pull out drag detent ring (43).

12.3 If required, remove snap ring (27) and pull off bearing (26).

12.4 If required, remove two dowel pins (28).

Balance mechanism

13 To remove/dismantle the balance mechanism, proceed as follows (Fig 6.6):

13.1 Remove the platform (Para 3), spring-loaded flap (Para 5), tilt brake/balance knob/centre lock (Para 7) and tilt drag assembly (Para 11).

13.2 Referring to Fig 6.3, remove all base cover plates as follows:

13.2.1 Remove three screws (6) securing RH cover plate (7).

13.2.2 Remove three screws (6) securing LH cover plate (14). Disconnect and remove the battery.

13.2.3 Remove four screws (6) securing brake lever guide assy (5) and brake lever cover plate (4).

13.2.4 Remove two screws (6) securing switch cover plate (8). Remove screw (12) securing PCB to base and carefully remove switch cover plate, PCB and battery connector. Note the position of the LED and carefully manipulate it from its location

13.3 Referring to Fig 6.6, on the vertical track member (7), slacken the two top grubscrews (8) and pull out the two top pins (29). An M3 screw may be installed in the pins to assist in removal. Note the position of and retain all shims (18).

13.4 On the mechanism housing (10), slacken the two top grubscrews (8) and pull out the two pins (9). An M3 screw may be installed in the pins to assist in removal. Note the position of and retain all shims (18).

13.5 Remove the two platform pivot blocks (5). If required, the plain bearings (6) may be removed by slackening screws (3).

13.6 At the LH and RH actuators (32, 40), slacken screws (30).

13.7 Pull the bevel pinion shaft (35) sharply outwards to unseat the RH actuator shaft (34) and bearing (12).

13.8 At the bevel pinion (39) unscrew the two grubscrews (38) until the shaft (35) can be pulled out of the mechanism housing.

13.9 Remove the RH actuator shaft (34), complete with bearing (12), two snap rings (36) and flanged bush (37). Dismantle as required.

13.10 Lift out the vertical track member (7) together with the LH and RH actuators (32, 40). To remove the actuators, slacken the two bottom grubscrews (8) and pull out the two bottom pins (29). An M3 screw may be installed in the pins to assist in removal. Note the position of and retain all shims (18).

13.11 If required, the plain bearings (6) may be removed from the actuators (32, 40) by slackening screws (30).

13.12 Pull the adjuster assembly (14) and two shims (13) out of the mechanism housing. Recover bevel pinion (39) if not already removed.

NOTE: An extended 4 mm AF spherical-ended hex wrench (Vinten Part No. 3354-931TL) is required to remove the support caps

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13.13 Referring to Fig 6.3, remove three screws (1, 15, 16) securing LH support cap (18 or 20) to base (17).

13.14 Referring to Fig 6.5, remove three screws (26, 27, 29) securing RH support cap (1) to base (28).

13.15 Lift the mechanism housing and support caps off the base, manipulating brake mechanism through base aperture.

13.16 Pull the LH and RH support caps off the linkage. Note the position of and retain any shims (item 39, Fig 6.6). The bushes (item 19, Fig 6.3 and item 25, Fig 6.5) are a push fit in the support caps.

13.17 Referring to Fig 6.6, carefully support the upper drive arm (15) and drive in two horizontal track arm pins (16), taking care not to damage the bearings in the horizontal track arm (17).

13.18 On the mechanism housing, release two grubscrews (8) securing upper arm pivot pins (22). Pull out the two pins. An M3 screw may be installed in the pins to assist in removal. Remove the upper drive arm (15). Note the position of and retain all shims (18).

13.19 On the mechanism housing, pull out the two lower arm pivot pins (29). An M3 screw may be installed in the pins to assist in removal. Retain all shims (18).

13.20 The lower drive arm and the horizontal track arm (21, 17) are now freed from the mechanism housing. To separate these components, support them carefully and drive in two horizontal track arm pins (16), taking care not to damage the bearings in the horizontal track arm (17). Note the position of and retain all shims (18).

13.21 In the mechanism housing, remove bearings (12) from central hubs if required. Remove rear tilt buffer (20) if required.

Balance adjuster assembly (Vector 700)

NOTE: The balance adjuster was improved at Serial No. 785. The earlier balance adjuster (3354-14) should be replaced with the redesigned balance adjuster (3554-54).

14 To dismantle the balance adjuster assembly, proceed as follows (Fig 6.7)

14.1 Remove Spirol pin (15) securing bevel gear (14) to adjuster shaft (11). Slacken grubscrew (8) and pull gear off shaft.

14.2 Remove ‘E’ clip (12) from shaft.

14.3 Pull bush (13) out of housing (7) if required.

14.4 Turn adjuster shaft (11) to position carriage (9) in mid position. Manipulate shaft and carriage out of housing (7).

14.5 Unscrew adjuster shaft (11) from carriage (9). To remove track rollers (1), shims (2), track wiper mouldings (3) and track wiper outers (4) from carriage, undo grub screws (8) and pull out roller axles (5, 10). Note orientation of roller axles. Separate track wiper mouldings (3) and track wiper outers (4) if required.

14.6 Drive out lift-off stop pin (16) if required.

14.7 Pull out the bearings (6) if required.

Balance adjuster assembly (Vector 700H)

NOTE: The balance adjuster was improved at Serial No. 785. The earlier balance adjuster (3354-44) should be replaced with the redesigned balance adjuster (3554-55).

15 To dismantle the balance adjuster assembly, proceed as follows (Fig 6.8)

15.1 Remove Spirol pin (16) securing bevel gear (15) to adjuster shaft (11). Slacken grubscrew (8) and pull gear off shaft.

15.2 Remove ‘E’ clip (13) from shaft.

15.3 Pull bush (14) out of housing (7) if required.

15.4 Turn adjuster shaft (11) to position carriage (9) in mid position. Manipulate shaft and carriage out of housing (7).

15.5 Unscrew adjuster shaft (11) from carriage (9). To remove track rollers (1), shims (2), track wiper mouldings (3) and track wiper outers (4) from carriage, undo grub screws (8) and pull out roller axles (5, 10 and 12). Note orientation of roller axles. Separate track wiper mouldings (3) and track wiper outers (4) if required.

15.6 Drive out lift-off stop pin (17) if required.

15.7 Pull out the bearings (6) if required.

RH support cap assembly

16 To dismantle the RH support cap assembly, proceed as follows (Fig 6.5):

16.1 Unscrew stud (8) from pan brake fork end (6) to free spring assembly (8-14).

NOTE: Do not dismantle the spring assembly (8-14) unless necessary. A special tool is required for assembly.

16.2 Remove pan brake rocker arm (7) from pivot in support cap (1).

16.3 Slacken grubscrew (24) and push out link arm pivot pin (20).

16.4 Withdraw brake lever pivot pin (21). An M2.5 screw may be installed in the pin to assist in removal.

16.5 Remove all components from inside the support cap. Note the position of and retain all shims (15).

16.6 Note orientation and remove self-locking ring (3) and pin (4) to separate pan brake link arm (5) and pan brake fork end (6).

16.7 Remove pin (17) from tilt brake link arm (18) to free connecting link (22) if required.

16.8 Referring to Fig 6.9, remove self-locking ring (9) and headed pin (44) to separate connecting link (43) and tilt brake bell crank (8). If required, pull out tilt brake pivot pin (7).

Pan drag/brake mechanism

17 To remove the pan drag/brake mechanism, proceed as follows (Fig 6.4):

17.1 Carefully prise out the knob bung (33)

17.2 Remove screw (32) and washer (31). Pull off the drag knob (34) and remove drag knob boss (30).

17.3 Remove pin (29) securing drag detent ring (36) on shaft (35). Remove drag detent ring and two balls (38) and springs (39).

17.4 Remove three screws (28) securing pan drag adjustment disc (40) to base (1). Remove disc, washer (41) assembled shaft and bevel gear and shim (45).

17.5 If required, remove circlip (42) from shaft (35) and pull bevel gear (44) from shaft (35). The bevel gear is secured to the shaft with Loctite 638.

17.6 Remove pan bearing nut (47) and pull out two dowels (46). An M3 screw may be installed in the dowels to assist in removal.

17.7 Note orientation and remove four screws (23) and three screws (24) securing brake reaction plate (22) to base (1).

17.8 Pull off the brake reaction plate and remove the assembled pan drag/brake mechanism from the base.

WARNING!: The pan drag assembly is an hermetically sealed unit. Do not attempt to dismantle the pan drag/brake mechanism beyond the level detailed below.

18 To dismantle the pan drag/brake mechanism, proceed as follows (Fig 6.4):

18.1 Remove eight screws (25) securing pan brake disc (19) and brake disc clamp ring (26) to four-hole mounting plate (20) and pan drag unit assembly (17). Drive out two Spirol pins (18).

18.2 Remove eight screws (21) securing pan drag unit assembly (17) in mounting plate (20).

18.3 Remove thrust race (27) and upper thrust bearing race disc (16) from pan sub-plate assembly (9).

18.4 Remove circlip (5) and ‘V’ ring (6) from brake plunger. Remove and discard 'O' ring (4) from the boss in the pan sub-plate (9). Remove self-locking ring (7) and spring (8) from each pillar of the brake shoe assembly (15) and remove brake shoe assembly from the pan sub-plate (9).

18.5 Remove two circlips (3), gear strap (12) and gear strap shims (13). Pull off the idler gear (10), bevel gear assembly (14) and bevel gear shims (11).

Assembly

NOTE: All ‘O’ rings, seals and spring clips removed during disassembly should be renewed.

Pan drag/brake mechanism

19 To assemble and install the pan drag/brake mechanism, proceed as follows (Fig 6.4):

NOTE: Ensure grease does not contaminate brake surface of brake shoe assembly (15).

19.1 Sparingly lubricate the shaft and pillars of brake shoe assembly (15) with LM grease and install in the sub-plate (9). Install a spring (8) and self-locking ring (7) on each pillar of the brake shoe assembly. Install ‘O’ ring (4) over the boss in the sub-plate (9). Install ‘V’ ring (6) and circlip (5) on brake plunger, ensuring ‘V’ ring is correctly oriented.

19.2 Sparingly lubricate the gear pillars of the sub-plate (9) and the running faces of shims (11), the bevel gear assembly (14), the idler gear (10) and gear strap shims (13) with LM grease.

19.3 Install shim (11) and the bevel gear assembly (14) on the left-hand pillar of the sub-plate (9).

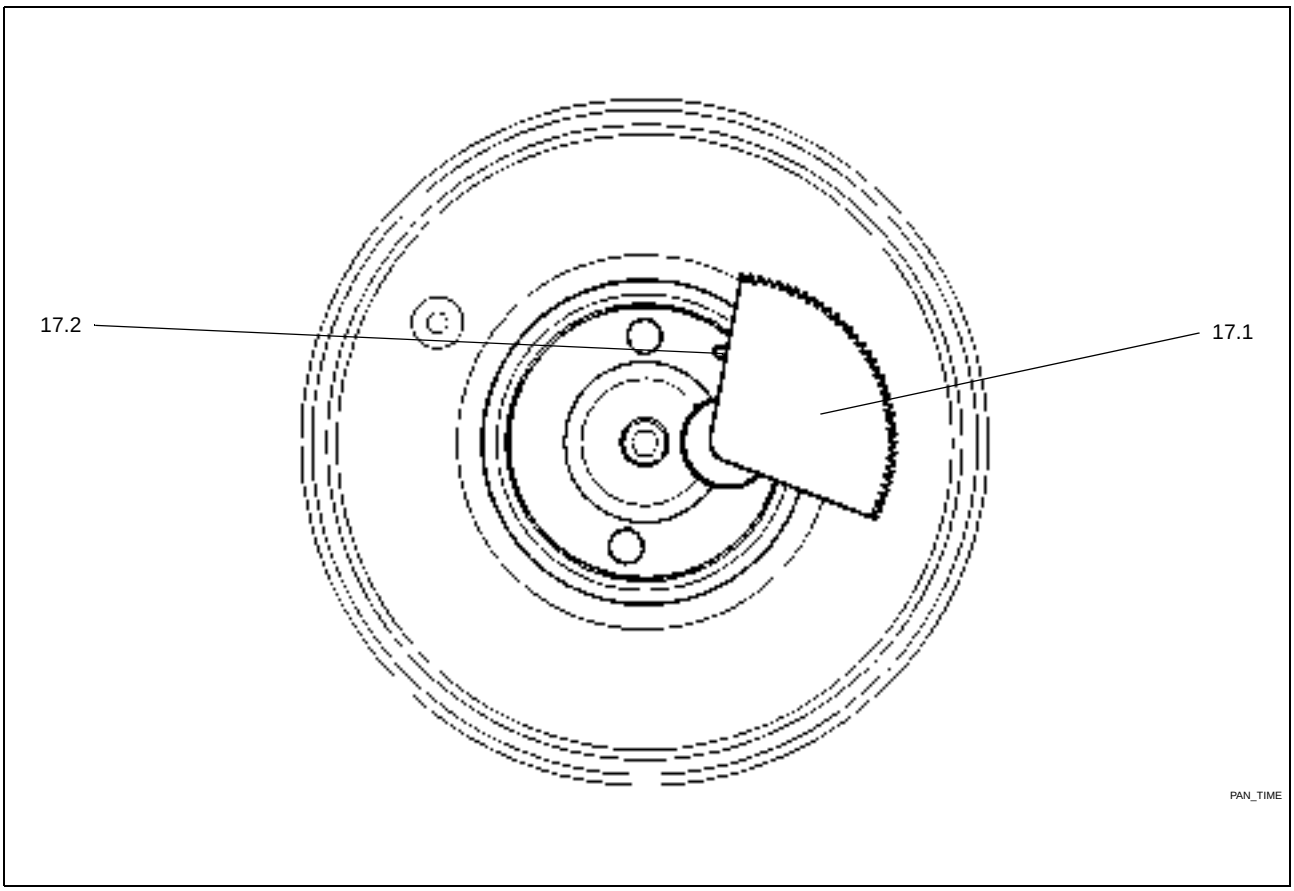

Fig 5.1 Pan Drag Timing Mark

19.4 Install the idler gear (10) on the right-hand pillar of the sub-plate (9), ensuring it meshes correctly with the bevel gear.

19.5 Install two gear strap shims (13) and the gear strap (12) and secure with two circlips (3). Check end-float on gears and add or remove shims (13) as necessary.

19.6 Position pan brake disc (19) on the mounting plate (20), ensuring lapped side is uppermost. Install the brake disc clamp ring (26) and secure loosely with eight screws (25).

19.7 Install two pins (18) in the brake disc clamp ring (26), ensuring pins are underflush with top face of clamp ring.

19.8 Install the pan drag unit assembly (17) in the mounting plate and centralise the brake disc. Tighten eight screws (25).

19.9 Secure the pan drag unit assembly (17) in the mounting plate with eight screws (21).

19.10 Referring to Fig 5.1, ensure that the pan drag actuator gear (17.1) is in the maximum drag position, with the leading edge of the gear adjacent to the timing mark (17.2).

NOTE: To facilitate installation of the pan drag mechanism, two long M6 bolts may be passed down through the dowel holes in the base housing (1).

19.11 Position the base housing (1) upside-down on the bench and install the assembled pan sub-plate, ensuring pan drag cut-out aligns with base knob boss, holes align with holes in base and the ‘O’ ring (4) on brake boss locates correctly in base.

19.12 Lightly lubricate thrust race (27) and thrust race upper bearing disc (16) with LM grease.

NOTE: Do not allow grease to contaminate the braking surfaces of the brake disc (19).

19.13 Position thrust race on assembled pan drag mechanism and thrust race upper bearing disc on pan sub-plate.

19.14 Position brake reaction plate (22) over four-hole mounting plate (20) and align holes in reaction plate with those in drag plate subassembly.

19.15 Lower the assembled pan drag/brake mechanism into the base, ensuring that the pan drag actuator gear (Item 17.1, Fig 5.1) engages cleanly with the idler gear (10).

19.16 Install the pan brake reaction assembly (22) and secure with four 25 mm long screws (23) and three 20 mm screws (24) noting that longer screws are installed to the rear of the base.

19.17 Install the pan bearing nut (47) and tighten to remove any play in the bearing.

19.18 Lightly grease two dowels (46) and install in the base (1), ensuring dowels are flush.

19.19 If removed, install pin (43) and bevel gear (44) on drag knob shaft (35) and secure with Loctite 638.

19.20 If removed, push dowel (37) into pan drag adjustment disc (40) so that dowel projects 4.25 mm.

19.21 Install circlip (42) and washer (41) on drag knob shaft (35). Pass shaft through pan drag adjustment disc (40) and install dowel (29) temporarily.

19.22 Lightly lubricate bevel gear shim (45) and contact faces of bevel gear and drag knob shaft with LM grease. Install bevel gear shim on drag knob shaft

19.23 With the dowel (29) horizontal and dowel (37) in the pan drag adjustment disc facing forwards, position assembled pan drag knob shaft in base, ensuring end of shaft locates correctly. Secure lightly with three screws (28).

19.24 Position drag knob boss (30) on shaft (35), then fit drag knob (34) so that ‘9’ on knob is adjacent to mark on base casting. Turn the knob counter-clockwise to ‘0’, then adjust position of pan drag adjustment disc (40) so that the stop prevents further counter-clockwise movement. Remove the drag knob and fully tighten screws (28).

19.25 Refit the drag knob and ensure that full travel from ‘0’ to ‘9’ is possible and that full drag is applied at ‘9’. Re-adjust the pan drag adjustment disc (40) as required.

19.26 Remove the drag knob, drag knob boss and dowel (29).

19.27 Lightly lubricate two springs (39) and two steel balls (38) with LM grease and install in the pan drag adjustment disc (40). Install drag detent ring (36) and secure with dowel (29).

19.28 Install knob boss (30) on shaft, engaging slot with dowel (29). With drag set to minimum, fit drag knob (34) over boss so that ‘0’ on knob is adjacent to mark on base casting. Secure knob with washer (31) and screw (32). Install bung (33).

