



Operating Instructions

HANNING & KAHL

Point Setting Mechanism

Series: HWU 160

Contents

1	General.....	4
1.1	Address of the Manufacturer / After-Sales Service	4
1.2	Information Sheet	5
1.3	Notes concerning the Operating Instructions	5
1.4	Declaration of Conformity	5
1.5	Operative Range	5
1.6	Your opinion	7
1.7	Key for models.....	8
1.8	Area of application.....	9
1.9	Technical specifications.....	11
2	Safety instructions.....	12
2.1	Symbols used for instructions in this manual	12
2.2	Staff qualification and training	12
2.3	The dangers of non-compliance with safety instructions	13
2.4	Safety-conscious work procedures	13
2.5	Safety instructions for the owner / operator	13
2.6	Safety instructions for servicing, inspection and installation	14
2.7	Unilateral conversion and production of spare parts	14
2.8	Correct and incorrect use	14
3	Transport and storage.....	15
4	Description of product and accessories.....	16
4.1	Earth case	17
4.2	Drive linkage.....	18
4.3	Spring packet	18
4.4	Hydraulic damping	19
4.5	Operating lever box	21
4.6	Mechanical lock.....	22
4.7	Tongue detector	23
5	Installation and adjustment of the Point setting mechanism	25
5.1	Preparation for installation.....	25
5.1.1	Unpacking	25
5.2	Installation and adjustment of the HWU 160	25
5.2.1	Installation in the track body.....	26
5.2.2	Installation and adjustment of the drive linkage and tongue connecting rod	27
5.2.3	Installation and adjustment of the clamp locking device	28
5.2.4	Installation of the tongue detector linkage and adjusting the tongue	35
5.2.5	Adjusting the spring packet.....	36

5.2.6	Adjusting the hydraulic damping	38
5.2.7	Use as a spring point	40
5.2.8	Electrical connection of the tongue detector terminal box	42
6	Commissioning	44
7	Servicing and maintenance	45
8	Troubleshooting	51
9	Appendix.....	52
9.1	Torque specifications M_A in Nm	52
9.2	Required tools	53
10	Appendix: Project and customer-specific documentation	54

1 General

These operating instructions describe HANNING & KAHL point setting mechanisms of the HWU 160 **with force increased spring package**. This series of setting mechanisms is for the manual changing of points.

These instructions provide the reader with detailed information about the **construction** and the **Function** of the point setting mechanism.

The **installation** and **adjustment work** on the setting mechanisms is described.

HANNING & KAHL recommends that certain tasks be carried out at regular intervals in order that trouble-free operation of the systems is assured. These tasks and their intervals are described in the section entitled **Servicing**.

Should there be any malfunctions, the reader will be able to find the components to check and replace in the section entitled **Troubleshooting**.

One prerequisite for performing work on the point setting mechanism is that the user or fitter has studied these operating instructions.

The author has designed these instructions for the attention of skilled workers of the transport company who have been trained as point fitters or electricians.

1.1 Address of the Manufacturer / After-Sales Service

The manufacturer of the point setting mechanisms of series HWU 160 is:

HANNING & KAHL GmbH & Co KG
Rudolf-Diesel-Str. 6
33813 Oerlinghausen

Tel.: +49 (0) 5202 / 70 76 00

Fax.: +49 (0) 5202 / 70 76 29

Email : info@hanning-kahl.com

Internet: www.HANNING-KAHL.com

The service division of HANNING & KAHL can be reached by telephone on +49 (0) 52 02/ 70 76 04.

1.2 Information Sheet

The company HANNING & KAHL constantly tries to improve its products. Therefore, we kindly request you to use the enclosed form (paragraph 1.6) for letting us know your comments with regard to product and operating instructions.

1.3 Notes concerning the Operating Instructions

In case you have any questions concerning these operating instructions please call the number indicated in the header.

The date indicated in the footer refers to the respective state of the documentation.

HANNING & KAHL endeavours to describe the assembly and setting procedure as graphically as possible in project-related operating instructions. However, in many cases, the point setting mechanisms are especially constructed for particular projects and have particular earth cases / setting mechanism housings, rods and electrical connections. Therefore photos and illustrations are not available prior to delivery.

HANNING & KAHL therefore stresses the importance of observing the

- **point installation drawing and the**
 - **corresponding circuit diagram**
- for the particular project on hand.**

1.4 Declaration of Conformity

A declaration of conformity exists and it can be obtained from the manufacturer if required.

1.5 Operative Range

The point setting mechanisms of series HWU 160 are available for Vignol rails points of all profiles.



In general use they are designed for tongue devices with track gauges of 900 to 1581 mm.

Point setting mechanisms of series HWU 160 can be used as change over or spring points. Later conversion from switch to trail function or vice versa can also be done without great effort.

The setting mechanisms also have the option of being fitted with a hydraulic damping system which reduces noise and wear to a minimum.

The manual change devices can be fitted with a mechanical lock to hold point tongues in their end positions.

A tongue detector allows the position of the tongues to electrically ascertained.

In section 1.1 the reader will learn the system by which the key for models is designed and the variations that are available.

Should any part of these operating instructions be difficult to understand or incomplete, we request the reader to inform us accordingly.

Over the course of time each operator of a HANNING & KAHL product gains his own experience regarding the functionality and availability of the equipment. Should you find any faults, please inform of immediately. We are only able to improve and enhance our products if we have feedback from customers.

Section 1.1 contains a form prepared for transmission by mail or fax. Please use it to let us know your opinion about these operating instructions or the product itself.



1.6 Your opinion

Use this form to give us your comments:

HANNING & KAHL GmbH & CO KG

Date:.....

LRT division

Rudolf-Diesel-Str. 6
33813 Oerlinghausen

Telephone: +49 (0) 5202/7076-00
Telefax: +49 (0) 5202/7076-29

My comment:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Name:.....

Company:.....

1.7 Key for models

HWU	40	DV	-	Z	E	
						E Single-tongue point*
						Z With tongue detector
						D With damping*
						DV With damping and single lock (single-tongue point) *
						DVV With damping and double lock (2-tongue point) *
						K With clamp locking device**
						40 Series 40 ***
						160 Series 160 ***
						220 Series 220 ***
						HWU Point setting mechanism for manual operation

*) Series HWU 40 only

**) Series HWU 160 and 220 only

***) Technical features and specifications under sections 1.3 - 1.4

1.8 Area of application

Please note the area of application and correct use of the HWU 160 point setting mechanism from the following table:

HWU 160	HWU 160 D	HWU 160 D-Z	HWU 160 K-D	HWU 160 K-DZ	
X	X	X	X	X	Change over point
X	X	X			Spring point
					Points with <u>one</u> tongue
X	X	X	X	X	Points with <u>two</u> tongues
					Rail profile RI 60
X	X	X	X	X	Rail profile PH 37
X	X	X	X	X	Rail profile S41-49/UIC
60 to 100 mm	60 to 100 mm	60 to 100 mm	to 100 mm ¹⁾	to 100 mm ¹⁾	Tongue path – change over point
60 to 80 mm	60 to 80 mm	60 to 80 mm			Tongue path – spring point
			X (K)	X (K)	Mechanical lock
	X	X	X	X	Hydraulic damping
		X		X	Tongue detector
²⁾	²⁾	²⁾	²⁾	²⁾	Installation height 200 mm
X	X	X	X	X	Installation height 450 mm
X	X	X	X	X	Trailable

Table 1, Application range for HWU 160

¹⁾ – Setting path 160 mm (K) - Clamp locking device

²⁾ – On request

1.9 Technical specifications

Gauge	:	900 - 1581 mm
Tongue contact	:	see table 1
Tongue working surface	:	Application-specific
Tongue detector connection	:	Application-specific
Press force, spring packet	:	approx. 1250 N (max. 3500 N)
Required force for manual switching	:	150..400 Nm
Hydraulic oil for hydraulic damping	:	ESSO Hydraulic oil J32
Circuit board for tongue detector monitoring of end position:		
Operating voltage	:	24 V DC *)
Power intake	:	0,5 A DC **)
Max. switching current	:	2 A DC
Earth case, robust welded construction:		
Can be driven over with axial load of		
	:	12 t
Weights:		
Point setting mechanism compl.	:	approx. 250 kg

*) other voltages (e.g. 12 V DC) on request

**) Without load on output terminals

2 Safety instructions

These operating instructions contain fundamental procedures that must be followed during installation, operation and servicing. They must therefore read by the fitter and operator responsible prior to installation and maintenance, and must always be available at the place the point setting mechanism is used.

Not only the procedures explained in this general section on safety must be followed, but also the specific safety instructions in the other sections too.

2.1 Symbols used for instructions in this manual

Safety instructions in this manual, non-compliance with which can be dangerous to people, are marked with the general danger symbol



Safety symbol from DIN 4844-W9

Electric voltage warnings are specially marked with



Safety symbol from DIN 4844-W8

Safety instructions, non-compliance with which can be dangerous for the equipment and its operation are started with the word

Caution

Instructions mounted directly on the point setting mechanism itself must always be followed and kept legible at all times.