Balance adjuster assembly (Vector 700)

NOTE: The balance adjuster was improved at Serial No. 785. The earlier balance adjuster (3354-14) should be replaced with the redesigned balance adjuster (3554-54).

20 To assemble the balance adjuster assembly, proceed as follows (Fig 6.7):

20.1 Using Easyrun 50 grease, lubricate track rollers (1), shims (2) thread of adjuster shaft (11) and running surfaces of housing (7) and carriage (9).

NOTE: If bevel gear (14) or adjuster shaft (11) require replacement, both items must be replaced and drilled to accept pin (15).

20.2 If removed, fit lift-off stop pin (16) in housing (7) using Loctite 601. Ensure pin is correctly oriented.

20.3 If removed, install two bearing (6) in housing (7), ensuring bearings are correctly seated and secure with Loctite 641.

20.4 Assemble four track wiper mouldings (3) in four track wiper outers (4). Slide each assembly onto a track roller (1).

20.5 Position a shim (2) on each side of two track rollers/wipers and install in the housing (7), ensuring wiper blades face outwards. Install two 18 mm. roller axles (5), ensuring ends of axles are slightly under-flush with the sides of the housing. Apply Loctite 222E to threads of two grubscrews (8) and secure each axle.

20.6 Position a shim (2) on each side of two track rollers/wipers and install in the carriage (9), ensuring wiper blades face downwards. Install a 15 mm. roller axle (10) on side of carriage adjacent to lift-off stop pin (15) and a 18 mm. roller axle (5) on side of carriage opposite to lift-off stop pin. Ensure roller axle (5) protrudes 4.5 mm. (Fig 6.7). Apply Loctite 222E to threads of two grubscrews (8) and secure each axle.

20.7 Screw the adjuster shaft (11) into the carriage (9) to the mid position. Position the assembly in the housing (7), locating the end of the adjuster shaft in the end bracket on the housing.

20.8 If removed, push the bush (13) into the housing.

20.9 Install the ‘E’ clip (12) on the adjuster shaft (11).

20.10 Install the bevel gear (14) on the adjuster shaft (11) and secure with Spirol pin (15). Tighten grubscrew (8). If a new bevel gear is being installed, proceed as follows:

20.10.1 Install the bevel gear (14) on the adjuster shaft (11). Push the bevel gear onto the shaft to take up end float and tighten the grubscrew (8).

20.10.2 Using a 4 mm. dia drill in the pilot hole provided, drill through the boss of the bevel gear and the shaft.

20.10.3 Install Spirol pin (15).

Balance adjuster assembly (Vector 700H)

NOTE: The balance adjuster was improved at Serial No. 785. The earlier balance adjuster (3354-14) should be replaced with the redesigned balance adjuster (3554-54).

21 To assemble the balance adjuster assembly, proceed as follows (Fig 6.8):

21.1 Using Easyrun 50 grease, lubricate track rollers (1), shims (2) thread of adjuster shaft (11) and running surfaces of housing (7) and carriage (9).

NOTE: If bevel gear (15) or adjuster shaft (11) require replacement, both items must be replaced and drilled to accept pin (16).

21.2 If removed, fit lift-off stop pin (17) in housing (7) using Loctite 601. Ensure pin is correctly oriented.

21.3 If removed, install two bearing (6) in housing (7), ensuring bearings are correctly seated and secure with Loctite 641.

21.4 Assemble four track wiper mouldings (3) in four track wiper outers (4). Slide each assembly onto a track roller (1).

21.5 Position a shim (2) on each side of two track rollers/wipers and install in the housing (7), ensuring wiper blades face outwards. Install two 27 mm. roller axles (5), ensuring ends of axles are slightly under-flush with the sides of the housing. Apply Loctite 222E to threads of two grubscrews (8) and secure each axle.

21.6 Position a shim (2) on each side of two track rollers/wipers and install in the carriage (9), ensuring wiper blades face downwards. Install a 15 mm. roller axle (10) on side of carriage adjacent to lift-off stop pin (15) and a 18 mm. roller axle (12) on side of carriage opposite to lift-off stop pin. Ensure roller axle (12) protrudes 4.5 mm (Fig 6.8). Apply Loctite 222E to threads of two grubscrews (8) and secure each axle.

21.7 Screw the adjuster shaft (11) into the carriage (9) to the mid position. Position the assembly in the housing (7), locating the end of the adjuster shaft in the end bracket on the housing.

21.8 If removed, push the bush (14) into the housing.

21.9 Install the ‘E’ clip (13) on the adjuster shaft (11).

21.10 Install the bevel gear (15) on the adjuster shaft (11) and secure with Spirol pin (16). Tighten grubscrew (8). If a new bevel gear is being installed, proceed as follows:

21.10.1 Install the bevel gear (15) on the adjuster shaft (11). Push the bevel gear onto the shaft to take up end float and tighten the grubscrew (8).

21.10.2 Using a 4 mm. dia drill in the pilot hole provided, drill through the boss of the bevel gear and the shaft.

21.10.3 Install Spirol pin (16).

Balance mechanism and support caps

22 To assemble the balance mechanism, proceed as follows (Fig 6.6):

NOTE: Shim (18) is available in two thicknesses - 0.005 in. (3354-206) and 0.003 in. (3354-299). Shim (39) is available in three thicknesses - 0.005 in. (3354-209), 0.003 in. (3354-217) and 0.002 in. (3354-433). Combinations of shims should be used as required, ensuring that components are shimmed equally on each side.
All shims (except adjuster unit shim (13)), bearings, bushes and pivot pins should be lightly lubricated with LM grease prior to assembly.

22.1 If bearings (12) were removed from mechanism housing (10), install centrally and secure with Loctite 641.

22.2 If rear tilt buffer (20) was removed from mechanism housing (10), install using Loctite 415.

22.3 Referring to Fig 5.2, calculate the shims required between the upper drive arm (15) and the horizontal track arm (17) as follows:

22.3.1 Measure the width across the upper bearing faces of the horizontal track arm - dimension A

22.3.2 Measure the distance between the bearing faces of the upper drive arm - dimension B

22.3.3 Subtract A from B, divide by 2 and, using shims (18), assemble two shim packs to this figure, allowing not more than 0.002 in. clearance.

22.4 Position the horizontal track arm (17) and two shim packs in the upper drive arm (15). Install two horizontal track arm pivot pins (16) from the inside, ensuring bearings are not damaged and pins are underflush with the upper drive arm.

22.5 Referring to Fig 5.2, calculate the shims required between the upper drive arm (15) and the mechanism housing (10) as follows:

22.5.1 Measure the width across the upper bearing faces of the mechanism housing - dimension C.

22.5.2 Measure the distance between the bearing faces of the upper drive arm - dimension D.

22.5.3 Subtract C from D, divide by 2 and, using shims (18), assemble two shim packs to this figure, allowing not more than 0.002 in. clearance.

22.6 Position the upper drive arm/horizontal track arm in the mechanism housing with the shim packs between the inside bearing faces and one 0.005 in. shim (18) between each outside bearing face. Install two upper arm pivot pins (22), ensuring pins are underflush with the faces of the mechanism housing. Secure pins with grubscrews (8).

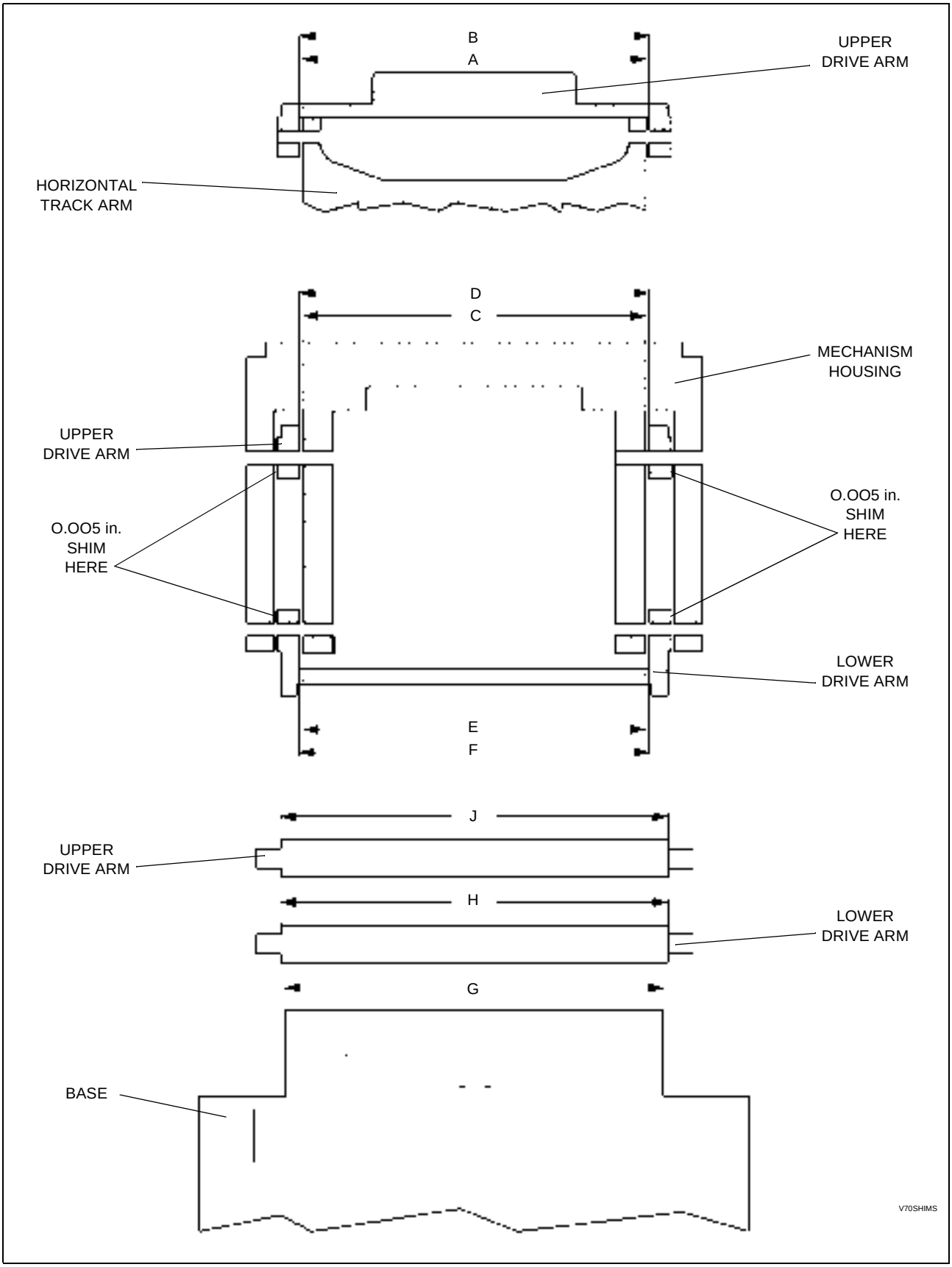

Fig 5.2 Balance Mechanism Shims

22.7 Referring to Fig 5.2, calculate the shims required between the lower drive arm (21) and the mechanism housing (10) as follows:

22.7.1 Measure the width across the lower bearing faces of the mechanism housing - dimension E.

22.7.2 Measure the distance between the bearing faces of the lower drive arm - dimension F.

22.7.3 Subtract E from F, divide by 2 and, using shims (18), assemble two shim packs to this figure, allowing not more than 0.002 in. clearance.

22.8 Position the lower drive arm in the mechanism housing with the shim packs between the inside bearing faces and one 0.005 in. shim (18) between each outside bearing face. Install two lower arm pivot pins (27) from the outside, ensuring bearings are not damaged and pins are underflush with the faces of the mechanism housing.

22.9 Align the lower end of the horizontal track arm (17) in the lower drive arm (21), install a 0.005 in. shim (18) at each side and install two horizontal track arm pivot pins (16) from the inside, ensuring pins are underflush with the lower drive arm.

22.10 In the mechanism housing, lubricate the inside faces of bearings (12) with Easyrun 50 grease.

22.11 On the adjuster assembly (14), lubricate the outside faces of bearings with Easyrun 50 grease.

22.12 In the mechanism housing, position a shim (13) on the inside faces of bearings (12) and install the adjuster assembly, aligning the holes in the bearings and shims.

22.13 If removed, install a bearing (6) in RH actuator (40) and LH actuator (32). Centralize the bearing and position the slot in the bearings diametrically opposite to the slot in the actuators. Secure lightly with screw (30).

NOTE: Actuators (32, 40) are handed. Ensure RH actuator (40), with round hole, is installed at RH end of vertical track member (7) and LH actuator (32), with pear-shaped hole, at LH end.

22.14 Position RH actuator (40) in lower RH end of vertical track member (7), with a 0.005 in. shim (18) on each side. Install pivot pin (29) and secure with grubscrew (8).

22.15 Position LH actuator (32) in lower LH end of vertical track member (7), with a 0.005 in. shim (18) on each side. Install pivot pin (29) and secure with grubscrew (8).

NOTE: Final adjustment of bearings is carried out after assembly of the head.

22.16 At each actuator, tighten screw (30) until all slack in the bearing is eliminated but actuator moves freely on its pivot. Actuator should just fall from the horizontal position under its own weight.

22.17 Position the assembled vertical track member and actuators in the mechanism housing so that the lift off stop pin (item 16, Fig 6.7 or item 16, Fig 6.8) engages in the slot behind the RH vertical track. Align holes in actuators with holes in bearings (12).

22.18 Install flanged bush (37) in RH actuator shaft (34). Install two snap rings (36) and bearing (12) on RH actuator shaft.

22.19 Install RH actuator shaft in mechanism housing, passing shaft through RH actuator (40), bearings (12) and shim (13), Do not push the shaft fully home.

22.20 Position bevel pinion (39) in adjuster assembly. Push bevel pinion shaft (35) through RH actuator shaft and into bevel pinion. Secure bevel pinion with two grubscrews (38), which engage in dimples in bevel pinion shaft (35).

22.21 Push the RH actuator shaft fully home in the mechanism housing.

22.22 If removed, adhere the tilt brake reaction lining (33) to the mechanism housing (10) using Loctite 380.

22.23 If removed, install two bearings (6) in each platform pivot block (5). Centralize the bearings and position the slots in the bearings diametrically opposite to the slots in the pivot blocks. Secure lightly with screws (3).

NOTE: Final adjustment of bearings is carried out after assembly of the head.

22.24 At the front bearing of each platform pivot block (5), install a pivot pin (29) and tighten screw (3) until all slack in the bearing is eliminated but pivot block moves freely on its pivot pin. Pivot block should just fall from the horizontal position under its own weight. Remove pivot pins (29).

22.25 On the tilt brake side pivot block (5), position a 0.005 in. shim (18) on the outside and sufficient shims (18) on the inside to take out side play and install the pivot block (5) in the mechanism housing (10). Install pivot pin (9) slightly underflush and secure with grubscrew (8). At the platform pivot block, tighten screw (3) until all slack in the bearing is eliminated but pivot block moves freely on its pivot pin. Pivot block should just fall from the horizontal position under its own weight.

22.26 Install and adjust the tilt drag side pivot block (5) in the mechanism housing in a similar manner, but do not fit any shims (18).

22.27 On the tilt brake side pivot block (5), position a 0.005 in. shim (18) on the outside and sufficient shims (18) on the inside to take out side play and install the pivot block (5) in the vertical track member (7). Install pivot pin (27) slightly underflush and secure with grubscrew (8).

22.28 Install the tilt drag side pivot block (5) in the vertical track member in a similar manner, but do not fit any shims (18).

22.29 Ensure RH actuator (40) is central in mechanism housing and fully tighten screw (30),

23 To assemble the RH support cap assembly, proceed as follows (Fig 6.5):

NOTE: Lubricate all shims, pins and other moving parts of the support caps with Chesterton grease.

23.1 If removed, install two bushes (25) in support cap (1).

23.2 If dismantled, assemble the spring assembly (8-14) as follows:

23.2.1 Secure stud (8) in locating pin (14) using Loctite 270. Adjust to length shown in Fig 6.5.

23.2.2 On the locating pin (14) arrange 20 disc springs (13) as shown in Fig 6.5.

23.2.3 Install washer (12) and washer (11) and secure with nut (10),

23.2.4 Install cap (9).

23.3 Position pan brake lever (16) and tilt brake lever (19) in support cap (1) and install brake lever pivot pin (21).

23.4 Referring to Fig 6.9, connect tilt brake bell crank (8) and connecting link (43) using pin (44). Secure with self-locking ring (9).

23.5 Referring to Fig 6.5, pass connecting link (22) through slot in support cap (1) and between brake levers (16, 19).

23.6 Position tilt brake link arm (18) on connecting link (22) and install pin (17).

NOTE: Self locking ring (3) is installed inside the pan brake fork end (6), on the outside of the pan brake link arm (5).

23.7 Position pan brake fork end (6) on pan brake link arm (5). Install pin (4) and secure with self-locking ring (3).

23.8 Position assembled pan brake link arm in support cap (1). Install shims (15) between each of the components in the support cap, align all pivot holes and slots and install link arm pivot pin (20), noting orientation. Secure with grubscrew (24).

NOTE: The pan brake push rod (2) is longer than the tilt brake push rod (23).

23.9 Install the pan brake push rod (2) between the cup on the pan brake link arm (5) and the cup on the pan brake lever (16).

23.10 Install the tilt brake push rod (23) between the cup on the tilt brake link arm (18) and the cup on the tilt brake lever (19).

23.11 Position the pan brake rocker arm (7) in the support cap pivot (1). Apply Loctite 222E to the threaded stud of the spring assembly (8) and pass it through the rocker arm and screw it into the pan brake fork end (6).

NOTE: Final adjustment of the pan brake spring assembly is carried out after assembly of the head.

23.12 Check moving parts for freedom and fit. Add or remove shims (15) as required.

24 To assemble the LH support cap, proceed as follows (Fig 6.3):

24.1 install two bushes (19) in LH support cap (18 or 20).

25 Install the balance mechanism and end caps as follows:

25.1 Referring to Fig 5.2 and Fig 6.6, calculate the shims required between the upper and lower drive arms and the two support caps as follows:

25.1.1 Measure the width across the support cap bearing faces on the base - dimension G.

25.1.2 Measure the distance between the bearing faces of the lower drive arm - dimension H.

25.1.3 Measure the distance between the bearing faces of the upper drive arm - dimension J.

25.1.4 Subtract G from H, divide by 2 and, using shims (39), assemble two shim packs to this figure for the lower drive arm, allowing not more than 0.002 in. clearance.

25.1.5 Subtract G from J, divide by 2 and, using shims (39), assemble two shim packs to this figure for the upper drive arm, allowing not more than 0.002 in. clearance.

25.2 Position LH and RH support caps on the balance mechanism, ensuring correct shims are installed on drive arm pins.

NOTE: An extended 4 mm AF spherical-ended hex wrench (Vinten Part No. 3354-931TL) is required to install the support caps.

25.3 Referring to Fig 6.3, secure LH support cap (18 or 20) to base (17) with three screws (1, 15 and 16) using Loctite 222E. Ensure correct length screws are used in appropriate positions. Tighten the vertical screws (15, 16) until just gripping, tighten the horizontal screw (1) fully, then tighten the vertical screws fully.

25.4 Referring to Fig 6.5, secure RH support cap (1) to base (28) with three screws (26, 27 and 29) using Loctite 222E. Ensure correct length screws are used in appropriate positions. Tighten the vertical screws (26, 27) until just gripping, tighten the horizontal screw (29) fully, then tighten the vertical screws fully.

25.5 Ensure tilt brake is released, then operate balance mechanism through its range. Check for freedom of movement, knocks or other irregularities.

Platform assembly

26 To assemble the platform, proceed as follows (Fig 6.10):

26.1 Slide the rack strip (29) into the slide plate (1) and secure with three Spirol pins (30).

26.2 Install two serrated discs (4) on the platform (28) and secure each with three screws (2) and three spirol pins (3).

26.3 Affix the self-adhesive PTFE strip (11) to the platform.

26.4 Secure the front stop bung (9) (Vector 700H only) to the platform using Permabond ESP 110, ensuring flat face faces forwards

26.5 Secure the platform buffer (10) to the platform (or front stop bung (9)) using Loctite 415, ensuring flat face faces forwards.

26.6 Lubricate the adjustment shaft assy worm (6), platform adjustment pinion (12) and both bearings on adjustment shaft assy shaft (6) with LM grease.

26.7 Install platform adjustment pinion (12) in bearing bracket (13). Fit bearing bracket to adjustment shaft assy (6) and position on platform. Secure bracket lightly with two screws (14).

26.8 Install shaft support (17) on adjustment shaft assy (6) and secure lightly to platform with two screws (18). Position shaft support to remove end float on adjustment shaft assy and tighten two screws (18).

26.9 Install platform adjustment knob (15) and secure with screw (16). Turn knob and ensure mechanism operates freely. Remove screw (16) and knob (15) and fully tighten two screws (14). Replace knob (15) and secure with screw (16) using Loctite 222E.

26.10 Affix the self-adhesive platform adjustment cover (5) to the platform.

26.11 Install two brake disc Spirol pins (3) in platform (28), so that pins protrude 5 mm

26.12 Pass two screws (22) through tilt brake centre (21) and brake disc (tilt) assembly (20). Install on Spirol pins (3) and secure with two screws (22).

26.13 Loosely install screw (23) in slide clamp lever (24) Position lever in platform and screw in slide clamp screw (26) until it engages with lever. Position slide clamp (19) in platform and fully screw in slide clamp screw (26).

NOTE: The slide plate is installed after the platform is attached to the head.

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27 To install the platform assembly, proceed as follows (Fig 6.6):

27.1 If removed, install a Spirol pin (4) in each platform pivot block (5).

NOTE: Ensure the mechanism housing is level prior to installation of the platform.

27.2 Position the platform (2) over the pivot blocks and fully engage. Ensure pins (4) do not protrude above the surface. Secure the platform to the pivot blocks with six screws (1).

27.3 Referring to Fig 6.10, slide the slide plate (1) into the platform and engage with the worm gear. Using the platform adjustment knob (14), position the platform so that the two stop screws (7) can be installed.

27.4 Adjust the slide clamp as follows:

27.4.1 Pull the slide clamp lever (24) fully upwards.

27.4.2 Slacken the clamp screw (23)

27.4.3 Using a torque screwdriver, turn the slotted shaft (26) fully clockwise to a torque of 4.0 Nm (35 lbf in.).

27.4.4 Tighten the clamp screw (23).

27.4.5 Move the lever over its full range and ensure that, in the clamped position, it prevents the slide from being moved, while in the released position it allows free adjustment of the slide. Re-adjust if necessary.

27.5 Affix the self-adhesive slide clamp cover (24) to the platform.

Tilt brake

28 To assemble the tilt brake components, proceed as follows (Fig 6.9):

28.1 If the push rod/spring fork assembly was dismantled, assemble as follows:

28.1.1 On the pin (18) arrange 19 disc springs (17) as shown in Fig 6.9.

28.1.2 Open the fork (14) sufficiently to install pin and springs.

28.1.3 Secure pin with washer (16) and screw (15), using Loctite 222E.

28.1.4 Install grubscrew (19), using Loctite 222E and adjust assembly to dimension shown in Fig 6.9.

28.2 If removed, install two Spirol pins (12) and two grubscrews (42) in tilt back plate (41). The ends of grubscrews (42) should be flush with the bottom of the recess in the tilt back plate (41).

28.3 Position the tilt brake bell crank (8) (attached to RH support cap) on the mechanism housing (1).

28.4 Install tilt back plate (41) on the mechanism housing (1) and secure with four screws (13).

28.5 Align the tilt brake bell crank (8) and push tilt brake pivot pin (7) into position.

28.6 Install the push rod/spring fork assembly (14 -19), engaging spherical ends in the tilt brake shoe assembly (39) and tilt back plate (41).

28.7 Position the tilt brake shoe assembly (39) and spring (40) in the tilt back plate (41) and push in the tilt brake shoe axle (11) to secure.

Centre lock

29 To assemble the tilt cover/centre lock assembly, proceed as follows (Fig 6.9):

29.1 If removed, install dowel (35) and two Spirol pins (12) in tilt unit cover (33).

29.2 Install centre lock release lever (34) on dowel (35).

29.3 Install spring (32) in centre lock plunger (30). Install plunger in tilt unit cover (33) and insert dowel (31) in plunger to retain spring (32).

29.4 Install centre lock release lever spring (36), engaging hook in centre lock release lever (34) and securing leg to tilt unit cover (33) with screw (37), using Loctite 222E.

Tilt unit cover and balance knob

30 Install tilt unit cover and balance knob as follows (Fig 6.9):

30.1 Install ‘O’ ring (20) in the tilt unit cover (33).

30.2 Install the assembled tilt cover on the tilt back plate (41), ensuring dowel (31) engages in appropriate slot. Secure assembly with three screws (10).

30.3 Install washer (21) and spring (22) on shaft (23) and secure with pin (24).

30.4 Centralize pin (24) and install drag knob boss (25).

30.5 Install the balance knob (26) and secure with washer (27) and screw (28).

30.6 Install knob bung (29).

Tilt Drag

31 Install the tilt drag mechanism as follows (Fig 6.9):

31.1 If removed, install bearing (26) on shaft of tilt drag assembly (25) and secure with snap ring (27). If removed, install dowel (28) in face of tilt drag assembly (25) so that it protrudes by 2.5 mm

31.2 Install tilt drag shaft in mechanism housing, passing shaft through LH actuator (32), bearings (12) and shim (13)

31.3 Secure tilt drag assembly (25) to mechanism housing (10) with two 12 mm screws (11) and three 16 mm screws (19), noting that 12 mm screws go to top of tilt drag assembly.

31.4 Ensure LH actuator (32) is central in mechanism housing and fully tighten screw (30),

31.5 Install the drag knob (44) and turn fully counter-clockwise. It may be necessary to remove and reposition the drag knob to enable drag to be reduced to zero.

31.6 Turn the knob clockwise half a drag scale division.

31.7 Remove the knob and refit so that ‘0’ on knob is adjacent to mark on tilt drag housing and stop on knob abuts adjuster. If necessary, adjust stop as follows (Fig 5.3):

31.7.1 Remove knob (44).

31.7.2 Slacken screw (25.3) securing stop (25.2) to the tilt drag mechanism (25).

31.7.3 Refit knob (44) so that ‘0’ on knob is adjacent to mark (24.1) on tilt drag housing.

31.7.4 Move stop until it abuts stop (44.1) on knob. Remove the knob and tighten screw (25.3).

31.7.5 Refit knob (44) and turn clockwise to maximum drag and ensure scale reading exceeds ‘9’. Turn knob fully counter-clockwise and ensure scale reads ‘0’ when stop is reached. Re-adjust knob and/or stop as necessary.

31.8 Turn knob fully counter-clockwise and remove.

31.9 Lightly lubricate two springs (49) and two steel balls (48) with LM grease and install in the tilt drag mechanism (23).

31.10 Install drag detent ring (43) in knob (44) and install on tilt drag mechanism with ‘0’ on knob adjacent to mark on base casting. Secure with washer (45) and screw (46) and fit knob bung (47).

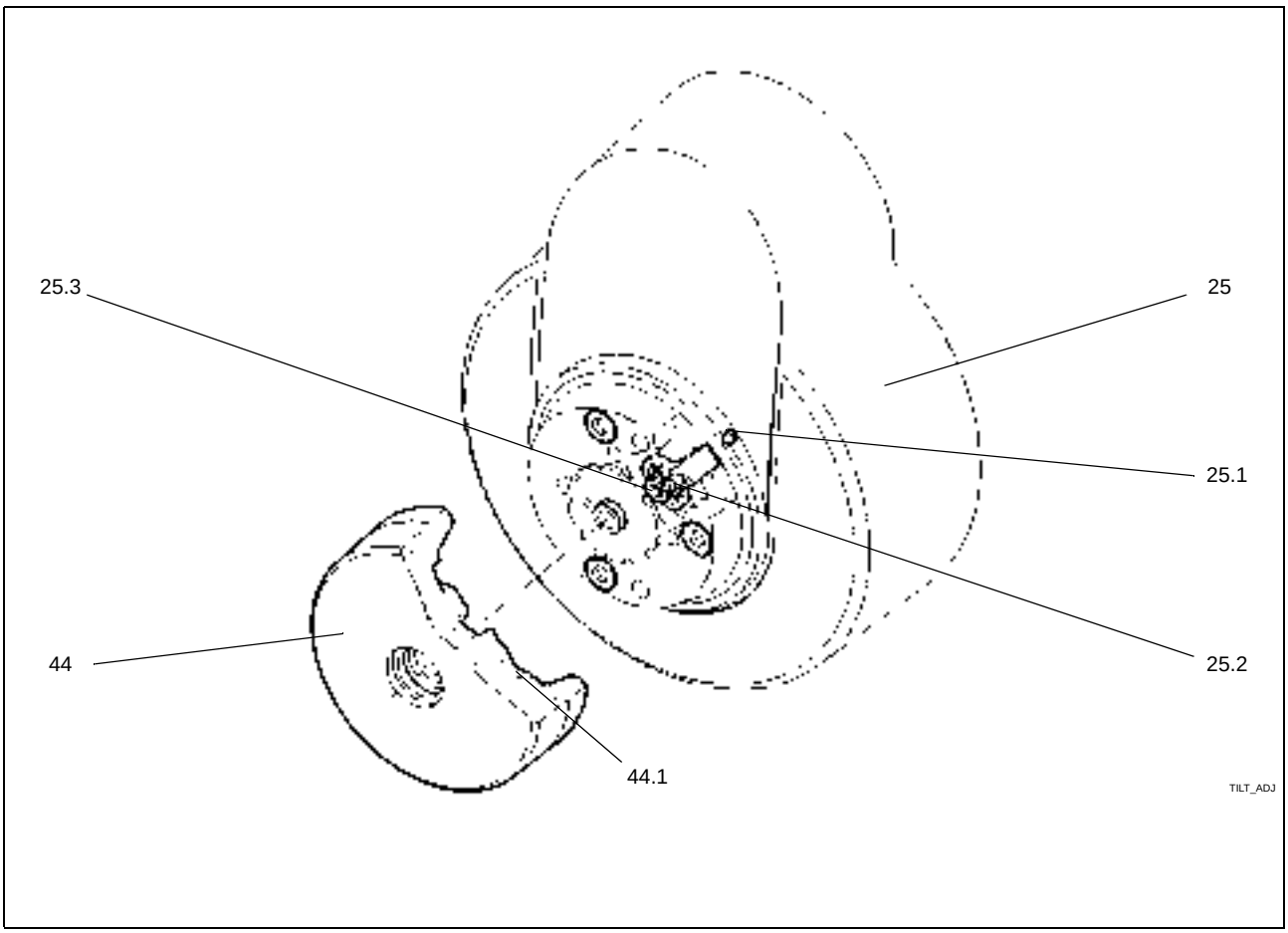


Fig 5.3 Tilt Drag Knob Adjustment

Final adjustment

Tilt brake

32 The tilt brake is adjusted by inserting a 2 mm hexagon wrench through the hole in the bottom of the tilt unit cover (33) and turning the pushrod/spring assembly grub screw (19). Adjust the tilt brake as follows (Fig 6.9):

32.1 Turn the tilt drag knob fully counterclockwise.

32.2 Operate the tilt brake lever from the OFF to the ON position.

32.3 Brake pressure should be felt after approximately one-third of the lever travel. Turn the grub screw (19) clockwise to decrease the amount of lever travel, counter-clockwise to increase.

32.4 Operate the tilt brake lever to the OFF position and ensure that the platform is free to move.

Pan brake

33 The pan brake is adjusted by turning the locating pin (14), accessible from under the right-hand side of the base. Adjust the pan brake as follows (Fig 6.5):

33.1 Turn the pan drag knob fully counterclockwise.

33.2 Operate the pan brake lever (16) from the OFF to the ON position.

33.3 Brake pressure should be felt after approximately one-third of the lever travel. Turn the pin (5) clockwise to decrease the amount of lever travel, counter-clockwise to increase.

33.4 Operate the pan brake lever (16) to the OFF position and ensure that the head is free to rotate.

Pan bearing

34 The pan bearing is adjusted by tightening or slackening nut (47), using pan bearing nut key (Vinten Part No. 3448-902TL). Adjust the pan bearing as follows (Fig 6.4):

34.1 Fully tighten nut (47).

34.2 Fit a 70 kg payload to the head.

34.3 Apply the tilt brake.

34.4 Turn the pan drag knob fully counterclockwise.

34.5 Turn the head through 360° in both directions and ensure no noise or rumble is perceptible in the pan bearing. Slacken nut (47) to achieve this condition if required.

34.6 With a finger on the gap between the mounting plate (20) and the brake reaction plate (22), rock the head using the pan bar and ensure no movement is perceptible between the mounting plate and the reaction plate. Tighten nut (47) to achieve this condition.

34.7 Repeat paras 34.5 and 34.6 until a position is reached where both conditions are achieved.

34.8 Remove the payload.

Balance mechanism bushes (Fig 6.6)

35 The balance mechanism bushes (6) are retained in their housings and adjusted by M5 cap head screws (3, 30). Screws (3), in the platform pivot blocks (5), are accessible by moving the platform slide fully rearwards. Screws (30) in the actuators (32, 40), are accessible when the platform is tipped fully back. Adjust the balance mechanism bushes as follows:

35.1 Turn the tilt drag knob fully clockwise to apply maximum drag.

35.2 Using the pan par, attempt to move the platform and examine each bush (6) for slackness. Tighten the appropriate screw until all slackness is eliminated, without compromising overall movement quality

Base cover plates

36 Install the base cover plates as follows (Fig 6.3):

36.1 Position PCB in base, carefully ensuring LED locates in hole and secure with screw (12). Route battery connector into forward compartment.

36.2 Install switch cover plate assembly (8) and secure with two screws (6).

36.3 Connect the battery and position in forward LH compartment. Install LH cover plate (14) and secure with three screws (6).

36.4 Press bubble illumination switch and ensure LED is lit for approximately 15 seconds.

36.5 Install RH cover plate (7) and secure with three screws (6).

36.6 If removed, adhere buffer pad (3) to brake lever cover plate (4) using Loctite 406.

36.7 Install brake guide housing (5) and brake lever cover plate (4) and secure with four screws (6).

Spring-loaded flap

37 To assemble the spring-loaded flap, proceed as follows (Fig 6.9):

NOTE: The flap springs (3, NI) are handed.

37.1 At each side of the flap (6), install the appropriate flap spring (3, NI), ensuring that right-angle bend in spring faces outwards and engages with slot in flap.

37.2 At each side of the flap, install a spring (5) and flap pin (2) and secure with Spirol pin (4). Ensure assembly slides freely in flap.

38 To install the spring-loaded flap, proceed as follows (Fig 6.9):

38.1 Hold the pins (4) inwards and position the flap, ensuring straight legs of flap springs (3, NI) engage in holes in mechanism housing (1).

38.2 Operate the flap and ensure that springs return it to the closed position.

Section 6

Illustrated Parts List

Contents Para

Illustrations Page

Introduction

1 This parts list is issued for the VECTOR 700/700H pan and tilt heads manufactured by VINTEN BROADCAST LIMITED, Western Way, Bury St Edmunds, Suffolk, IP33 3TB, England.

Ordering Spare Parts

2 Always quote the head serial number when ordering a spare part.

3 When ordering a spare part, please quote the part number, NOT the item number. Certain part numbers have a -900SP series suffix, which denotes a composite spare part. These items are detailed in Fig 6.13 and indicated in the other parts lists by an asterisk (*) against the part number.