2.2 Staff qualification and training

The staff involved with operation, servicing, inspection and installation must be properly qualified for this work. The areas of responsibility and the monitoring of staff must be properly and precisely defined by the owner. Staff who do not have the appropriate knowledge must receive

the necessary training and instruction. This can be provided by the manufacturer or supplier of the point setting mechanism, if necessary. The owner must ensure on a continuous basis that the operating instructions are fully and properly understood.

2.3 The dangers of non-compliance with safety instructions

Non-compliance with safety instructions may endanger people, the environment and equipment. Non-compliance with safety instructions may disqualify claims against the warranty.

In detail, non-compliance may give rise to the following dangers:

- the failure of major functions of the point setting mechanism
- the failure of prescribed methods of servicing and maintenance
- a risk to people from electrical, mechanical and chemical sources
- a risk to the environment through leakage of hazardous substances.

2.4 Safety-conscious work procedures

Not only the safety instructions contained in this manual but also existing national accident prevention rules and internal work, operating and safety procedures must be complied with.

2.5 Safety instructions for the owner / operator

- Safety guards for moving parts may not be removed when the point setting mechanism is in operation.
- Precautions against the risks of electrical energy must be taken (for details see the VDE rules and those of the local power utility).

2.6 Safety instructions for servicing, inspection and installation

The owner must ensure that servicing, inspection and installation work are performed by qualified and authorised staff who have appropriate knowledge of these operating instructions.

Work on the point setting mechanism may only be performed when the equipment is not under electrical tension. The procedures described in the instructions for cutting off electrical tension must always be complied with.

All safety equipment and protective devices must be re-fitted and/or enabled directly after work is completed.

2.7 Unilateral conversion and production of spare parts

Conversion of or changes to the point setting mechanism may only be made with the express consent of the manufacturer.

Original spare parts and accessories authorised by the manufacturer serve safety. The use of other parts may cancel liability for the consequent results.

2.8 Correct and incorrect use

The operating safety of the point setting mechanism is only assured if it is used correctly, as described in – Section 1 - General – of the operating instructions. The limits stated in the technical specifications may not be exceeded under any circumstances.

3 Transport and storage

Please take account of the relatively heavy weight of the point setting mechanism when transporting it. Only use lifting and hoisting equipment that is suitable for the weight.

When the transport pallet is removed, the drainage connection point is the lowest part of the setting mechanism.

Please note that the drainage connection may be damaged if the setting mechanism is dumped heavily on the ground.

The accessories for the point setting mechanism are inside earth case.

Make sure that the accessories provided are not mixed with accessories for other point setting mechanisms which may be different versions or sizes. Adjustments may otherwise be impossible.

The point setting mechanism is protected against corrosion to the greatest extent.

Avoid exposing the setting mechanism to aggressive atmospheres or to flooding for longer periods of time if you require to store it.

4

Description of product and accessories

The following sections provide a more detailed description of point setting mechanisms from series HWU 160. Not all variations of the setting mechanisms can be illustrated. The illustrations given are intended to show the basic construction and function of the point setting mechanisms.

If there is any deviation from your point setting mechanism, please refer to the respective drawings.

Please refer to the areas of application given in the table in section 1.2 concerning the properties of the setting mechanisms.

The HWU 160 point setting mechanism is a mechanism for manually setting the point tongues of a 2-tongue point. It is designed for installation in a tongue device with a PH 37 and S41-49(UIC) rail profile.

As a switching point the maximum tongue path is 120 mm.

The HWU 160 point setting mechanism can also be supplied as or converted to be a spring point. In this case the maximum tongue path is 80 mm.

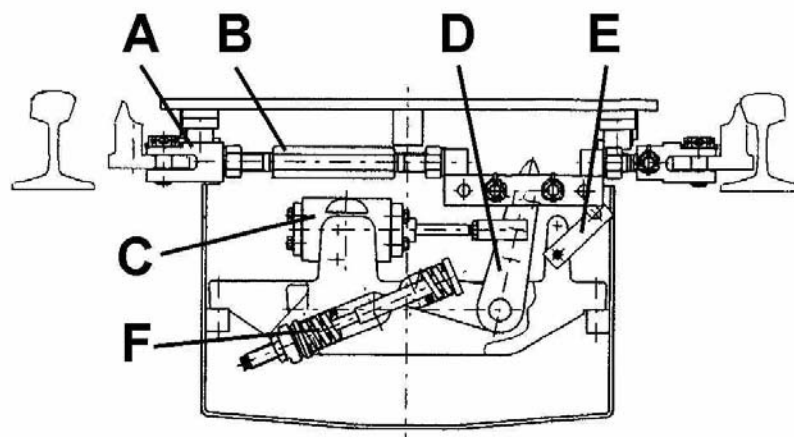


Fig. 1, HWU 160 D (cross-section through the drive linkage from the front)

Legend:

- A = Tongue working surface
- B = Tongue connecting rod and tongue drive rod
- C = Hydraulic damping
- D = Switch lever
- E = Central locking
- F = Spring packet

The HWU 160 point setting mechanism can be fitted with a locking device in order to hold set point tongues in place.

This lock takes the form of a clamp locking device. The tongue path is then 100 mm.

The properties of the series HWU 160 point setting mechanism are similar to those of the HWU 40. The frame built into the housing, including the assemblies, is identical. Only the tongue connecting rod and the tongue working surfaces are different.

The earth case is adapted for the rail profile and the tongue path.

The earth case of the point setting mechanism is a robust welded construction connected by contacts to the adjacent sleepers.

The point setting mechanisms shown in Figs. 1 and 2 are trailable. The point tongues are not mechanically locked in their end positions.

A spring packet, the pre-tension of which can be adjusted, generates the holding power to keep the point tongues in their end position.

Adjustable hydraulic damping reduces noise and wear to a minimum.

A slot in the earth case lid allows access to the operating lever box, which passes on the switching power via the switch lever to the tongue connecting rod.

The point setting mechanism can be supplied as a change over or spring point according to the customer's requirement. But any point setting mechanism from series HWU 160 can quickly be converted from one type to the other.

4.1 Earth case

A welded earth case accommodates the components of the point setting mechanism. Its base contact points lie on the lateral sleepers. The point setting mechanism is bolted firmly to the sleeper through the base contact points.

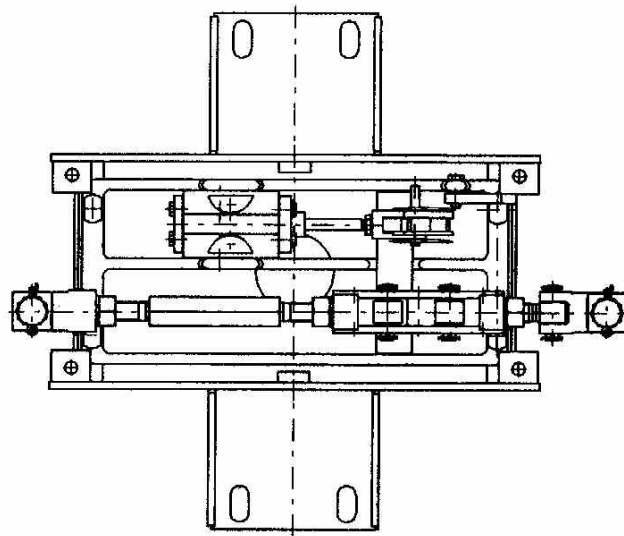


Fig. 2, HWU 160 D (top view)

The earth case is covered by a sturdy lid fixed in place by 4 screws.

The point setting mechanism shown in Figs. 1 and 2 has no mechanical lock for the point tongues. There is no tongue detector to ascertain the end position of the tongues.

4.2 Drive linkage

The drive linkage in the non-mechanically locked version is in principle a tongue connecting rod. The tongue working surface in this case is designed as a connecting fork that makes the connection from the point tongue to the tongue connecting rod (see Fig. 1).

If the point tongue requires to be fixed or locked in position with the HWU 160 point setting mechanism, a clamp locking device is used. With this variation the sliding rod connects the point tongues together with the locking clamps (see Fig. 7 in Section 4.6).

4.3 Spring packet

The spring packet of the HWU 160 is mounted on the switch lever of the setting mechanism and consists of one screw springs C, that are pre-tensioned between spring plates B and F.

See Fig. 3 for further information.

The task of a spring packet is to press the contacting point tongue with a defined force against the rail to ensure that the point tongue is not displaced when driven over.

The required spring force at the tongue connecting rod is $>1000\text{N}$ which must be adjusted during commissioning.