4 Due to restrictions placed on the transport of adhesives and other materials, please obtain supplies of consumable materials, listed in Section 3 - Tools and Materials, from your local distributor.

Main Assembly Part Numbers

5 Please ensure that the correct part number is quoted when ordering main assemblies.

ASSEMBLY	PART No.
Vector 700 Pan & Tilt Head - with four-hole flat base	3448-3
Vector 700 Pan & Tilt Head (USA) - with lightweight Mitchell adaptor	3448-5
Vector 700H Pan & Tilt Head - with four-hole flat base	3448-3H
Vector 700H Pan & Tilt Head (USA) - with lightweight Mitchell adaptor	3448-5H
Wedge Adaptor	3389-3
Camera Wedge for Wedge Adaptor	3391-3
Telescopic Pan Bar Assembly and Clamp	3219-62
Fixed Pan Bar Assembly and Clamp	3219-65
Short Fixed Pan Bar Assembly and Clamp	3219-66
Fixing Bolt	L054-714
Washer (for fixing bolt)	L602-122
Spanner (for fixing bolt)	J551-001
Lightweight Mitchell Adaptor	3103-3
Level bubble illumination unit battery - 9V, 6LR61 (PP3, 6AM6, MN1604, E-BLOCK or equivalent)	C550-023

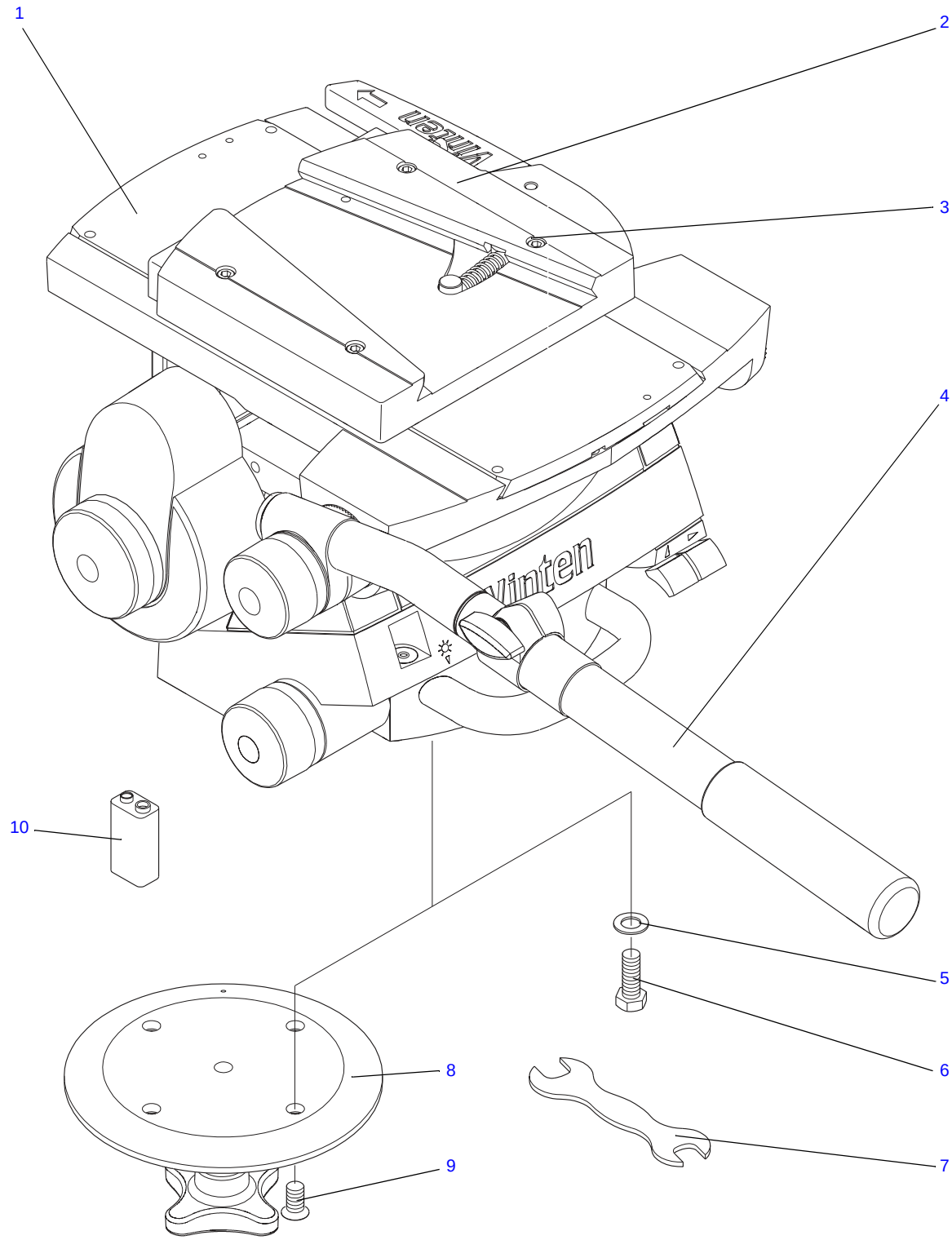


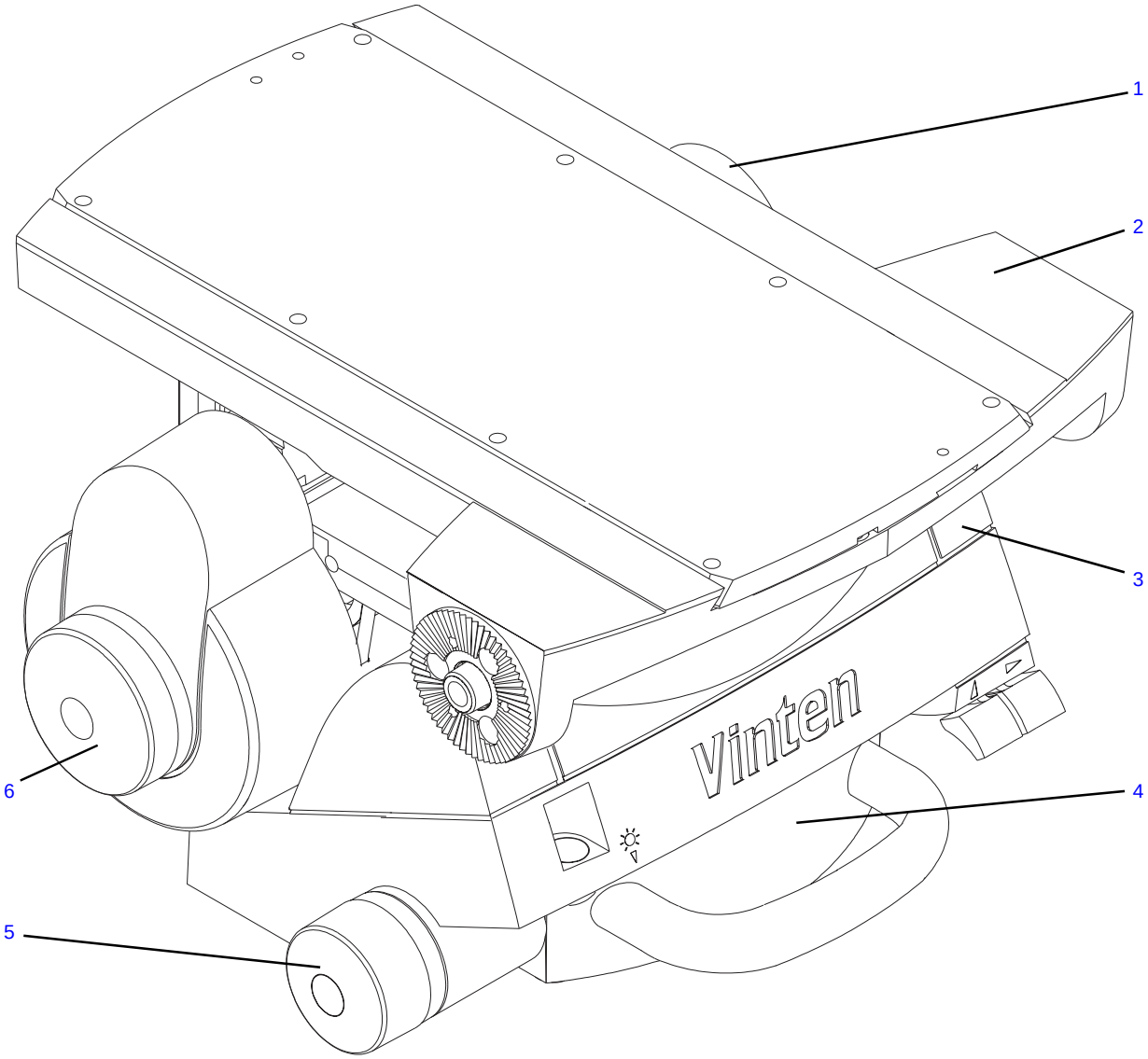
Fig 6.1 Vector 700/700H Pan and Tilt Head

Fig 6.1 Vector 700/700H Pan and Tilt Head

Item	Part No	Nomenclature	Qty
	3448-3	Vector 700 Head, comprising:	
1	3448-11	Main assembly (Fig 6.2)	1
2	3389-3	Wedge adaptor assembly (Fig 6.12)	1
3	M007-707	Screw, cap head, socket, M6 x 30 mm long	4
4	3219-62	Pan bar and clamp assembly (Fig 6.11)	1
5	L602-122	Washer, plain, small, heavy, 3/8 in.	4
6	L054-714	Bolt, hex head, 3/8 in. BSW x 1 in. long	4
7	J551-001	Spanner, open jaw, 1/4 in., and 5/16 in.	1
10	C550-023	Battery, 9 Volts, Size - PP3	1
	3448-3H	Vector 700H Head, comprising:	
1	3348-42	Main assembly (Fig 6.2)	1
2	3389-3	Wedge adaptor assembly (Fig 6.12)	1
3	M007-707	Screw, cap head, socket, M6 x 30 mm long	4
4	3219-62	Pan bar and clamp assembly (Fig 6.12)	1
5	L602-122	Washer, plain, small, heavy, 3/8 in.	4
6	L054-714	Bolt, hex head, 3/8 in. BSW x 1 in. long	4
7	J551-001	Spanner, open jaw, 1/4 in., and 5/16 in.	1
10	C550-023	Battery, 9 Volts, Size - PP3	1
	3448-5	Vector 700 pan and tilt head (USA), comprising:	
1	3348-11	Main assembly (Fig 6.2)	1
2	3389-3	Wedge adaptor assembly (Fig 6.12)	1
3	M007-707	Screw, cap head, socket, M6 x 30 mm long	4
4	3219-62	Pan bar and clamp assembly (Fig 6.11)	1
8	3103-3	Lightweight adapter assembly (Mitchell to Vinten standard), including:	1
9	L054-010	Screw, countersunk head, socket, 3/8in. BSW x 3/4 in. long	4
10	C550-023	Battery, 9 Volts, Size - PP3	1

Fig 6.1 Vector 700/700H Pan and Tilt Head (Cont)

Item	Part No	Nomenclature	Qty
	3448-5H	Vector 700H pan and tilt head (USA), comprising:	
1	3348-42	Main assembly (Fig 6.2)	1
2	3389-3	Wedge adaptor assembly (Fig 6.12)	1
3	M007-707	Screw, cap head, socket, M6 x 30 mm long	4
4	3219-62	Pan bar assembly (Fig 6.11)	1
8	3103-3	Lightweight adapter assembly (Mitchell to Vinten standard), including:	1
9	L054-010	Screw, countersunk head, socket, 3/8in. BSW x 3/4 in. long	4
10	C550-023	Battery, 9 Volts, Size - PP3	1



V700IP05

Fig 6.2 Vector 700/700H Pan and Tilt Head - Main Assembly

Fig 6.2 Vector 700/700H Pan and Tilt Head - Main Assembly

Item	Part No	Nomenclature
	3448-11	Main assembly - Vector 700, comprising:
1	–	Tilt brake/balance knob/centre lock (Fig 6.9)
2	3354-16	Platform assembly (Fig 6.10)
3	3448-23	Right hand support cap assembly (Fig 6.5)
4	–	Base (Fig 6.3)
5	–	Pan drag/brake mechanism (Fig 6.4)
6	3448-12	Balance Mechanism assembly (Fig 6.6)
	3448-42	Main assembly - Vector 700H, comprising:
1	–	Tilt brake/balance knob/centre lock (Fig 6.9)
2	3354-46	Platform assembly (Vector 70H) (Fig 6.10)
3	3448-48	Right hand support cap assembly "H" version (Fig 6.5)
4	–	Base (Fig 6.3)
5	–	Pan drag/brake mechanism (Fig 6.4)
6	3448-43	Balance Mechanism assembly "H" Version (Fig 6.6)

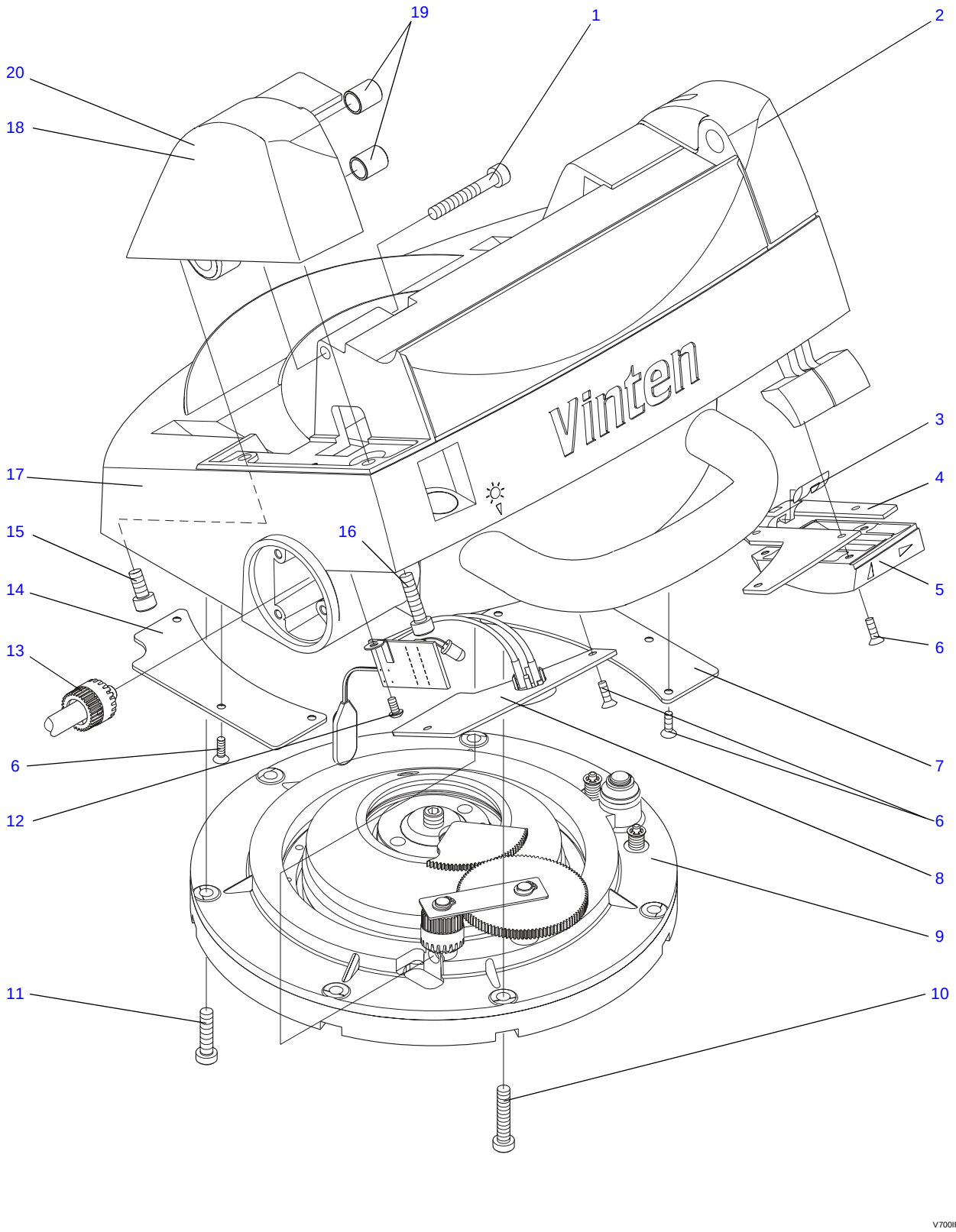


Fig 6.3 Vector 700/700H Pan and Tilt Head - Base

Fig 6.3 Vector 700/700H Pan and Tilt Head - Base

Item	Part No	Nomenclature	Qty
1	M006-718	Screw, cap head, socket, M5 x 40 mm long	1
2	3448-23	Right hand support cap assembly (Fig 6.5), OR	1
	3448-48	Right hand support cap assembly "H" version (Fig 6.5)	1
3	3354-347	Buffer pad	1
4	3354-337	Cover plate (plastic)	1
5	3354-53	Brake lever guide bonding assembly	1
6	M004-103	Screw, countersunk head, pozidrive, M3 x 8 mm long	12
7	3354-304	Cover plate (Right hand)	1
8	3354-25*	Cover plate /PCB assembly	1
9	3448-20	Pan drag unit assembly (Fig 6.4)	1
10	M006-738	Screw, low-profile, cap head, socket, M5 x 25 mm long	4
11	M006-740	Screw, low-profile, cap head, socket, M5 x 20 mm long	3
12	M004-511*	Screw, button head, socket, M3 x 5 mm long	1
13	3448-260	Bevel and drive gear combination (Fig 6.4)	1
14	3354-334	Cover (Base housing left hand)	1
15	M006-704	Screw, cap head, socket, M5 x 16 mm long	1
16	M006-705	Screw, cap head, socket, M5 x 20 mm long	1
17	3354-24*	Base housing (bonding) assembly	1
	3448-32	Left hand support cap assembly, comprising:	
18	3448-246	Support cap (left hand) - machining	1
19	P001-018	Bearing, plain, du bush, 8 mm ID x 10 mm OD x 12 mm long	2
	3448-49	Left hand. support cap assembly "H" version, comprising:	
20	3448-346	Support cap (left hand) - machining "H" version	1
19	P001-018	Bearing, plain, du bush, 8 mm ID x 10 mm OD x 12 mm long	2

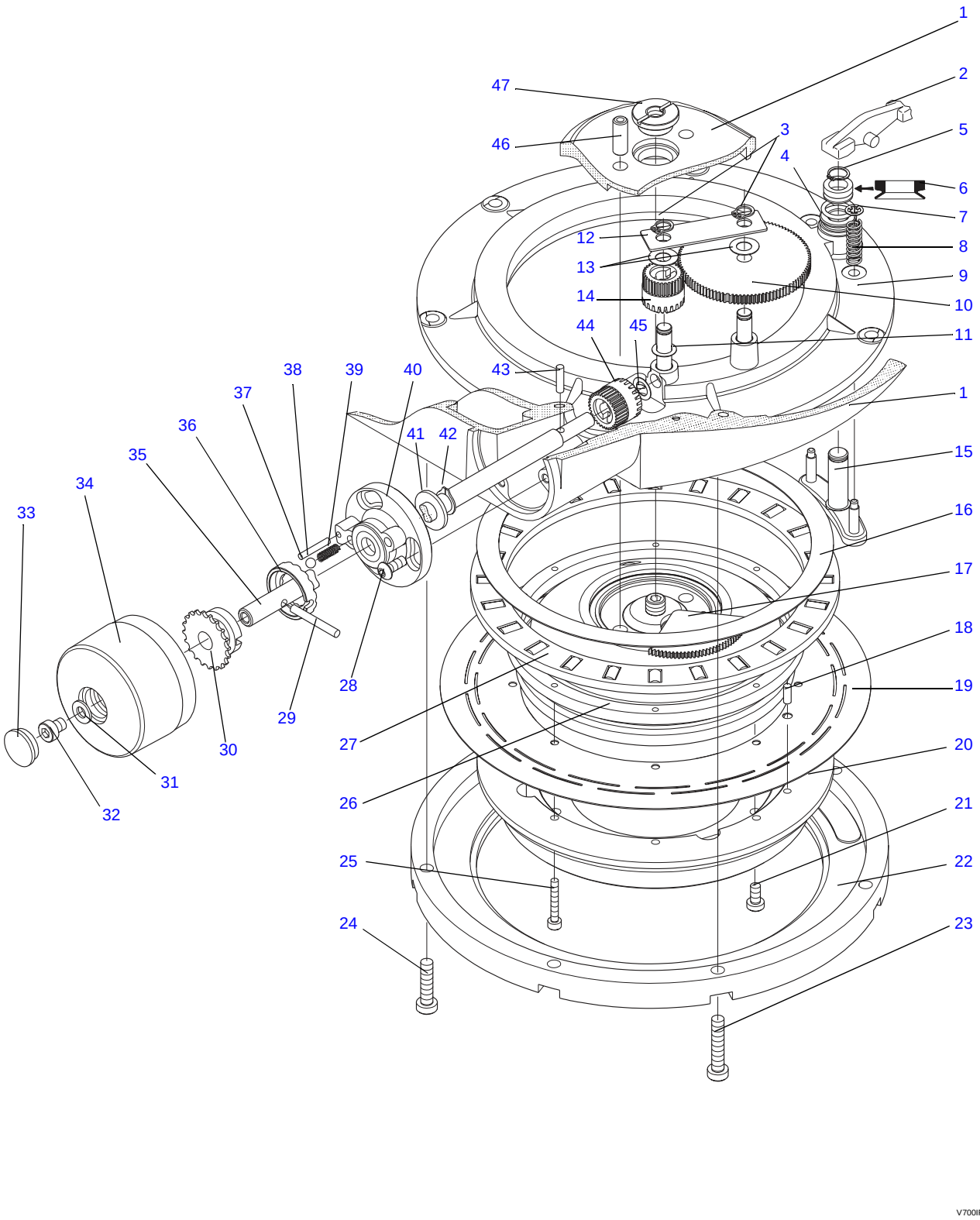


Fig 6.4 Vector 700/700H Pan and Tilt Head - Pan Drag/Brake Mechanism

Fig 6.4 Vector 700/700H Pan and Tilt Head - Pan Drag/Brake Mechanism

Item	Part No	Nomenclature	Qty
1	3354-24*	Base housing (bonding) assembly (Fig 6.3)	1
2	3354-312	Rocker arm (Pan brake) (Fig 6.5)	1
	3448-15	Pan sub-plate assembly, comprising:	1
3	M701-032	Circlip, external, standard, 6 mm shaft dia. x 0.70 mm thick	2
4	R900H019	'O'-Ring, 12.5 mm ID x 1.6 mm section, hardness 60 IRHD	1
5	M701-005	Circlip, external, standard, 8 mm shaft dia. x 0.80 mm thick	1
6	Q500-052	'V'-Seal, to fit 6.5 to 8 mm shaft dia.	1
7	M701-060	Fastener, push-on, reinforced, 3 mm shaft dia. x 0.25 mm thick	2
8	J532-167	Spring, compression, 3/4 in. free length, 1/4 in. hole dia., 7.9 lbf/in. rate	2
9	3448-901SP*	Sub-plate with gear-shafts	1
10	3448-216	Idler gear - pan	1
11	3448-222	Shim - bevel gear	1
12	3448-258	Gear strap	1
13	3448-259	Shim - gear strap	2
14	3448-260	Bevel and drive gear combination	1
15	3354-27*	Pan brake shoe bonding assembly	1
16	3354-328	Disc	1
17	3448-20	Pan drag unit assembly	1
18	M806-004	Pin, coiled-spring, 4 mm dia. x 10 mm long, hdp	6
19	3448-211	Pan brake disc	1
20	3448-900SP*	Mounting plate	1
21	M005-734	Screw, low-profile, cap head, socket, M4 x 10 mm long	6
22	3354-29	Pan brake reaction plate bonding assembly	1
23	M006-738	Screw, low-profile, cap head, socket, M5 x 25 mm long	4
24	M006-740	Screw, low-profile, cap head, socket, M5 x 20 mm long	3
25	M004-711	Screw, cap head, socket, M3 x 20 mm long	8
26	3448-214	Brake disc clamp ring - pan	1
27	3354-34	Thrust bearing assembly, pan unit	1
28	M005-502	Screw, button head, socket, M4 x 10 mm long	3
29	L801-107	Pin, dowel, 1/8 in. dia. x 1 in. long	1
30	3448-249	Serrated boss - pan drag knob	1

Fig 6.4 Vector 700/700H Pan and Tilt Head - Pan Drag/Brake Mechanism (Cont)

Item	Part No	Nomenclature	Qty
31	M600-309	Washer, plain, large, M5	1
32	M006-737	Screw, low-profile, cap head, socket, M5 x 6 mm long	1
33	3354-292	Knob sleeve boss	1
34	3448-248*	Drag knob - pan	1
35	3448-235	Drag knob shaft - pan	1
36	3448-252	Drag detent ring - pan	1
37	M801-058	Pin, dowel, 2.5 mm dia. x 16 mm long	1
38	P900-008	Ball, steel, 4 mm dia.	2
39	J532-067	Spring, compression, 25 mm free length, 3.50 mm OD x 2.71 mm ID, 1.123 N/mm rate	2
40	3354-305	Location disk	1
41	M600-106	Washer, plain, light, M8	1
42	M701-005	Circlip, external, standard, 8 mm shaft dia. x 0.80 mm thick	1
43	L801-108	Pin, dowel, 3/32 in. dia. x 3/8 in. long	1
44	3448-260	Bevel and drive gear combination	1
45	3448-222	Shim - bevel gear	1
46	M801-025	Pin, dowel, extractable, 6 mm dia. x 20 mm long	2
47	3448-234	Nut - pan bearing	1

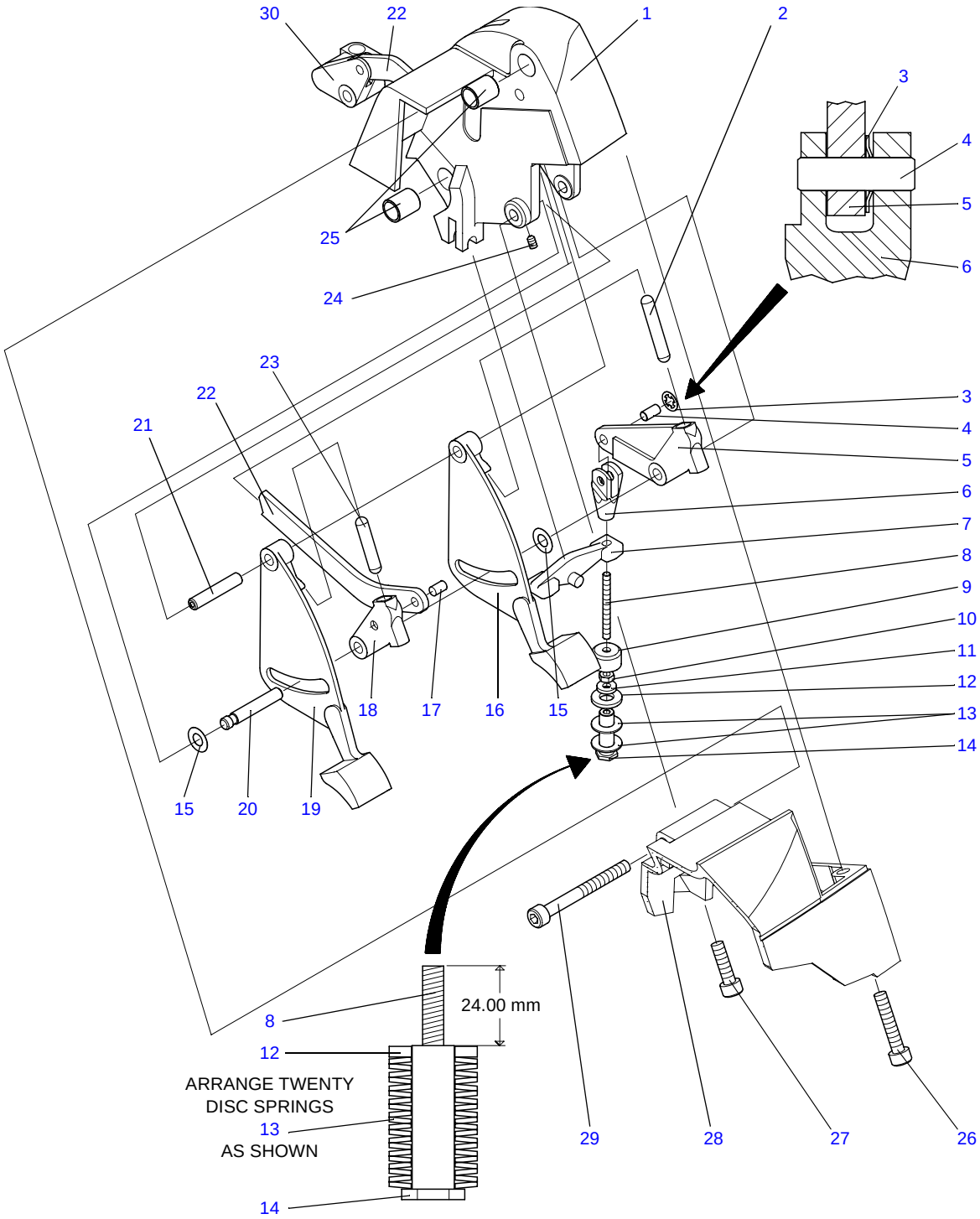


Fig 6.5 Vector 700/700H Pan and Tilt Head - Brake Lever Support Cap Assembly

Fig 6.5 Vector 700/700H Pan and Tilt Head - Brake Lever Support Cap Assembly

Item	Part No	Nomenclature	Qty
	3448-23	Right hand support cap assembly (Vector 700), comprising:	1
1	3448-247	Support cap (right hand) - machining	1
2	3354-250	Actuator rod	1
3	L701-082*	Fastener, push-on, standard, 0.156 in. shaft dia. x 0.010 in. thick	1
4	3354-276	Pin (Pan brake arm / Fork end pivot)	1
5	3354-311	Link arm (Pan brake casting)	1
6	3354-313	Fork end	1
7	3354-312	Rocker arm (Pan brake)	1
	3354-31	Spring sleeve assembly, pan brake, comprising:	1
8	3354-339	Stud	1
9	3354-338	Cup	1
10	M500-060	Nut, M3, standard (hex), full	1
11	3354-269	Washer	1
12	M600-007	Washer, plain, heavy, M6	1
13	M601-261	Spring, disc, 6.2 mm ID x 12.5 mm OD x 0.7 mm thick	20
14	3354-268	Pin	1
15	3354-272	Shim (brake link pivot)	A/R
16	3354-248*	Brake lever, pan	1
17	3354-273	Pin (Tilt brake arm con.) Link	1
18	3354-244	Link arm (Tilt brake)	1
19	3354-247*	Brake lever, tilt	1
20	3354-275	Pin (Pan/tilt Link arm pivot)	1
21	3354-274	Pin (brake lever pivot)	1
22	3354-249	Connecting link (Fig 6.9)	1
23	3354-270	Actuator rod	1
24	M004-807	Screw, grub, knurled cup point, socket head, M3 x 5 mm long	1
25	P001-018*	Bearing, plain, du bush, 8 mm ID x 10 mm OD x 12 mm long	2

Fig 6.5 Vector 700/700H Pan and Tilt Head - Brake Lever Support Cap Assembly

Item	Part No	Nomenclature	Qty
	3448-48	Right hand support cap assembly (Vector 700H), comprising:	
1	3448-347	Support cap (right hand) - machining "H" version	1
2	3354-250	Actuator rod	1
3	L701-082	Fastener, push-on, standard, 0.156 in. shaft dia. x 0.010 in. thick	1
4	3354-276	Pin (Pan brake arm / Fork end pivot)	1
5	3354-311	Link arm (Pan brake casting)	1
6	3354-313	Fork end	1
7	3354-312	Rocker arm (Pan brake)	1
	3354-31	Spring sleeve assembly, pan brake, comprising:	
8	3354-339	Stud	1
9	3354-338	Cup	1
10	M500-060	Nut, M3, standard (hex), full	1
11	3354-269	Washer	1
12	M600-007	Washer, plain, heavy, M6	1
13	M601-261	Spring, disc, 6.2 mm ID x 12.5 mm OD x 0.7 mm thick	20
14	3354-268	Pin	1
15	3354-272	Shim (brake link pivot)	A/R
16	3354-248*	Brake lever, pan	1
17	3354-273	Pin (Tilt brake arm con.) Link	1
18	3354-244	Link arm (Tilt brake)	1
19	3354-247*	Brake lever, tilt	1
20	3354-275	Pin (Pan/tilt Link arm pivot)	1
21	3354-274	Pin (brake lever pivot)	1
23	3354-249	Connecting link	1
22	3354-270	Actuator rod	1
23	M004-807	Screw, grub, knurled cup point, socket head, M3 x 5 mm long	1
24	P001-018*	Bearing, plain, du bush, 8 mm ID x 10 mm OD x 12 mm long	2
26	M006-705	Screw, cap head, socket, M5 x 20 mm long	1
27	M006-704	Screw, cap head, socket, M5 x 16 mm long	1
28	3354-24*	Base housing (bonding) assembly (Fig 6.3)	
29	M006-718	Screw, cap head, socket, M5 x 40 mm long	1
30	3354-246	Bell crank (Tilt brake) (Fig 6.9)	

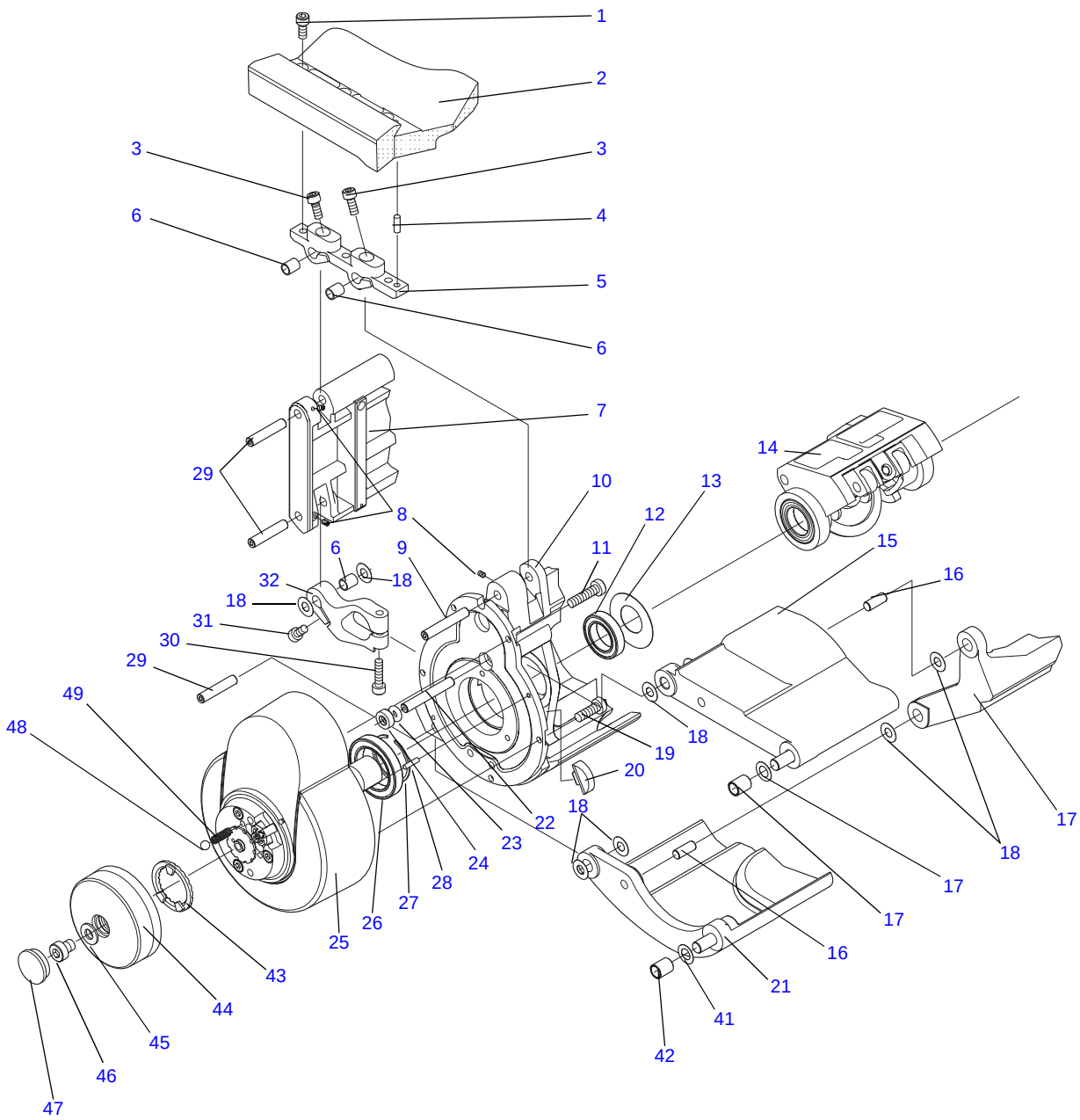


Fig 6.6 Vector 700/700H Pan and Tilt Head - Mechanism Housing Assembly (Sheet 1)