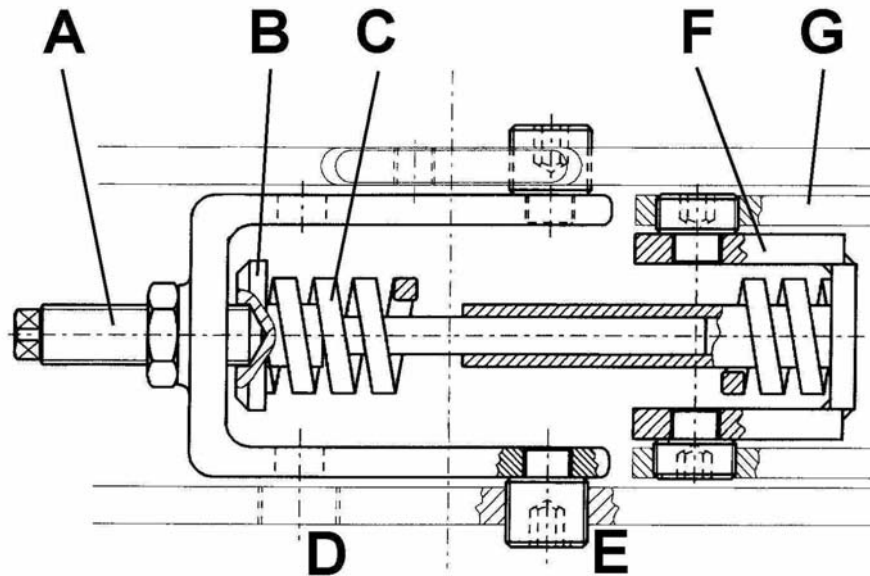


Fig. 3, Spring packet

The spring packet is connected via yoke G to the switch lever. The force acts through the tongue connecting rod on the point tongues and arrests them in their end positions. If the force of the spring packet is not correct, the pre-tension force of the spring can be adjusted by turning adjustment spindle A.

In point setting mechanisms with a switching function the spring packet is borne in bore E. Bore D is used if the point setting mechanism is used as a trailable device.

The stirrup bearing has service-free teflon bushings.

4.4 Hydraulic damping

The HWU 160 point setting mechanism can be equipped with hydraulic damping. This damping device prevents loud noise during the switching process and also wear through heavy banging of the point tongues.

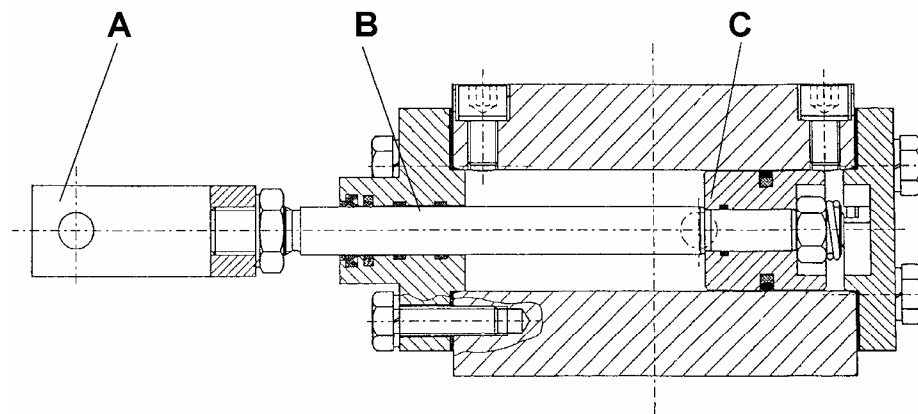


Fig. 4, hydraulic damping (Longitudinal section)

Legend:

A = Switch lever connection

B = Piston rod

C = Piston rod

The hydraulic damping is connected via connection A to the switch lever. Piston rod B connects connection A to piston C.

The damping intensity can be adjusted independently in both directions.

An ideally adjusted hydraulic damping reduces wear and noise during the switching process to a minimum.

The hydraulic damping is filled with hydraulic oil.

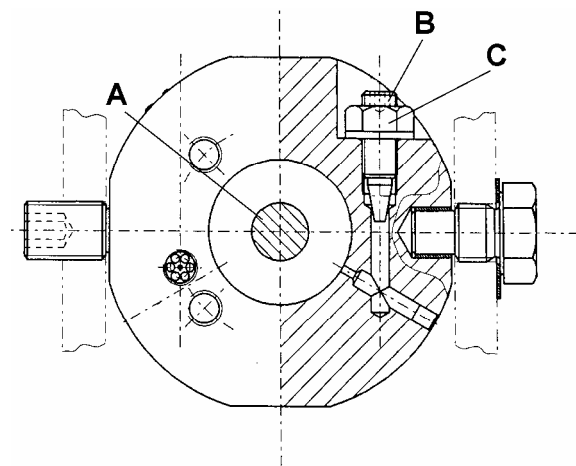


Fig. 5, hydraulic damping (cross section)

During the switching process the damping piston C, Fig. 4 presses the hydraulic oil through the internal channels of the housing. Adjustment of the two set screws B, Fig. 5 changes the flow speed of the hydraulic oil. Changing the flow speed means changing the damping intensity.

Backing nut C, Fig. 5 ensures that no adjustment can take place unless intended.

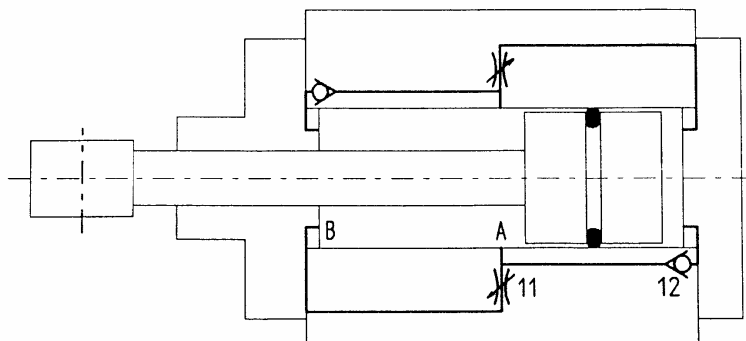


Fig. 6, Circuit diagram of the hydraulic damping

From the point end position the damping piston moves and the hydraulic oil flows through aperture A, Fig. 6 and through the non-return valve into the chamber behind the damping piston. This sequence of movement occurs without damping effect. As soon as the damping piston closes aperture A during its movement the hydraulic oil flows through aperture B, through the adjustable throttle and through the non-return valve into the chamber behind the damping piston.

The damping only takes effect after the first half of the tongue path has been crossed.

The hydraulic damping is in a mobile mounting in a support base with two shank screws. Its cylindrical ends are in the bore in the housing of the hydraulic damping device. These bores contain service-free, teflon-coated bearing bushings.

4.5 Operating lever box

The operating lever box accommodates the switching lever with which the point setting mechanism can be manually switched.

The operating lever box on the HWU 160 point setting mechanism is installed parallel to the switch lever on the drive shaft.

The socket for the switching lever is designed to accommodate the levers used by the respective transport company.

4.6 Mechanical lock

The HWU 160 K-D variation meets the requirements for a locked point. A clamp locking device ensures that the point tongue engaged is held firmly in its end position.

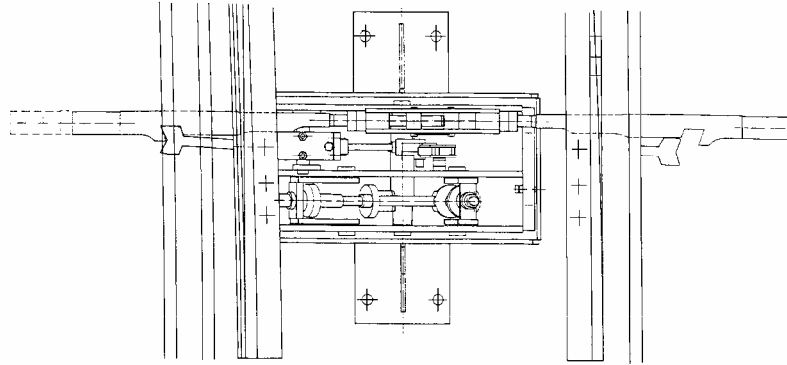


Fig. 7, HWU 160 K-D

Fig. 7 show the HWU 160 K-D variation with clamp locking device.

The right point tongue, contacting the rail at the outside, is fixed in place. The point tongue cannot be displaced if the point is driven over. The left point tongue is not touched when the point is driven over. It is not fixed in place.

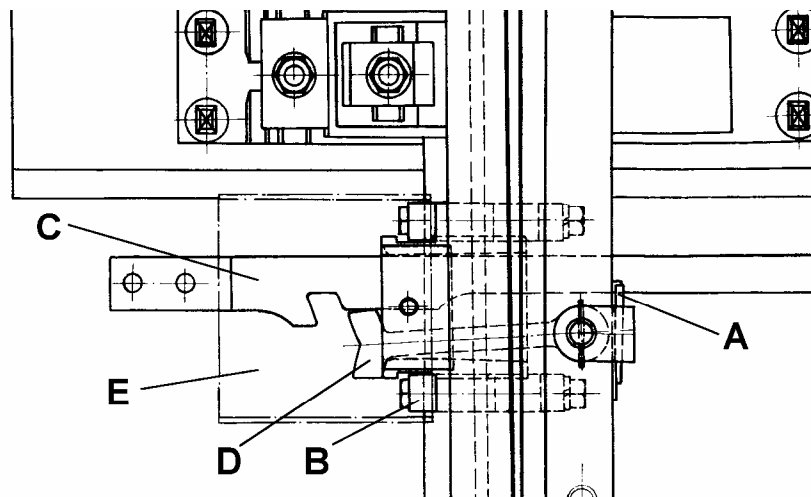


Fig. 8, Clamp locking device, links (fixed point tongue)

Legend:

- A = Compensating wedge with plate
- B = Locking element
- C = Sliding rod
- D = Locking clamp
- E = Protective cover

Fig. 8 shows the part of the clamp locking device that holds the point tongue in place. Locking clamp D is connected to the point tongue and is located next to the sliding rod outside locking element B. The sliding rod is in a position in which it prevents the locking clamp from being moved into the locking element, i.e., the point tongue connected to the locking clamp is fixed in place.