Fig 6.6 Vector 700/700H Pan and Tilt Head - Mechanism Housing Assembly

Item	Part No	Nomenclature	Qty
1	M006-702	Screw, cap head, socket, M5 x 10 mm long	6
2	3354-16	Platform assembly (Vector 700), OR	1
	3354-46	Platform assembly (Vector 700H)	1
	3448-12	Balance Mechanism assembly (Vector 700), OR	
	3448-43	Balance Mechanism assembly (Vector 700H), comprising:	
3	M006-703	Screw, cap head, socket, M5 x 12 mm long	6
4	M800-151	Pin, coiled-spring, 4 mm dia. x 12 mm long, mcp	2
5	3354-280	Block	2
6	N001-043*	Bearing, plain, du bush, 1/4 in. ID x 5/16 in. OD x 3/8 in. long	4
7	3354-923SP	Vertical track member assembly (Vector 700), OR	1
	3354-924SP	Vertical track member assembly (Vector 700H)	1
8	M004-807	Screw, grub, knurled cup point, socket head, M3 x 5 mm long	8
9	3354-296	Pivot pin	2
10	3354-201	Balance mechanism housing	1
11	M005-735	Screw, low-profile, cap head, socket, M4 x 12 mm long	2
12	P302-016	Bearing, ball, radial, 20 mm ID x 32 mm OD x 7 mm long, two seals	3
13	3354-229	Shim (adjustment housing)	2
14	3354-54	Balance adjuster assembly (Vector 700), OR	1
	3354-55	Balance adjuster assembly (Vector 700H)	1
15	3354-926SP	Drive arm assembly	1
16	3354-294	Pivot pin	4
17	3354-925SP	Horizontal track assembly	1
18	3354-206*	Shim (Horizontal track member)	A/R
	3354-299*	Shim (0.075mm)	A/R
19	M005-738	Screw, low-profile, cap head, socket, M4 x 16 mm long	3
20	3354-264	Rear tilt buffer (left hand) (Vector 700), OR	1
	3354-51	Rear tilt buffer assembly (Vector 700H)	1
21	3354-936SP	Lower drive arm assembly	1
22	3354-297	Pivot pin	2
23	Q900H039	'O'-Ring, 1/4 in. nominal ID x 0.070 in. section, hardness 60 IRHD	1
24	3354-415	Seal insert	1

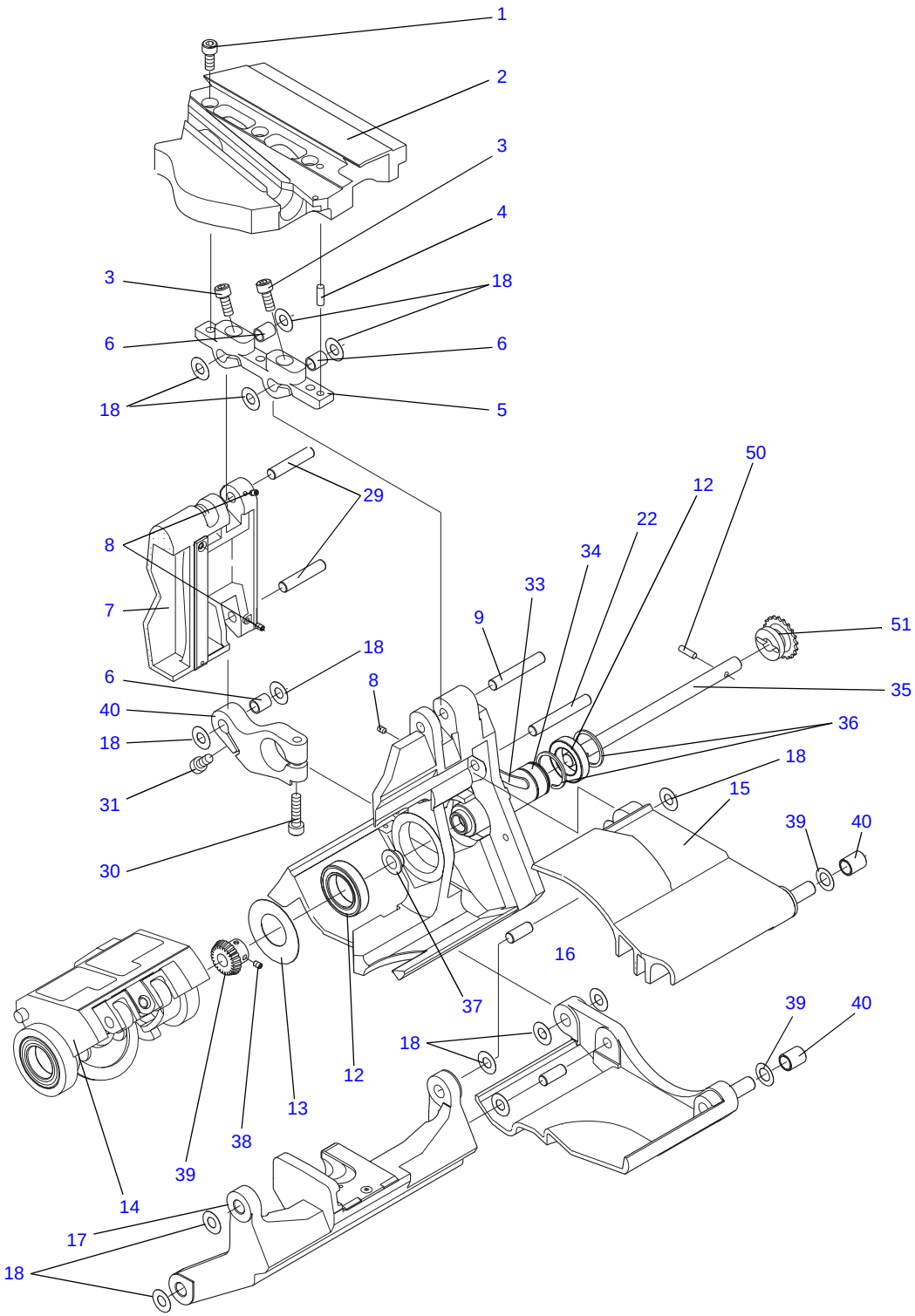


Fig 6.6 Vector 700/700H Pan and Tilt Head - Mechanism Housing Assembly (Sheet 2)

Fig 6.6 Vector 700/700H Pan and Tilt Head - Mechanism Housing Assembly (Cont)

Item	Part No	Nomenclature	Qty
25	3448-19	Tilt drag unit assembly, including:	1
26	P302-017	Bearing, ball, radial, 30 mm ID x 42 mm OD x 7 mm long, two seals	1
27	P605-003	Snap ring, external, 30 mm shaft dia. x 1.5 mm thick	1
28	M801-059	Pin, dowel, 3 mm dia. x 12 mm long	2
29	3354-295	Pivot Pin	2
30	M006-714	Screw, cap head, socket, M5 x 25 mm long	2
31	M006-734	Screw, low-profile, cap head, socket, M5 x 10 mm long	2
32	3354-212	Actuator 40mm (Left Hand)	1
33	3354-288*	Lining (Tilt brake reactor)	1
34	3354-265	Actuator shaft	1
35	3354-218	Pinion shaft	1
36	P605-007	Snap ring, external, 20 mm shaft dia. x 1.2 mm thick	2
37	P003-001	Bearing, plain flanged, plastic, 8 mm ID x 10 mm OD x 5.5 mm long	1
38	M004-812	Screw, grub, cone point, socket head, M3 x 5 mm long	2
39	3354-214	Bevel gear (pinion)	1
40	3354-216	Actuator 40mm (Right Hand)	1
41	3354-209	0.125mm (0.005") Shim.	A/R
	3354-217	0.075mm (0.003") Shim	
	3354-433	Shim (0.002")	
42	P001-018	Bearing, plain, du bush, 8 mm ID x 10 mm OD x 12 mm long	-
43	3448-253	Drag detent ring - tilt	1
44	3448-232*	Tilt drag knob moulding / graphic	1
45	M600-006	Washer, plain, heavy, M5	1
46	M006-737	Screw, low-profile, cap head, socket, M5 x 6 mm long	1
47	3354-292	Knob sleeve boss	1
48	P900-008	Ball, steel, 4 mm dia.	2
49	J532-067	Spring, compression, 25 mm free length, 3.50 mm OD x 2.71 mm ID, 1.123 N/mm rate	2
50	L801-105	Pin, dowel, 1/8 in. dia. x 9/16 in. long	1
51	3354-293	Serrated boss	

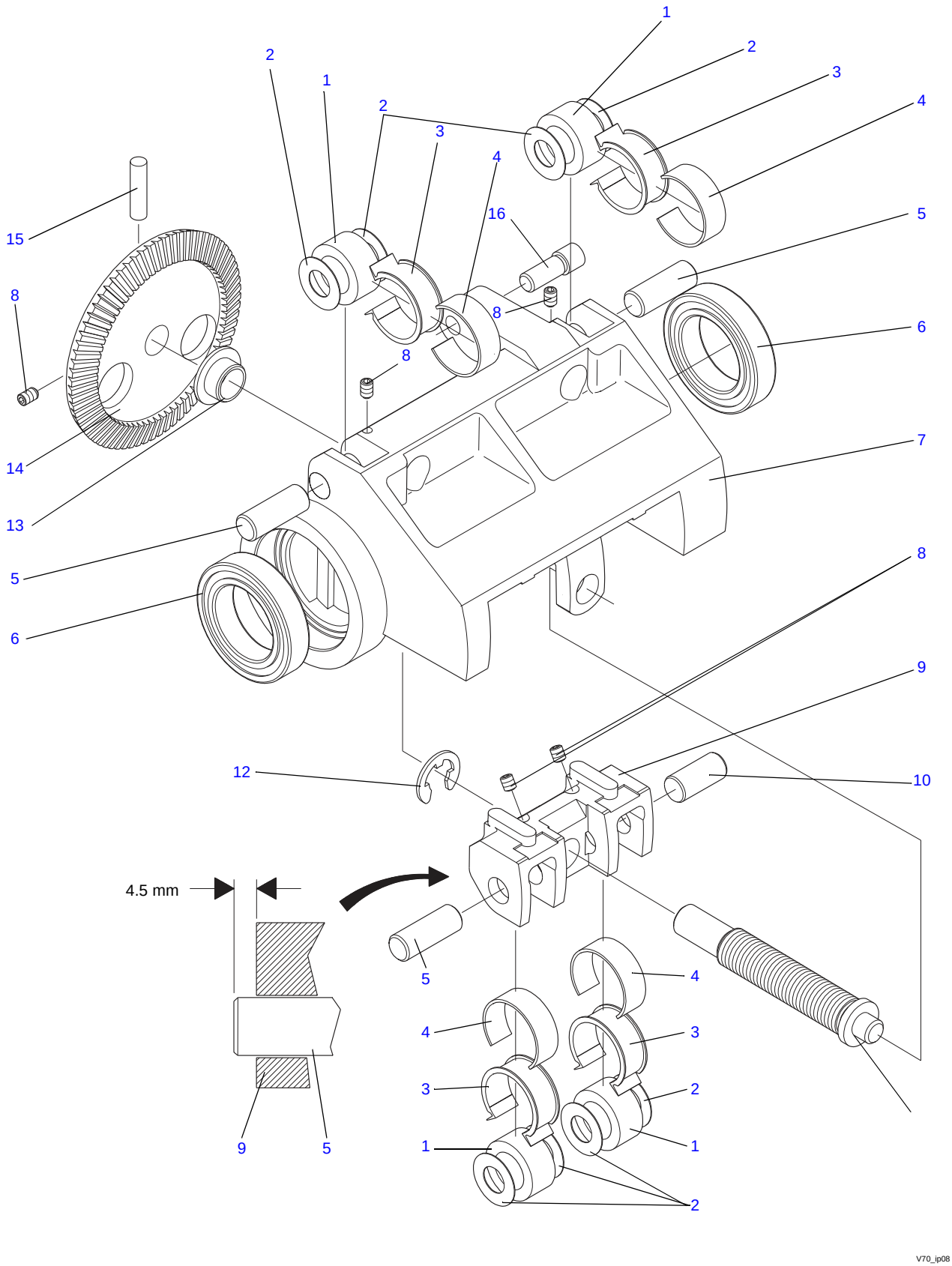


Fig 6.7 Vector 700 Pan and Tilt Head - Balance Adjuster Assembly

Fig 6.7 Vector 700 Pan and Tilt Head - Balance Adjuster Assembly

Item	Part No	Nomenclature	Qty
	3354-54*	Adjustment housing assembly (Vector 700), comprising:	1
1	P603-003*	Bearing, track roller, yoke type, 7 mm bore dia., 16 mm roller dia. x 7.8 mm roller width	4
2	3354-220	Shim (Roller axle)	8
3	3354-227	Track wiper	4
4	3354-226	Track wiper outer	4
5	3354-231	Roller axle (18 mm long)	3
6	P302-016*	Bearing, ball, radial, 20 mm ID x 32 mm OD x 7 mm long, two seals	2
7	3354-446	Adjustment housing	1
8	M004-807	Screw, grub, knurled cup point, socket head, M3 x 5 mm long	4
9	3354-445	Adjustment carriage	1
10	3354-219	Roller axle (15 mm long)	1
11	3354-223	Adjustment thread	1
12	M701-004	'E'-Clip, standard, 9.50 mm shaft dia. x 0.90 mm thick	1
13	P003-001*	Bearing, plain flanged, plastic, 8 mm ID x 10 mm OD x 5.5 mm long	1
14	3354-443	Lift off pin (flat end)	1
15	3354-213	Gear	1
16	M806-006	Pin, coiled-spring, 4 mm dia. x 16 mm long, mcp	1

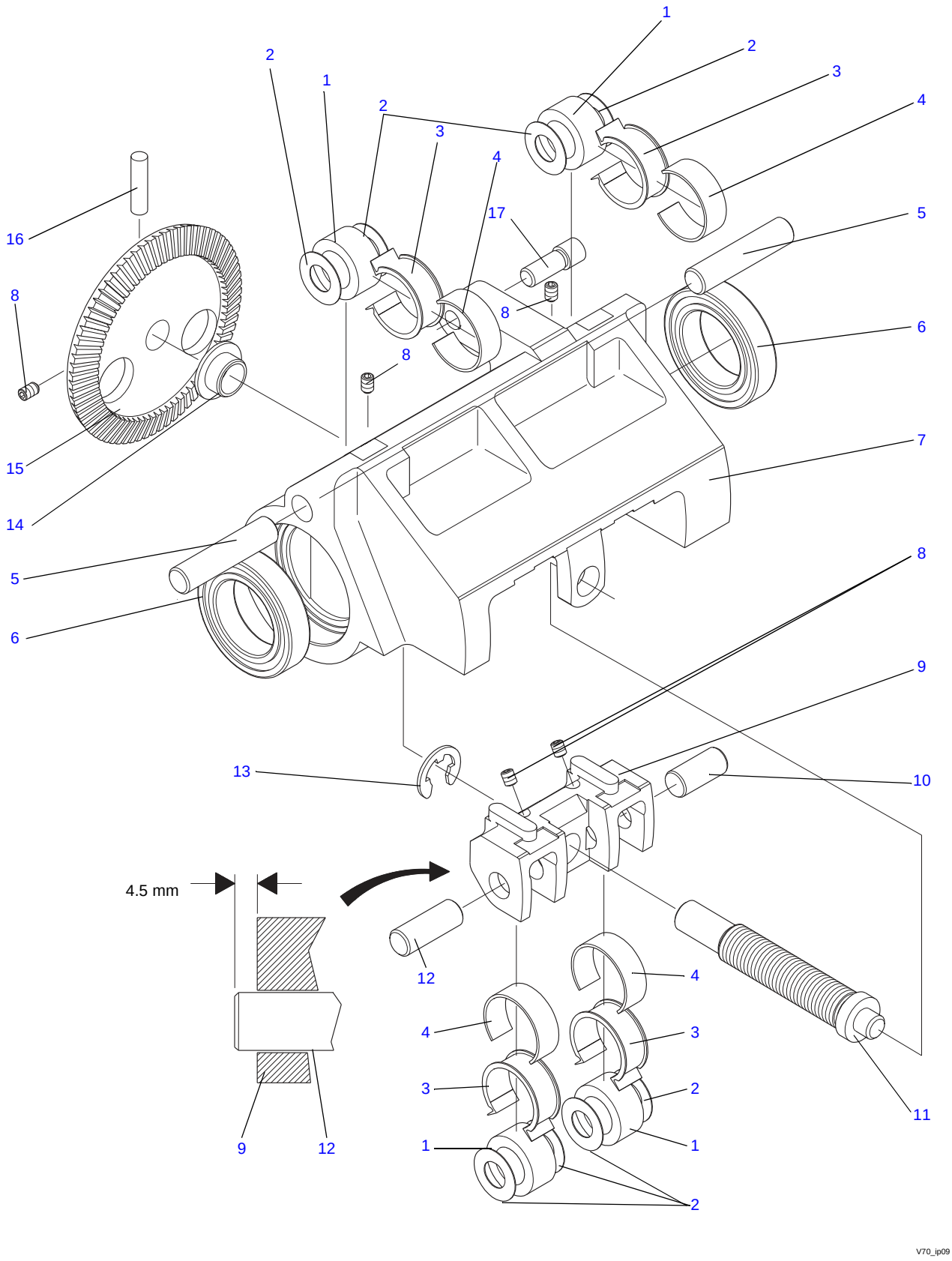


Fig 6.8 Vector 700H Pan and Tilt Head - Balance Adjuster Assembly

Fig 6.8 Vector 700H Pan and Tilt Head - Balance Adjuster Assembly

Item	Part No	Nomenclature	Qty
	3354-55	Balance adjuster assembly (Vector 700H), comprising:	1
1	P603-003*	Bearing, track roller, yoke type, 7 mm bore dia., 16 mm roller dia. x 7.8 mm roller width	4
2	3354-220	Shim (Roller axle)	8
3	3354-227	Track wiper	4
4	3354-226	Track wiper outer	4
5	3354-428	Roller axle (27 mm long)	2
6	P302-016*	Bearing, ball, radial, 20 mm ID x 32 mm OD x 7 mm long, two seals	2
7	3354-447	Adjustment housing	1
8	M004-806	Screw, grub, knurled cup point, socket head, M3 x 4 mm long	5
9	3354-445	Adjustment carriage	1
10	3354-219	Roller axle (15 mm long)	1
11	3354-426	Adjustment thread	1
12	3354-231	Roller axle (18 mm long)	1
13	M701-004	'E'-Clip, standard, 9.50 mm shaft dia. x 0.90 mm thick	1
14	P003-001*	Bearing, plain flanged, plastic, 8 mm ID x 10 mm OD x 5.5 mm long	1
15	3354-213	Gear	1
16	M806-006	Pin, coiled-spring, 4 mm dia. x 16 mm long, mcp	1
17	3354-443	Lift off pin (flat end)	1

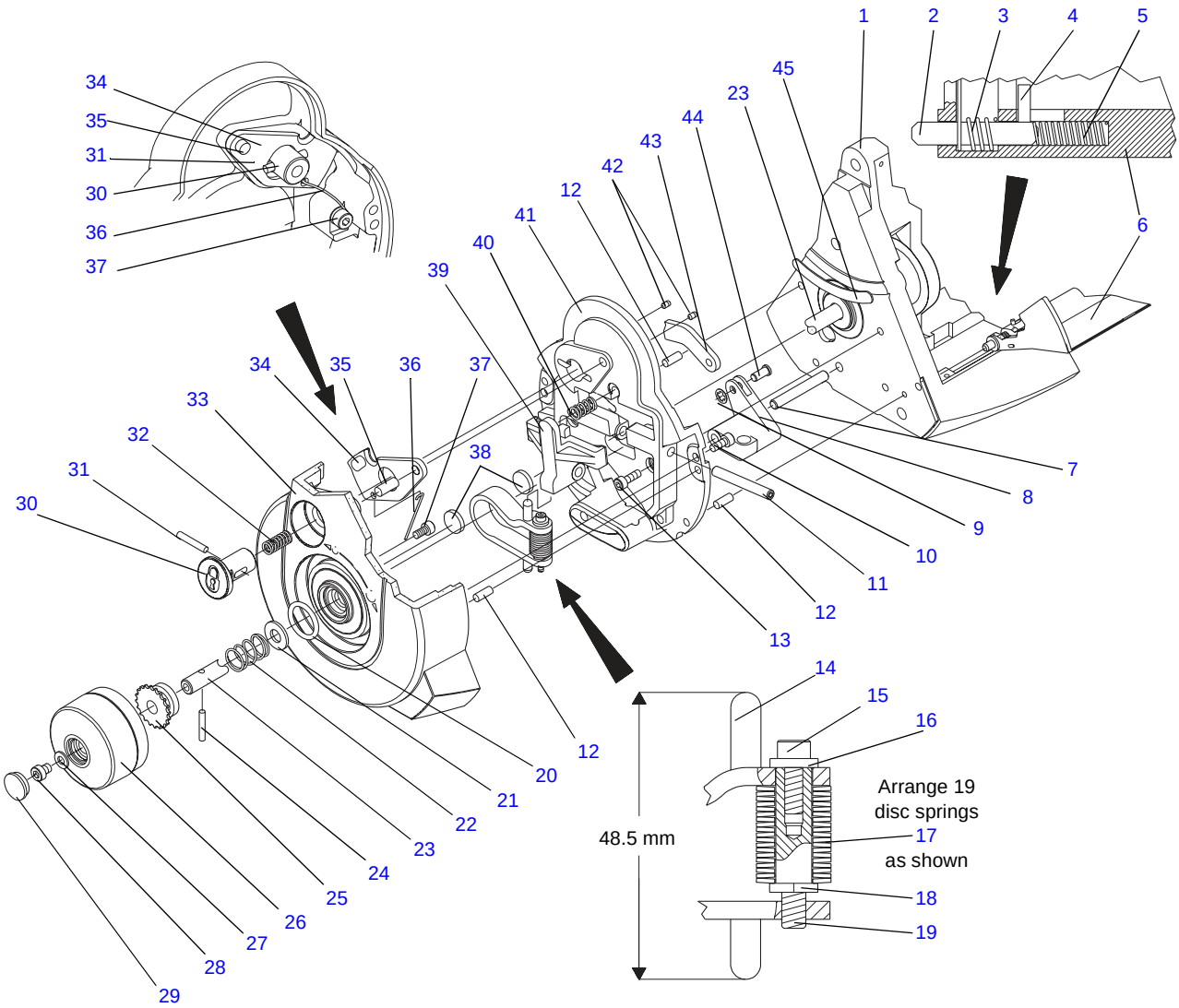


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Fig 6.9 Vector 700/700H Pan and Tilt Head - Tilt Brake/Balance Knob/Centre Lock

Fig 6.9 Vector 700/700H Pan and Tilt Head - Tilt Brake/Balance Knob/Centre Lock

Item	Part No	Nomenclature	Qty
1	3448-12	Balance Mechanism assembly (Vector 700) OR	
	3448-43	Balance Mechanism assembly (Vector 700H) (Fig 6.8)	1
2	3354-279	Flap pin	2
3	3354-210	Flap spring (left hand)	1
NI	3354-215	Flap spring (Right hand)	1
4	M806-028	Pin, coiled-spring, 2 mm dia. x 10 mm long, mdp	2
5	J532-166	Spring, compression, 1/2 in. free length, 5/32 in. hole dia., 9.2 lbf/in. rate	2
6	3354-211	Flap guard (Moulding)	1
7	3354-285	Pin (Tilt brake bell crank pivot)	1
8	3354-246	Bell crank (Tilt brake)	1
9	L701-082	Fastener, push-on, standard, 0.156 in. shaft dia. x 0.010 in. thick	1
10	M005-734	Screw, low-profile, cap head, socket, M4 x 10 mm long	3
11	3354-284	Pin (Tilt brake shoe pivot crank)	1
12	M806-004	Pin, coiled-spring, 4 mm dia. x 10 mm long, hdp	2
13	M005-706	Screw, cap head, socket, M4 x 16 mm long	4
	3354-30	Push rod/spring fork assembly tilt brake, comprising:	1
14	3354-267	Push rod / Spring fork.	1
15	M004-718	Screw, cap head, socket, M3 x 10 mm long	1
16	3354-269	Washer	1
17	M601-261	Spring, disc, 6.2 mm ID x 12.5 mm OD x 0.7 mm thick	19
18	3354-268	Pin	1
19	M005-811	Screw, grub, cone point, socket head, M4 x 10 mm long	1
20	Q001-015	'O'-Ring, 5/16 in. nominal ID x 0.103 in. section, hardness 75 IRHD	1
21	M600-106	Washer, plain, light, M8	1
22	J532-164	Spring, compression, 5/8 in. free length, 1/2 in. hole dia., 15.6 lbf/in. rate	1
23	3354-218	Pinion shaft (Fig 6.6)	1
24	L801-105	Pin, dowel, 1/8 in. dia. x 9/16 in. long	1
25	3354-293	Serrated boss	1
26	3354-341*	Counter balance knob	1
27	M600-309	Washer, plain, large, M5	1
28	M006-737*	Screw, low-profile, cap head, socket, M5 x 6 mm long	1
29	3354-292	Knob sleeve boss	1

Fig 6.9 Vector 700/700H Pan and Tilt Head - Tilt Brake/Balance Knob/Centre Lock

Item	Part No	Nomenclature	Qty
	3354-37	Tilt cover/centre lock assembly, comprising:	1
30	3354-258	Centre lock plunger	1
31	L801-106	Pin, dowel, 1/8 in. dia. x 3/4 in. long	1
32	J532-165	Spring, compression, 0.500 in. free length, 0.180 in. OD x 0.188 in. hole dia., 7.00 lbf/in. rate	1
33	3354-256	Tilt housing cover R.H	1
34	3354-259	Centre lock release lever	1
35	M801-048	Pin, dowel, 5 mm dia. x 12 mm long	1
36	3354-260	Spring, Centre lock release lever	1
37	M005-716	Screw, cap head, socket, M4 x 8 mm long	1
38	3354-424	Buffer pad	2
39	3354-33*	Tilt brake shoe bonding assembly	1
40	J532-145	Spring, compression, 0.500 in. free length, 0.300 in. OD x 0.313 in. hole dia., 46.00 lbf/in. rate	1
41	3354-257	Tilt back plate	1
42	M004-807	Screw, grub, knurled cup point, socket head, M3 x 5 mm long	2
43	3354-249	Connecting link (Fig 6.5)	1
44	3354-283	Pin (Conn. Link/bell crank)	1
45	3354-288*	Lining (Tilt brake reactor) (Part of 3448-12/3448-43)	1

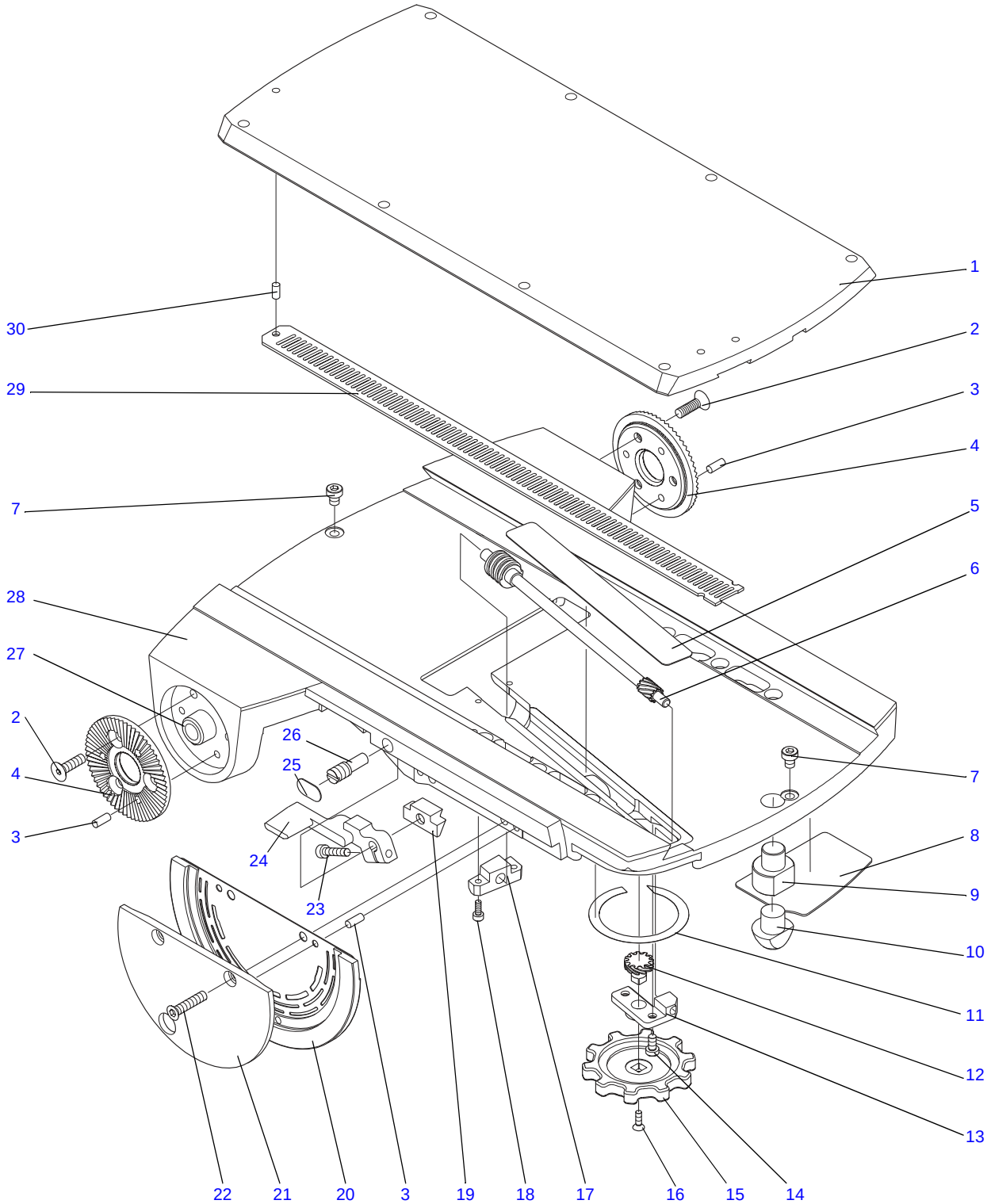

Fig 6.10 Vector 700/700H Pan and Tilt Head - Platform Assembly

Fig 6.10 Vector 700/700H Pan and Tilt Head - Platform Assembly

Item	Part No	Nomenclature	Qty
1	3354-242	Standard platform slide	1
2	M006-921*	Screw, countersunk head, socket, M5 x 10 mm long	6
3	M806-004*	Pin, coiled-spring, 4 mm dia. x 10 mm long, hdp	8
4	3354-261*	Serrated disc (Mk7 type)	2
5	3354-255*	Label	1
6	3354-52	Adjustment shaft assembly	1
7	M006-737	Screw, low-profile, cap head, socket, M5 x 6 mm long	2
8	3423-34	Serial number label (Vector 700)	1
9	3354-425*	Front stop bung (Vector 700H only)	1
10	3354-266*	Platform buffer	1
11	3354-278*	PTFE Strip	1
12	3354-238	Platform adjuster pinion	1
13	3354-243	Bearing bracket	1
14	M005-733	Screw, cap head, socket, M4 x 8 mm long	2
15	3354-239*	Platform adjuster knob	1
16	M004-103	Screw, countersunk head, pozidrive, M3 x 8 mm long	1
17	3354-240	Shaft support	1
18	M004-703	Screw, cap head, socket, M3 x 8 mm long	2
19	3354-448*	Slide clamp block	1
20	3354-36	Brake disk tilt assembly	1
21	3354-263	Tilt brake centre	1
22	M006-923	Screw, countersunk head, socket, M5 x 16 mm long	2
23	M005-706	Screw, cap head, socket, M4 x 16 mm long	1
24	3354-235	Slide clamp lever	1
25	3354-234*	Cover, slide clamp lever	1
26	3354-233	Slide clamp screw	1
27	L850-036*	Threaded-insert, wire thread insert (helicoil), 3/8 in. BSF x 1-1/2 Diameters long	2
28	3354-230*	Platform	1
29	3354-236	Rack strip	1
30	M806-031	Pin, coiled-spring, 4 mm dia. x 8 mm long, mdp	3