During the switching process only the sliding rod moves to the right at first. After moving some 40-60 mm (covering) the locking clamp falls into the recess provided in the sliding rod. In this position the sliding rod and the locking clamp can be guided together into the locking element at the same time. Both parts move in this way until the new point end position is reached (see Fig. 9).

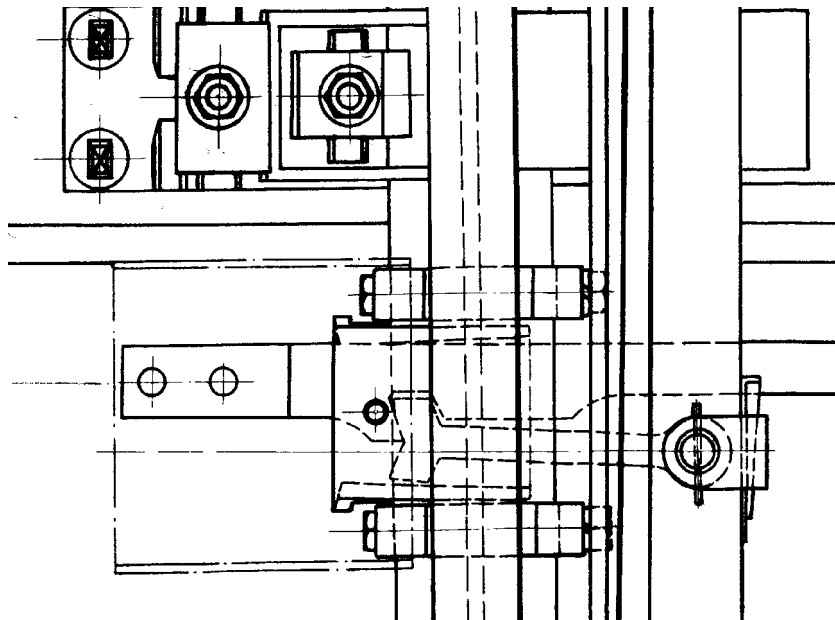


Fig. 9, Clamp locking device, links (point tongue not fixed)

4.7 Tongue detector

Fig. 10 shows a point setting mechanism HWU 160 D with tongue detector.

If there is a requirement to integrate an HWU 160 manual point setting mechanism, e.g., in a depot control system, it is possible to add a tongue detector.

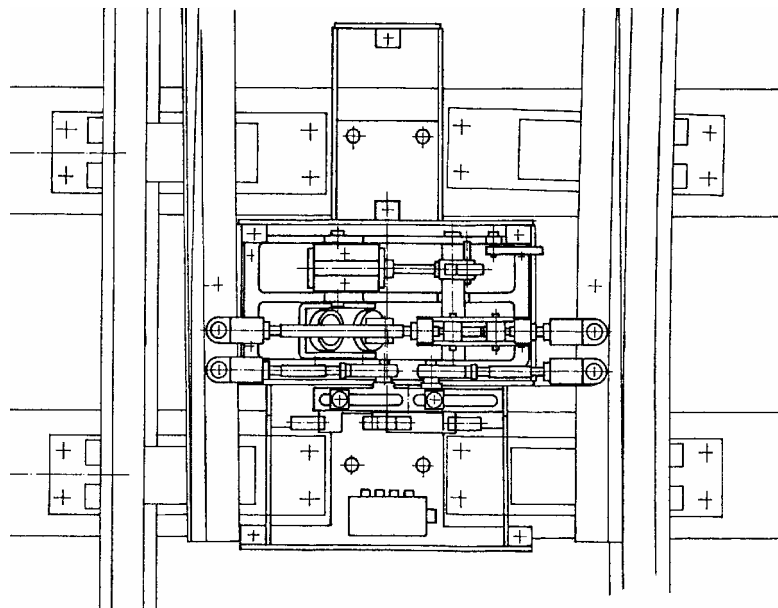


Fig. 10, HWU 160 DZ

The tongue detector is located in a small ancillary box on the sleeper.

The tongue detector constantly monitors the position of the point tongues.

It consists in principle of two movable guide elements which are independent of each other. These two guide elements are joined by connecting forks to the point tongues and are moved exclusively by these.

The actuating cams are mounted on the guide elements. In the end positions the actuations move closer to the respective inductive proximity switches and switch them on.

The inductive proximity switches are connected to an analysis circuit board located in the tongue detector terminal box.

It is possible to electrically evaluate the pint end positions.

There are various possibilities of connecting the tongue detector to an electrical system.

Two examples:

- 1) The DC 24 V (DC 12V) operating voltage of the analysis circuit board can be taken at two output terminals in order to start a switching process in the control.
- 2) The circuit boards are programmed so that potential-free contacts switch an externally supplied voltage.

5 Installation and adjustment of the Point setting mechanism

5.1 Preparation for installation

These instructions describe installation and commissioning of the HWU 160 point setting mechanism.

It is essential to read these instructions in order to ensure safe installation and commissioning. Any sequence of installation or method operation different to that described here is dangerous.

5.1.1 Unpacking

The packaging material of the point setting mechanism should be disposed of in a responsible manner.

Slacken the fastening screws and take off the earth case lid.

The following accessories are inside the earth case:

- Tongue connecting rod and sliding rod of the clamp locking device
- Drainage channels
- Tongue detector linkage)

Take these parts out of the earth case and put them in a place where they are safe from damage.

5.2 Installation and adjustment of the HWU 160

Installation and adjustment of the HWU 160 can vary, depending on whether it has a clamp locking device. The differences are highlighted in the following sections.

Note the descriptions:

HWU 160 D – without clamp locking device, with damping

HWU 160 K-D - with clamp locking device, with damping

5.2.1 Installation in the track body

To ensure that the point setting mechanism is suitable for installation at the respective location, check the relevant dimensions of the earth case and tongue device and the functional properties of the point setting mechanism prior to installation.

HWU 160 D:

Use the following sequence when installing the earth case:

- a) Insert the earth case and position it so that the working surfaces of the point tongue are aligned with the tongue connecting rod and the switch lever of the HWU 160. The earth case must be installed centrally between the rails.

A tolerance of ± 2 mm is allowed.

- b) Screw the point setting mechanism to the sleepers with the contacts.
- c) Connect earth case to the drainage via the drainage point.

HWU 160 K-D:

The appropriate installation drawing is always required when installing an HWU 160 in the tongue device.

HWU 160 K-D point setting mechanisms can be supplied with clamp locking devices of varying types of from different manufacturers.

Proceed with the following sequence bearing these points in mind:

- a) Place the earth case in the tongue device.
- b) Take from the installation drawing the dimension that fixes the reference between one side of the earth case and the connection point for the locking clamp. Note dimension Y in Fig. 11. Align the earth case according to this dimension.
- c) Position the earth case centrally between the rails.

A tolerance of ± 2 mm is allowed.

- d) Make sure that the top edge of the earth case is flush with the top edge of the rail.
- e) Screw the point setting mechanism with the contacts to the sleepers.

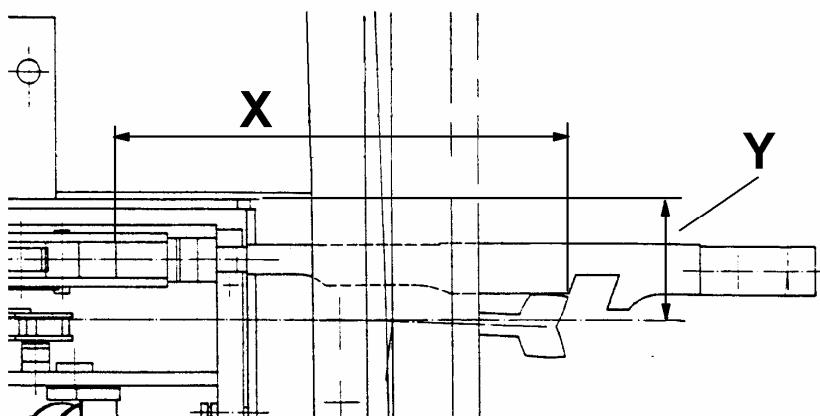


Fig. 11, HWU 160 K-D, Reference dimensions for installing the earth case and parts of the clamp locking device

5.2.2 Installation and adjustment of the drive linkage and tongue connecting rod

HWU 160 D:

The tongue connection linkage is already in the installed condition on delivery.

Bring the point setting mechanism into a central position using the central locking.

The switch lever protrudes from the connector piece between the two guide rolls.

Make the connection between the tongue working surfaces and the point tongues.

On the tongue connecting rod shown in Fig. 12 the working surfaces take the form of connecting forks. A bolt secured with a splint makes the connection.

With the point setting mechanism in the central position, turn the two adjustment spindles until both point tongues are at distance from the rails corresponding to half the tongue path.

A square tool can be used to turn the adjustment spindles.

Slacken the central locking and bring the point setting mechanism into an end position.

Check in both point end positions whether the respective outer point tongue is in close contact.

Correct the spindle setting if necessary.

Use Fig. 12 for performing adjustment work.

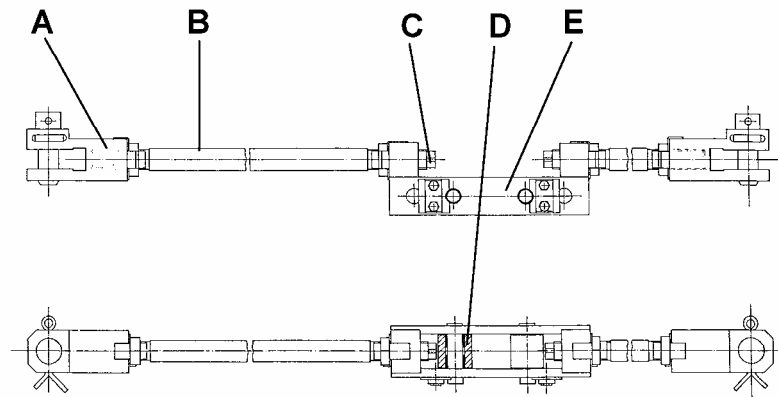


Fig. 12, HWU 160, Tongue connecting rod

Legend:

- A = Tongue working surface
- B = Adjustment spindle
- C = Square
- D = Guide roller
- E = Connector

After completing the adjustments that check all screw and bolt connections of the tongue connecting rod are tight and properly secured (securing plate).

5.2.3 Installation and adjustment of the clamp locking device

HWU 160 K-D:

To install the components of the clamp locking device the earth case must first be properly installed with the aid of the installation drawing.

Fig. 13 shows the components of a clamp locking device in an assembled state.

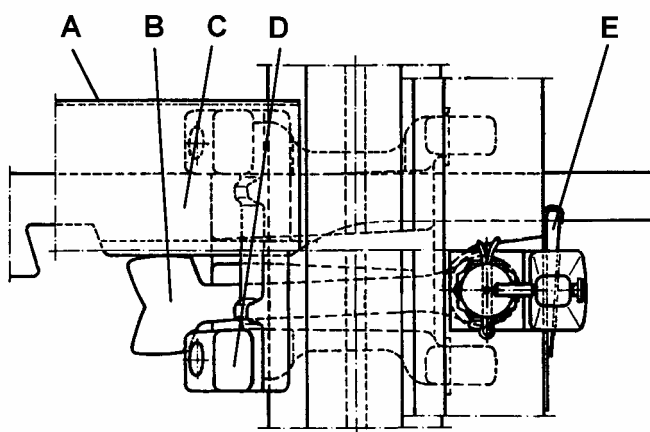


Fig. 13, Clamp locking device (top view)

Legend:

- A = Safety cover
- B = Locking clamp
- C = Slide rod
- D = Locking element
- E = Compensating wedge

It must be re-emphasised at this point that components shown in Fig. 13 are only examples. The actual clamp locking devices supplied may be of a different type or from another manufacturer!

Please refer to the installation drawing for your point setting mechanism.

Screw one slide rod of the clamp locking device into the connector at one side.

Screw it in to the extent shown in the installation drawing.

Note dimension X in Fig. 11.

Now install the locking clamp.

Note the dimension of the fastening bore in the point tongue.

Depending on the type of clamp locking device and tongue connection it may be necessary to insert a bushing (Walter bushing) into the bore at the foot of the tongue.

If required, the Walter bushing must be driven into the 32 mm bore at the foot of the tongue. Fig. 14 shows the shape and dimensions of the Walter bushing.

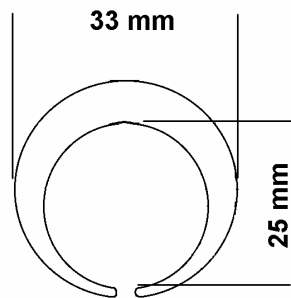


Fig. 14, Walter bushing

The Walter bushing is made of spring steel. The centre point of the 25 mm inside diameter is offset by approx. 2,5 mm relative to the outer diameter. Turning the Walter bushing allows wear on the locking piece or the locking clamp to be compensated to a certain extent.

A worn out Walter bushing can be replaced by another without difficulty. This prevents wear to the tongue foot.

Refer to Figs. 15 and 16 when installing the locking clamp.

Bring the locking clamp into position and screw locking clamp screw B from above into tongue block D.

Secure the locking clamp screw with a backing plate and splint.

Use the securing pin C with splint also.

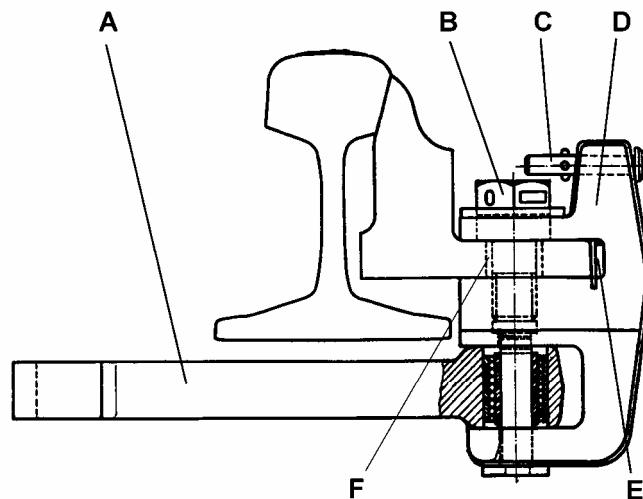


Fig. 15, Clamp locking device, clamp lock, tongue block.

Legend:

- A = Locking clamp
- B = Locking clamp screw with backing plate
- C = Securing pin with splint
- D = Tongue block
- E = Wedge with backing plate
- F = Walter bushing

After installing the locking clamp screw and the securing elements, the tongue block must be fixed to the tongue foot.

Place the backing plate with wedge in the opening between the tongue foot and the block.

Knock the wedge firmly in.

Secure the wedge by knocking the backing plate round the wedge (see Fig. 16).

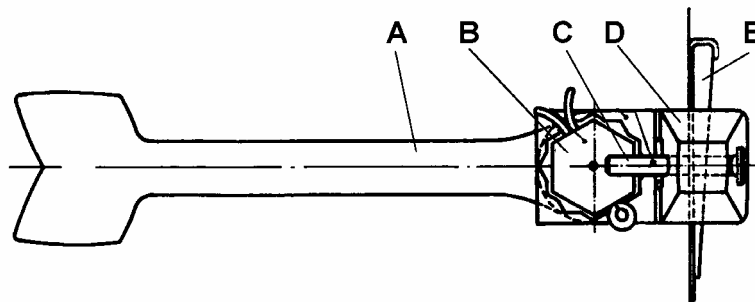


Fig. 16, Clamp locking device, locking clamp, tongue block (top view)

The locking elements may differ, depending on the type and manufacturer.

Fig. 17 shows the version with two bolts screws to the rail bar. With this version it is necessary to prepare two bores through the rail bar. Later lateral adjustment of the locking element is no longer possible.

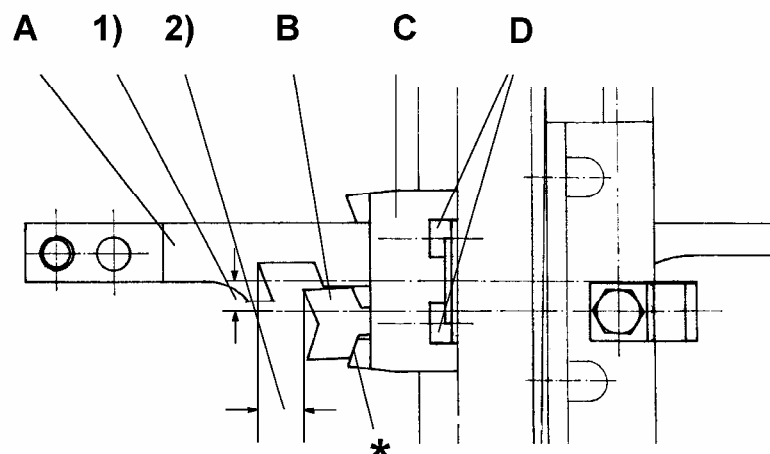


Fig. 17, Clamp locking device, locking element I, (top view)

Legend:

- A = Sliding rod
- B = Locking clamp
- C = Locking element
- D = Bolt
- 1 and 2) = Dimension, see text

The installation position of the locking element is shown with dimensions in the installation drawing.

Note in particular the following dimensions:

- 1) The space between the middle line of the locking element passageway and the middle point of the locking clamp screw,
- 2) Covering between sliding rod and locking clamp,
- 3) The space between the rail foot and the centre point of the fastening bores for the locking element,

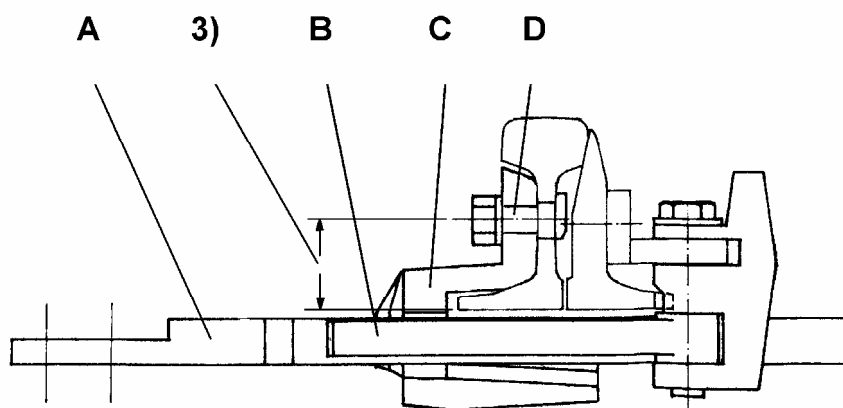


Fig. 18, Clamp locking device, locking element I (side view)

Legend:

- A = Sliding rod
- B = Locking clamp
- C = Locking element
- D = Bolt
- 3) = Dimension, see text

To install the locking element, bring sliding rod A into a position where locking clamp B drops into the recess of the sliding rod.