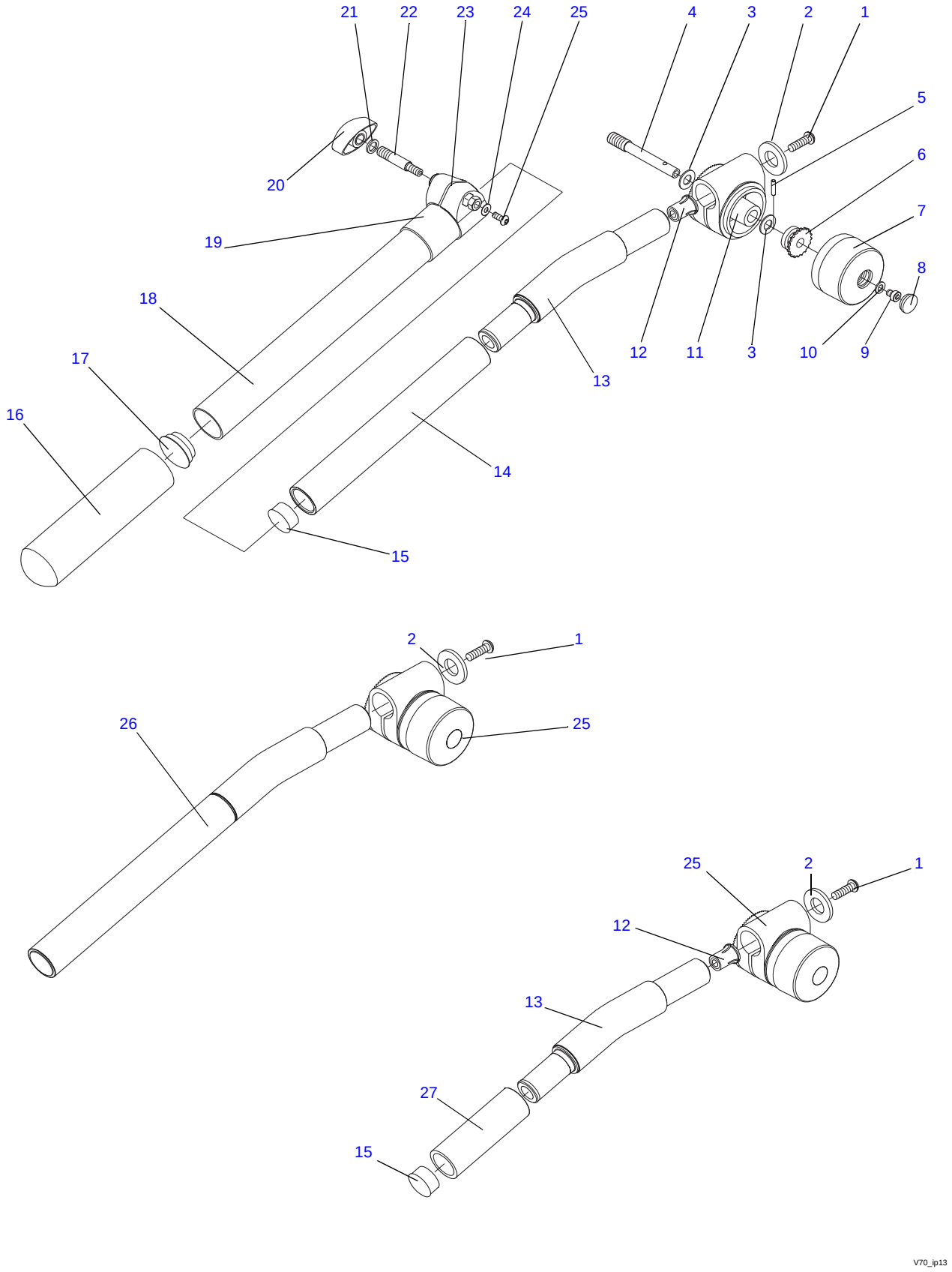

Fig 6.11 Vector 700/700H Pan and Tilt Head - Pan Bars

Fig 6.11 Vector 700/700H Pan and Tilt Head - Pan Bars

Item	Part No	Nomenclature	Qty
	3219-62	Pan bar and clamp assembly, comprising:	
1	M007-506	Screw, button head, socket, M6 x 20 mm long	1
2	3308-159	Washer	1
	3219-60	Pan bar clamp assembly (Vector 70), consisting of:	
3	M600-009	Washer, plain, heavy, M8	2
4	3219-283	Pan bar clamp shaft [was 3354-295]	1
5	L801-105	Pin, dowel, 1/8 in. dia. x 9/16 in. long	1
6	3354-293	Serrated boss	1
7	3354-290	Knob	1
8	3354-292*	Knob bung	1
9	M006-737*	Screw, low-profile, cap head, socket, M5 x 6 mm long	1
10	M600-006*	Washer, plain, heavy, M5	1
11	3219-280	Pan bar clamp (Vector)	1
	3219-61	Pan bar assembly (Vector 70), consisting of:	
	3219-65	Fixed bar assembly (Vector 70), consisting of:	
12	M500-085	Threaded-insert, blind captive nut, M6	1
13	3219-290	Fixed tube spigot end for long bar	1
14	3219-291	Fixed tube control end long	1
15	J550-093	Plug, tube-end, to fit 1 in. tube OD	1
	3219-64	Sliding tube assembly (Vector 70), consisting of:	
16	3219-276	Pan bar grip (Mk 7B)	1
17	J550-104	Plug, tube-end, to fit 1-1/4 in. tube OD	1
18	3219-63	Sliding tube / clamp assembly (Vector 70)	1
19	3219-289	Shrink wrap sleeve (Vector 70)	1
20	K403-014	Knob, locking-key, female, M8 thread, 40 mm wide	1
21	3219-211	Washer	1
22	3219-288	Clamp shaft (telescopic pan bar) (Vector 70)	1
23	M500-082	Nut, M6, standard (hex), full	1
24	M600-304	Washer, plain, large, M4	1
25	M005-511	Screw, button head, socket, M4 x 8 mm long	1

Fig 6.11 Vector 700/700H Pan and Tilt Head - Pan Bars (Cont)

Item	Part No	Nomenclature	Qty
	3219-67	Short pan bar and clamp assembly (Vector 70), comprising:	
1	M007-506	Screw, button head, socket, M6 x 20 mm long	1
2	3308-159	Washer	1
25	3219-60	Pan bar clamp assembly (Vector 70) - parts as above	1
26	3219-65	Fixed bar assembly (Vector 70) - parts as above	1
	3219-66	Fixed bar / clamp assembly (Vector 70), comprising:	
1	M007-506	Screw, button head, socket, M6 x 20 mm long	1
2	3308-159	Washer	1
	3219-68	Short pan bar assembly (Vector 70), consisting of:	
12	M500-085	Threaded-insert, blind captive nut, M6	1
13	3219-290	Fixed tube spigot end for long bar	1
15	J550-093	Plug, tube-end, to fit 1 in. tube OD	1
25	3219-60	Pan bar clamp assembly (Vector 70) - parts as above	1
27	3219-297	Short fixed tube	1

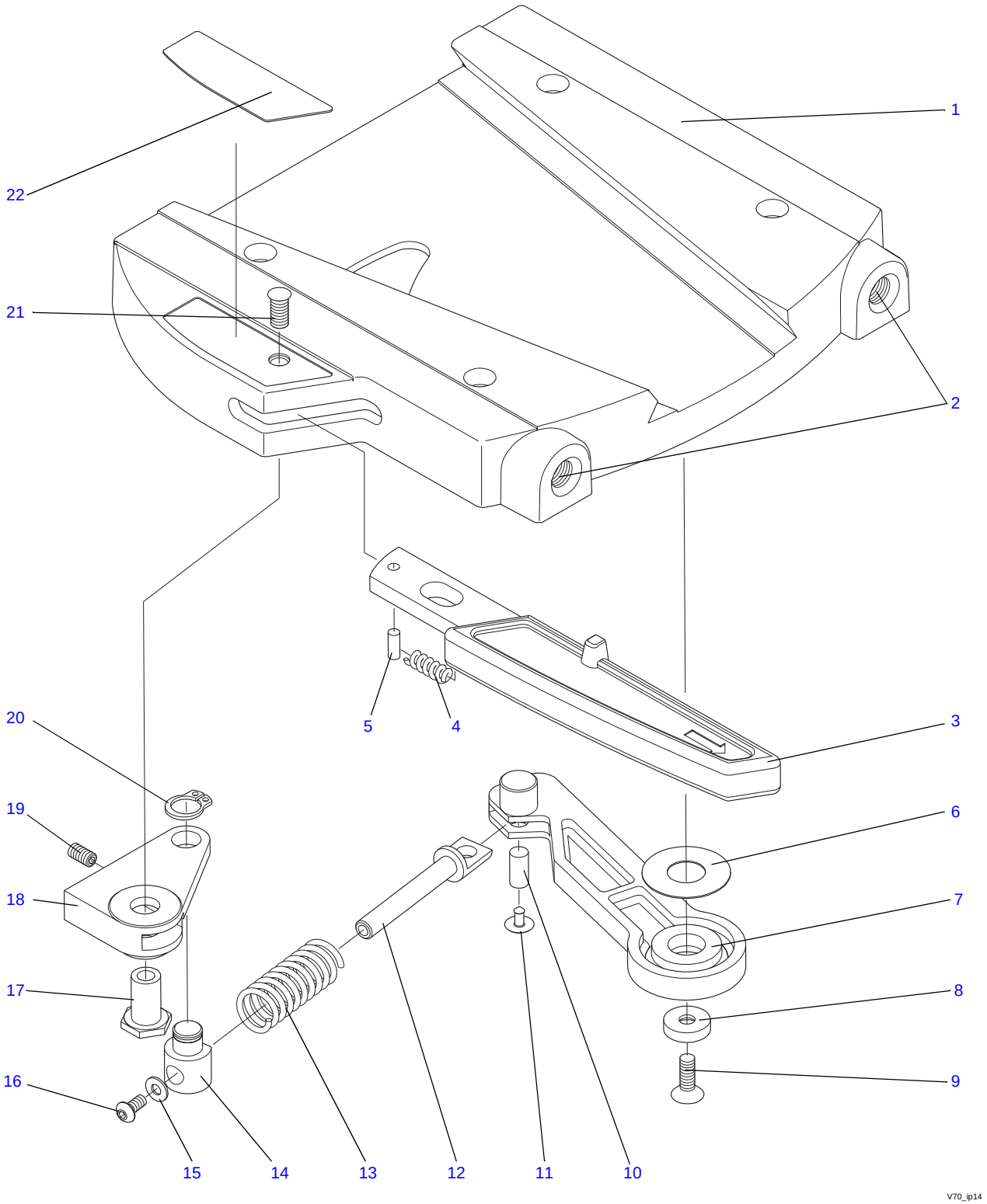

Fig 6.12 Vector 700/700H Pan and Tilt Head - Wedge Adaptor Assembly

Fig 6.12 Vector 700/700H Pan and Tilt Head - Wedge Adaptor Assembly

Item	Part No.	Nomenclature	Qty
	3389-3	Automatic wedge adaptor, comprising:	1
1	3389-301	Body	1
2	L850-054	Threaded-insert, wire thread insert (helicoil), 3/8 in. BSW x 2 Diameters long	2
3	3389-21	Handle assembly (10mm pivot)	1
4	J532-159	Spring, compression, 0.750 in. free length, 0.180 in. OD x 0.188 in. hole dia., 17.00 lbf/in. rate	1
5	M806-004	Pin, coiled-spring, 4 mm dia. x 10 mm long, hdp	1
6	3389-210	Washer	1
7	3389-208	Swing Arm	1
8	3389-212	Screw head spacer	1
9	M006-911	Screw, countersunk head, socket, M5 x 12 mm long	1
10	L801-103	Pin, dowel, extractable, 1/4 in. dia. x 1/2 in. long	1
11	3389-310	Running plate	1
12	3389-206	Shaft	1
13	J532-161	Spring, compression, 1.516 in. free length, 0.473 in. OD x 0.792 in. hole dia., 109.744 lbf/in. rate	1
14	3389-205	Pivot bush	1
15	M600-004	Washer, plain, heavy, M4	1
16	M005-513	Screw, button head, socket, M4 x 6 mm long	1
17	3389-304	Lever pivot (10mm diameter)	1
18	3389-302	Lever mounting (adjustable 10mm pivot)	1
19	M006-812	Screw, grub, dog point, socket head, M5 x 8 mm long	1
20	M701-002	Circlip, external, standard, 5 mm shaft dia. x 0.60 mm thick	1
21	M100-003	Stud, self-clinching, M6 thread x 12 mm long	1
22	3389-309	Name label	

Fig 6.13 Vector 700/700H Pan And Tilt Head - Composite Spare Parts List

Part No	Nomenclature	Qty
3354-900SP	Adaptor plate kit (for use on 'Hawk' and 'Teal' pedestals), comprising:	
3384-204	Adaptor ring	1
L054-004	Screw, skt cap hd, 3/8 in. BSW x 3/4 in. lg	4
L850-054	Helicoil, 3/8 in. BSW x 3/4 in. lg	4
3354-917SP	Brake pads kit, comprising:	
3354-27	Pan brake shoe assembly	1
3354-33	Tilt brake shoe assembly	1
3354-288	Lining - tilt brake reaction	1
3354-336	Lining - pan brake shoe	1
3354-919SP	Levers kit, comprising:	
3354-235	Slide clamp lever	1
3354-247	Tilt brake lever	1
3354-248	pan brake lever	1
3354-922SP	Platform assembly (Spares), comprising:	
3354-230	Platform	1
3354-261	Serrated disc (Mk7 type)	2
3354-448	Slide clamp block	1
3354-266	Platform buffer	1
3354-425	Front stop bung	1
3354-278	PTFE Strip	1
3354-255	Label	1
3354-234	Cover, slide clamp lever	1
M006-921	Screw, countersunk head, socket, M5 x 10 mm long	6
L850-036	Threaded-insert, wire thread insert (helicoil), 3/8 in. BSF x 1-1/2 Diameters long	2
M806-004	Pin, coiled-spring, 4 mm dia. x 10 mm long, hdp	6

Fig 6.13 Vector 700/700H Pan And Tilt Head - Composite Spare Parts List (Cont)

Part No	Nomenclature	Qty
3354-923SP	Vertical track member assembly (Vector 700), comprising:	
3354-207	Vertical track member	1
3354-208	Vertical track	2
L804-161	Pop rivet, Tucker TAP/K/44-BS	2
L800-007	Headed spring pin, 5/64 in. dia x 1/4 in. lg	2
3354-924SP	Vertical track member assembly (Vector 700H), comprising:	
3354-427	Vertical track member	1
3354-208	Vertical track	2
L804-161	Pop rivet, Tucker TAP/K/44-BS	2
L800-007	Headed spring pin, 5/64 in. dia x 1/4 in. lg	2
3354-925SP	Horizontal track assembly (Vector 700/700H), comprising:	
3354-204	Horizontal track member	1
3354-205	Horizontal track	2
M004-911	Screw, skt csk hd, M3 x 8 mm lg	1
L800-007	Headed spring pin, 5/64 in. dia x 1/4 in. lg	1
N001-044	Plain bearing, 1/4 in. dia x 5/16 in. OD x 1/4 in. lg, Glacier 04DU04	4
3354-926SP	Drive arm assembly, comprising:	
3354-202	Drive arm	1
3354-298	Pin	2
N001-044	Plain bearing, 1/4 in. dia x 5/16 in. OD x 1/4 in. lg, Glacier 04DU04	2
3354-927SP	Base assembly, with electronics, comprising:	
3354-24	Base housing	1
3354-25	Plate assembly	2
M004-109	Screw, Pozi csk hd, M3 x 8 mm lg	2
M004-511	Screw, skt butt hd, M3 x 5 mm lg	1

Fig 6.13 Vector 700/700H Pan And Tilt Head - Composite Spare Parts List (Cont)

Part No	Nomenclature	Qty
3354-936SP	Drive arm assembly, lower, comprising:	
3354-203	Lower drive arm	1
3354-298	Pin	2
N001-043	Plain bearing, 1/4 in. dia x 5/16 in. OD x 3/8 in. lg, Glacier 04DU06	2
3448-900SP	Mounting plate, comprising:	
3448-213	Mounting plate	1
L850-052	Threaded-insert, wire thread insert (helicoil), 3/8 in. BSW x 1 Diameters long	4
3448-901SP	Sub-plate with gear-shafts, comprising:	
3448-215	Sub - plate - pan	1
3448-220	Bevel gear shaft	1
3448-237	Idler gear shaft - pan sub plate	1
3448-903SP	Vertical track member / actuator assembly repair kit (V700), comprising:	
3354-923SP	Vertical track assembly	1
3354-54	Adjustment housing assembly	1
3354-206	Slim (Horizontal track member)	10
3354-299	Shim (0.075mm)	10
L701-082	Fastener, push-on, standard, 0.156 in. shaft dia. x 0.010 in. thick	1
M004-103	Screw, countersunk head, pozidrive, M3 x 8 mm long	12
M004-812	Screw, grub, cone point, socket head, M3 x 5 mm long	2
M005-706	Screw, cap head, socket, M4 x 16 mm long	4
M005-734	Screw, low-profile, cap head, socket, M4 x 10 mm long	3
M005-735	Screw, low-profile, cap head, socket, M4 x 12 mm long	2
M005-738	Screw, low-profile, cap head, socket, M4 x 16 mm long	3
M006-704	Screw, cap head, socket, M5 x 16 mm long	2
M006-705	Screw, cap head, socket, M5 x 20 mm long	2
M006-718	Screw, cap head, socket, M5 x 40 mm long	2

Fig 6.13 Vector 700/700H Pan And Tilt Head - Composite Spare Parts List (Cont)

Part No	Nomenclature	Qty
3448-904SP	Vertical track member / actuator assembly repair kit (V700H), comprising:	
3354-924SP	Vertical track member assembly (70H)	1
3354-55	Balance adjuster assembly (70H)	1
3354-206	Slim (Horizontal track member)	10
3354-299	Shim (0.075mm)	10
L701-082	Fastener, push-on, standard, 0.156 in. shaft dia. x 0.010 in. thick	1
M004-103	Screw, countersunk head, pozidrive, M3 x 8 mm long	12
M004-812	Screw, grub, cone point, socket head, M3 x 5 mm long	2
M005-706	Screw, cap head, socket, M4 x 16 mm long	4
M005-734	Screw, low-profile, cap head, socket, M4 x 10 mm long	3
M005-735	Screw, low-profile, cap head, socket, M4 x 12 mm long	2
M005-738	Screw, low-profile, cap head, socket, M4 x 16 mm long	3
M006-704	Screw, cap head, socket, M5 x 16 mm long	2
M006-705	Screw, cap head, socket, M5 x 20 mm long	2
M006-718	Screw, cap head, socket, M5 x 40 mm long	2
3448-915SP	Bearings kit, comprising:	
N001-043	Glacier D.U. bearing	10
N001-044	Glacier D.U. bearing	4
P001-018	Glacier D.U bearing	4
P003-001	Flanged plastic bearing	2
P302-016	Radial bearing	5
P600-015	Needle roller bearing	24
P603-003	Yoke type roller bearing	4
3448-918SP	Knobs kit, comprising:	
3354-292	Drag knob bung	3
3354-239	Platform adjustment knob	1
3354-341	Balance knob	1
3448-232	Tilt drag knob	1
3448-248	Pan drsg knob	1
M004-102	Pozidrive countersunk head screw	1

Fig 6.13 Vector 700/700H Pan And Tilt Head - Composite Spare Parts List (Cont)

Part No	Nomenclature	Qty
M006-737	Low profile socket cap head screw	3
M600-006	Plain washer	3