In this position, slide locking element C over the sliding rod until it contacts the rail bar.

Screw the locking element tightly with both bolts D.

Make sure that the point tongue does not hit the bolts D.

Secure the nuts with the backing plate and splint.

Now install the other clamp locking device on the other side of the point.

Now operate the point setting mechanism with a switch lever.

The sliding rod now moves out of the locking element in the direction of the switch. The point tongue hits rail. The sliding rod moves further and

presses the locking clamp to the side. The sliding rod continues to move until the contact point of the rod hits the rail foot.

The locking clamp is in a position where one of its oblique flanks is lying on the locking element. The sliding rod presses the locking clamp into this position. If the locking clamp does not move cleanly out of the locking element during the switching process, material may be ground off the flank of the locking element and the locking clamp.

See the marking - * - in Fig. 17.

Grease the parts of the clamp locking device.

Wear on the contact surfaces between the locking clamp and locking element can be compensated by fitting compensating plates between the locking element and the rail bar.

Fig. 19 shows a version of the locking element that must be clamped to the rail foot. The clamp fastening consists of 1 - 2 pressure screws with backing nut and an insertable clamp piece. In this version the locking element can be slid to the side during installation.

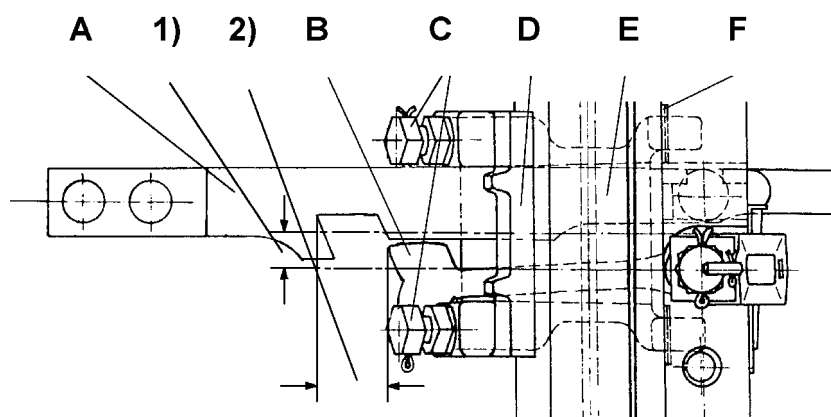


Fig. 19, Clamp locking device, locking element II (top view)

Here too, refer to the installation position of the locking element with dimensions shown in the installation drawing.

Note in particular the following dimensions:

- 1) The space between the middle line of the locking element passageway and the middle point of the locking clamp screw,
- 2) The covering between the sliding rod and locking clamp,

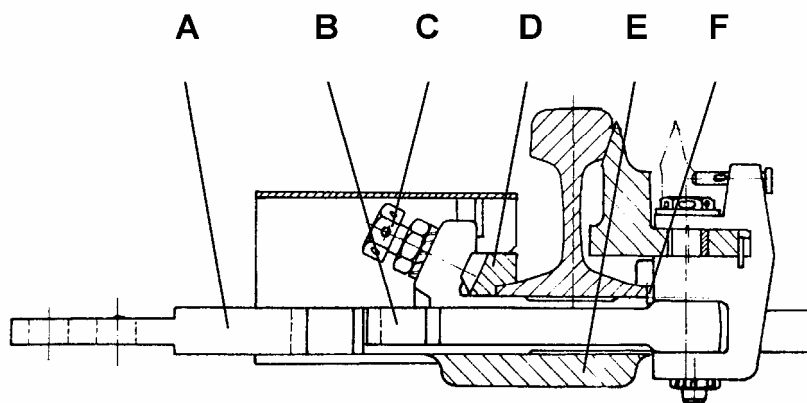


Fig. 20, Clamp locking device, locking element II (side view)

Bring the sliding rod A again into a position where the locking clamp B drops into the recess of the rod.

In this position, slide the locking element E over the sliding rod until it touches the rail bar.

Insert the 2 and 3 mm plates and hook the locking element to the rail foot.

Insert clamping piece D and clamp it tightly using the pressure screws C, backing nuts and securing plate.

Position the locking element as shown in the installation drawing (space between the middle line of the locking element passageway and the centre point of the locking clamp screw).

Screw in the pressure screws first and then tighten the backing nuts.

Secure the pressure screws with the splint.

Install the other clamp locking device on the other side of the point.

Now operate the point setting mechanism using a switch lever.

The sliding rod now moves out of the locking element in the direction of the switch. The point tongue hits rail. The sliding rod moves further and presses the locking clamp to the side. The sliding rod continues to move until the contact point of the rod hits the rail foot.

The locking clamp is in a position where one of its oblique flanks is lying on the locking element. The sliding rod presses the locking clamp into this position. If the locking clamp does not move cleanly out of the locking element during the switching process, material may be ground off the flank of the locking element and the locking clamp.

Grease the parts of the clamp locking device.

Wear on the contact surfaces between the locking clamp and locking element can be compensated by fitting compensating plates between the locking element and the rail bar.

5.2.4 Installation of the tongue detector linkage and adjusting the tongue detectors

Fig. 21 shows the tongue detector of an HWU 160 D-Z. the tongue detector consists of two guide elements D, that are connected by the tongue detector linkage to the point tongues.

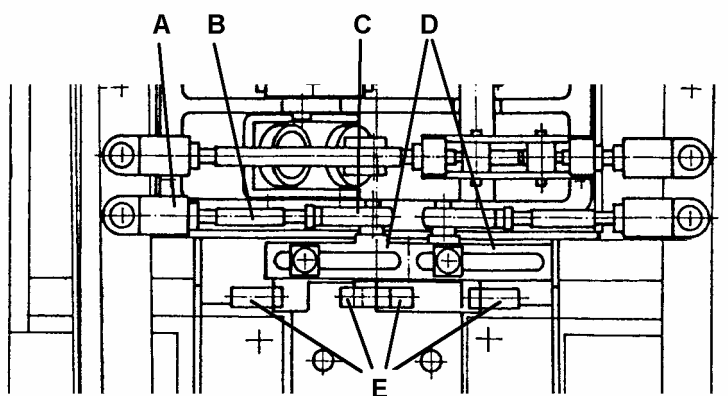


Fig. 21, Tongue detector HWU 160 D-Z

Legend:

- A = Tongue working surface
- B = Adjusting spindle
- C = Ball joint
- D = Guide elements
- E = Inductive proximity switch

The following section describes how to adjust the tongue detector linkage and the inductive proximity switch:

Slacken the tongue detector linkage from the guide elements.

Connect the connecting fork of the detector linkage to the point tongues.

Now place the ball joint on the bolt of the guide element and secure it with the splint.

The ball joint and the connecting fork have an inside right and left thread. The effective length of the tongue detector linkage can be increased by turning the adjusting spindle.

Turn the adjusting spindle or push the respective guide element in order to connect tongue detector linkage with the guide element.



With the tongue detector linkage installed, the length of the linkage must now be adapted for the tongue device.

Note the position of the top guide element in relation to the fixed guide block.

Change the setting of the adjustment spindle until the top guide element makes the same path to the right and left in both point positions.

The remaining length of the slot in the guide element right (point position left) and left (point position right) on the guide element must be the same.

Now change the adjustment spindle of the bottom guide element.

It is correctly adjusted when both guide elements are flush from top to bottom (one over the other).

Tighten the respective backing nuts and secure them.

To adjust the inductive proximity switch the tongue detector terminal box must first be connected to the control unit.

Switch on the voltage supply and watch the light diodes of the inductive proximity switch.

Bring the point setting mechanism into an end position put a 3 mm plate between the point tongue and the rail.

The actuating cams on the guide elements of the tongue detectors move closer towards the sensor surface of two inductive proximity switches.

Slacken the fastenings of the inductive proximity switch.

Slide it towards the actuation cam until the light diode signals: "ON".

Screw the inductive proximity switch tight.

Replace the 3 mm plate with a 4 mm plate.

The light diodes of the previously adjusted inductive proximity switch must now signal: "OFF".

Repeat this procedure for the other two inductive proximity switches for the other point end position.

5.2.5 Adjusting the spring packet

The linkage spring assemblies are already pre-adjusted by the factory.

Safety indication!

Observe the following concerning the linkage spring assemblies when setting the point setting mechanism manually: The linkage spring assemblies transfer forces to the inner components of the connected points tongues in each points position.



There is danger of squashing limbs in the area of the earth case, e.g. in the windings of the spring assemblies and in the points tongues area.

Instruct the surrounding persons to stop working and to remove the tools from the housing and the points tongue area during the setting process.

Due to influences of the switching devices respectively the points (stiffness of the tongues, friction of the tongue support structure, etc.) a readjustment of the linkage spring assembly might be required on site. A readjustment is required when the pressure exerted by the tongues in final position is too low.

Checking the closing of the tongues:

Place a 4 mm plate between the tip of the tongue and the stock rail. As soon as the plate is pulled out in upward direction the tongue must fall into its final position due to the spring force of the linkage spring assembly and the tip of the tongue must be tightly closed at the stock rail.

If the tip of the tongue can still be pressed further towards the stock rail, e.g. by means of the hand lever, a readjustment of the linkage spring assembly and possibly also an alignment of the tongue is required.

The following text explains the readjustment of the linkage spring assembly.

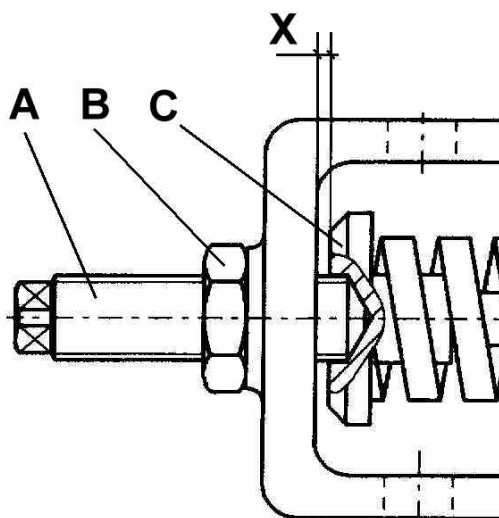


Fig. 22, Dimension X , Spring packet

To change the spring force, slacken the backing nut B and turn adjustment bolt A.

Turn to the right to increase the pre-tensioning of the spring, and turn to the left to reduce it.

Secure the setting again with backing nut B.

5.2.6 Adjusting the hydraulic damping

The final part of the adjustment work consists of checking and adjusting the damping effect.

The hydraulic damping of the HWU 160 D is pre-adjusted at the factory.

It must be re-adjusted if the point tongues bang audibly when the point is switched.

The intensity of damping can be changed for each individual direction of movement.

To check the damping intensity the point setting mechanism must be manually switched or, if the point is used as a spring point, it must be driven over by a rail vehicle.

HANNING & KAHL hydraulic point setting mechanisms, electro-magnetic point setting mechanisms and manual setting equipment are operated with a special hydraulic oil that is ideal for this application. The hydraulic oil in use, as with other oils, is not without risk for the **environment** and must be handled accordingly.



Do not allow hydraulic oil to enter the soil!

Use an oil catch pan!

Clean up immediately any hydraulic oil that has flowed onto the floor.

People may otherwise slip on it!

Use oil absorbers!

Avoid naked flame!

Wear safety goggles and gloves!

Dispose of old and recovered oil responsibly!

Check the oil level and top up with hydraulic oil if necessary.

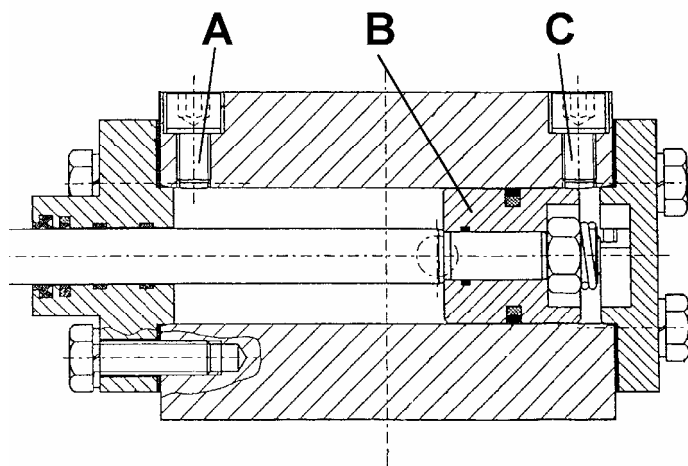


Fig. 23, Hydraulic damping, check oil level

To top up or fill up with damping fluid first bring piston B into the position shown in Fig. 23.

This corresponds to the status in which the piston is submersed in the damping case.

Unscrew screws A and C.

Fill hydraulic oil into the filler aperture A until it reaches the bottom edge of aperture C. Slacken the backing nut and turn the adjustment screw 1 - 2 turns to the left to speed up the filling process.

Refit screws A and C after filling the oil.

If the adjustment screw is moved when the damping is being filled, the damping will need to be re-adjusted.

Screws C and D must be re-tightened.

The procedure for adjustment is described below:

Ascertain the direction in which the point tongue bangs audibly.

It is marked on the case of the damping which screw must be turned to adjust the damping effect for a particular direction of movement.

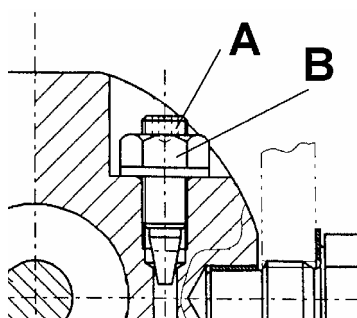


Fig. 24, Hydraulic damping, adjustment screw

Slacken backing nut B.

Turn the appropriate adjustment screw A.

Adjustment screw A should be turned in increments of $\frac{1}{4}$ - turn at a time.

Turn the adjustment screw to the right to increase the damping effect, and to the left to reduce it.

After each adjustment the adjustment screw must be secured again with backing nut B.

Switch the point setting mechanism after each change of the adjustment screw and check the damping effect.

The damping is correctly adjusted when the point tongues move into their end positions without audible banging.

5.2.7 Use as a spring point

Fig. 25 shows the HWU 160 D being used as a point setting mechanism in a change over point. In this application the guide rollers of the tongue connecting rod must be fitted to the inside positions (C).

The damping must be installed in the "top" position on the frame as shown and to the switch lever (B).

Correspondingly, the spring packet is installed in the "bottom" position (A).

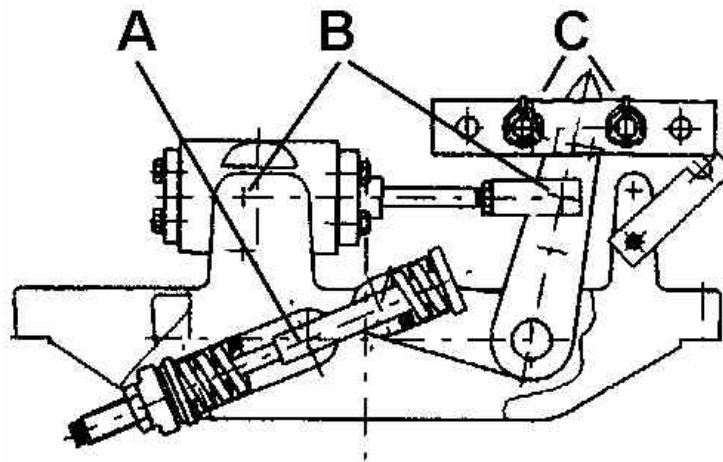


Fig. 25, HWU 160 as change over point

When the point setting mechanisms to be used in a spring point, the guide rollers must be fitted to the outer positions, as shown in Fig. 26 (C).

Even when the point setting mechanisms used in a spring point the point can be trailed.

Additionally, the damping must be brought from the "top" into the "bottom" installation position (B) and the spring packet from the "bottom" into the "top" installation position (A).

This conversion is shown in Fig. 26.

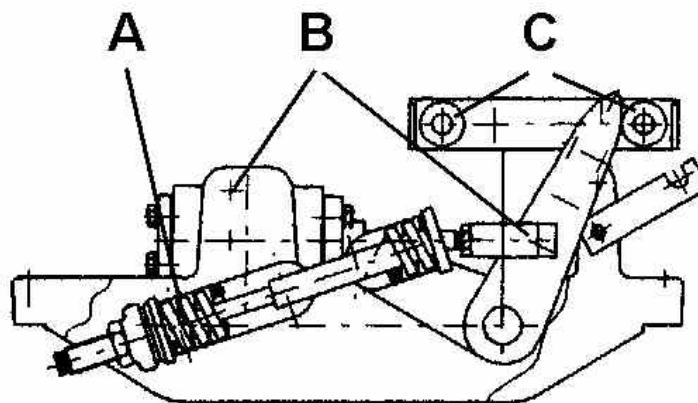


Fig. 26, HWU 160 as spring point

5.2.8 Electrical connection of the tongue detector terminal box

When electrically connecting the tongue detector terminal box the cable used must be suitable for underground laying.

Now connect the control voltage cable with the tongue detector terminal box.

There are various ways of connecting the point setting mechanism to the tongue detector terminal box:

Example 1) 24 V DC (12 V DC) voltage supply for the inductive proximity switch,
24 V DC (12 V DC) as control voltage for detecting the point end position

Note in this case the following terminal designations:

- A - Operating voltage (-);
- B - Operating voltage (+);
- E - Outlet ZP left;
- F - Outlet ZP right

See Fig. 27.

This shows a sticker found in the lid of the tongue detector terminal box .

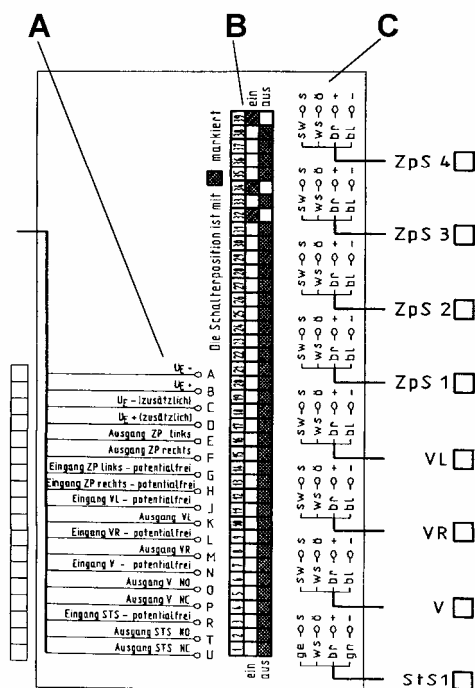


Fig. 27, Tongue detector terminal box, sticker

Note the connection terminals for the inductive proximity switches A, the coding switches B and the connection terminals for the voltage supply and Outlet C.

The sticker shown in the figure is only an example, please see the sticker that is on the lid of the tongue detector terminal box of your Point setting mechanism.

Tongue detector terminal boxes and their circuit boards are the same in different versions of the point setting mechanism. The difference lies in the position of the coding switches. The sticker describes the position of these coding switches.

- 2.) DC 24 V (12 V DC) Voltage supply for the inductive proximity switches,
Use of potential-free contacts for displaying the
Point end position etc.

Connect the control voltage with:

R = Operating lever box switch

L + J = Drive lock monitor

G + H = Tongue detector LEFT + RIGHT

Connect the outlets with:

U + T = Operating lever box switch (alternating contact)

K + M = Drive lock monitor

E + F = Tongue detector LEFT + RIGHT

Refer again to the sticker in the lid of the tongue detector terminal box for the position of the coding switches.



Caution!

There may be dangerous voltage levels in the connection terminals for the voltage supply cable in the point setting mechanism. Do not perform any work while the equipment is under tension. Make sure that the point setting mechanism is switched off while work is being carried out.

6 Commissioning

After successful installation and adjustment the following points must be re-checked:

- The point tongues must lie properly in their end positions (correct adjustment of the tongue connecting rod, drive linkage, clamp locking device);
- The point must be able to be switched without tongues banging (correct adjustment of the hydraulic damping);
- The point tongues must move properly from the middle into an end position and be held in place (correct adjustment of the spring packet);
- All screw-type connections must be tight, and secured where necessary.

7

Servicing and maintenance

To guarantee correct operation for years ahead, it is essential that certain checks and tasks are carried out on a regular basis.

The intervals specified in this section are 6 months, 12 months and 5 - 10 years. **These specifications are recommendations from HANNING & KAHL.** They have been worked out from the safety rules, BOStrab and VDV literature. Practical experience from transport companies has, of course, also been taken into account.

However, local conditions for individual companies may be different, and operators may need to change these intervals if the need arises. Heavy or light soiling, or frequent or infrequent use may be very good reasons to change the servicing intervals.

The recommendations for servicing and maintenance in the following sections are based a normal switching frequency of approx. 180 000 point switching operations per year.

The column entitled "Tasks to do" is divided into several sections, each referring to individual assemblies. The user must find the sections relevant to the assemblies in his point setting mechanism.

HANNING & KAHL is grateful to every operator who gives feedback on his wishes and experience, since this improves the technical information.

Section 1.1 of these operating instructions contains a form prepared for sending by fax or mail.

Please use this form and let us know your experience concerning servicing and maintenance!

Are there intervals that should be changed in principle, or are there any additional tasks that should be included?

Tasks to do		6 Mon.	12 Mon.	5 - 10 years	Remarks
7.1	Earth case				
	Check lid fastening screws are tight.	X			
	Check fastening nuts on earth case are tight.		X		
	Remove dirt from inside earth case	X			At shorter intervals if necessary. Flush with water.
	Check drainage and clean if necessary	X			At shorter intervals if necessary. Clear drain pipe with water pressure.
	Check inside of earth case for corrosion, clean away rust if necessary and repaint.			X	Primer: Rust and adhesive primer, black. Paint: Inertol 1

Tasks to do	6 Mon.	12 Mon	5 - 10 years	Remarks
7.2 Switching mechanism				
Check that fastening screws of assembly are tight.		X		Note correct torque!
Check the setting of the spring packet .	X			See adjustment instructions.
Check the tightness and setting of the damping .	X			See adjustment instructions.
Check the setting of the tongue connecting rod (effective length).		X		
Check all wearing parts in the locking mechanism (HWU 160)			X	In a general overhaul.
Check all teflon bushings in the bearing points of the individual assemblies.			X	In a general overhaul.
Check the setting and condition of the drive lock . Lubricate parts if necessary.	X			See adjustment instructions
Tasks to do	6 Mon.	12 Mon.	5 - 10 years	Remarks

Check the setting of switch spacings for the inductive proximity switches of the **drive lock monitor**.

X

See adjustment instructions

Check the setting of switch spacings for the **tongue detector end position monitor**.

X

See adjustment instructions.

7.3 Linkage

Check screw connection between the tongue connecting rod and the point tongues and tighten if necessary

X

Check the components securing the tongue connecting rod and tighten if necessary.

X

Check the components securing the hammer head screws.

X

Tasks to do		6 Mon.	12 Mon.	5 - 10 years	Remarks
7.4 Clamp locking device					
Check the dimensions and settings in around the clamp locking device.			X		See adjustment instructions
Check the position of the respective closed and open point tongues.			X		See adjustment instructions
Check the operation of the clamp locking device and lubricate it.		Every 2 months			

Tasks to do		6 Mon.	12 Mon.	5 - 10 years	Remarks
7.5	Connection terminal boxes				
	Clean terminal boxes and check for corrosion.		X		If there is water inside the terminal box the seals of the case must be checked.
7.6	Connection cable				
	Check terminal connections in tongue detector terminal box are tight.		X		

8 Troubleshooting

	Fault	Possible cause	Indication	Action
8.1	Point changes too loudly.	Incorrect setting of hydraulic damping.		Adjust hydraulic damping.
		Oil level too low.	Oil level incorrect.	Top up with oil.
		Hydraulic damping not tight.	Visible oil leak.	Check hydraulic damping; tighten screw connections; change sealing rings; replace hydraulic damping.
8.2	Point tongues are not held in their end positions.	Spring packets are not supplying the necessary force.		Check spring packets; make adjustment, replace if necessary.
		Drive linkage broken.		Check drive linkage.

9 Appendix

9.1 Torque specifications M_A in Nm

The torque specifications are relative to a friction count $\mu_{ges} = 0,125$.

Lubrication state - oiled

Set screws with standard metric thread acc. to DIN 13, sheet 33						
Size	M_A [Nm]				NIRO	
	6.9	8.8	10.9	12.9	A2	
M4	2,5	3	4	5	2	
M5	5	6	8	10	4	
M6	9	10	14	17	7	
M8	20	24	34	40	18	
M10	40	48	67	80	33	
M12	70	83	117	140	57	
M14	110	132	185	220	90	
M16	170	200	285	340	114	
M18	235	275	390	470	190	
M20	330	390	550	660	280	
M22	445	530	745	890	360	
M24	570	675	950	1140	460	
M27	840	995	1400	1680	680	
M30	1140	1350	1900	2280	880	

Hammer head screws:

M27 - max. 500 Nm

M24 - max. 350 Nm

Table 2, ,Torque specifications

9.2 Required tools

We recommend the following tools for installation, servicing and repair work on point setting mechanisms from HANNING & KAHL:

1)	1x	Socket wrench set	
2)	2x	Double open end wrench	30 x 32 mm
3)	2x	Open jaw wrench	41 mm
4)	1x	Open end ring wrench	13 mm
5)	1x	Open jaw wrench	36 mm
6)	1x	Hexagon pin wrench with handle	5 mm
6)	1x	Hexagon pin wrench, angled	5 mm
8)	1x	Pin wrench	6 mm
9)	1x	L-handled socket wrench	17 x 19 mm
10)	1x	Open jaw wrench set	6 - 32 mm
11)	1x	Screwdriver	5,5 mm
12)	1x	Screwdriver	7 mm
13)	1x	Screwdriver	9 mm
14)	1x	Screwdriver	10 mm
15)	1x	Screwdriver	12 mm
16)	1x	Flat chisel	Gr. 200
17)	1x	Fitter's hammer	500 g
18)	1x	Nylon hammer	Gr. 35

Table 3, Required tools

The tools listed in Table 2 are standard tools for working on HANNING & KAHL point setting mechanisms. Not all tools are needed for work on the HWU 160 setting mechanism.

10 Appendix: Project and customer-specific documentation

The author has attempted to use general terms in sections 1.0 to 9.0. Even without the Appendix 10.0 these operating instructions can be used for general information.

This section is an Appendix comprising the list of spare part assemblies and the appropriate list of components with component drawings.



Rudolf-Diesel-Straße 6 | 33813 Oerlinghausen | Germany

Phone: +49 5202 707-600 | Fax: +49 5202 707-629

info@hanning-kahl.com | www.hanning-kahl.com