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1 About these instructions

These instructions have been prepared with utmost care. They contain information and notes intended to ensure long-term and reliable operation. Should you notice any discrepancies or if you have improvement requests, then we would be glad to receive your feedback through **Customer Service**

Consider these instructions as part of the product and keep it easily accessible.

1.1 For whom are these instructions intended?

These instructions are intended for:

- Specialists:
  This group has the appropriate technical training for performing maintenance or repairing malfunctions.

With regard to minimum qualification and other requirements to be met by personnel, please also follow the chapter **Safety**

1.2 Representation conventions – symbols and characters

Various information in these instructions is represented or highlighted by the following characters in order to facilitate easy and quick understanding:

Proper setting
Specifies proper setting.

Disturbances
Specifies the disturbances that can occur from an incorrect adjustment.

Cover
Specifies which covers must be disassembled in order to access the components to be set.

Steps to be performed when operating the machine (sewing and equipping)

Steps to be performed for service, maintenance, and installation

Steps to be performed via the software control panel

The individual steps are numbered:

1. First step
2. Second step

... The steps must always be followed in the specified order.

- Lists are marked by bullet points.

Result of performing an operation

Change to the machine or on the display/control panel.

Important
Special attention must be paid to this point when performing a step.

Information
Additional information, e.g. on alternative operating options.

Order
Specifies the work to be performed before or after an adjustment.

References

Reference to another section in these instructions.

Safety

Important warnings for the user of the machine are specifically marked. Since safety is of particular importance, hazard symbols, levels of danger and their signal words are described separately in the chapter **Safety**

Location information

If no other clear location information is used in a figure, indications of **right** or **left** are always from the user's point of view.

1.3 Other documents

The machine includes components from other manufacturers. Eachmanufacturer has performed a hazard assessment for these purchased parts and confirmed their design compliance with applicable European and national regulations. The proper use of the built-in components is described in the corresponding manufacturer's instructions.

1.4 Liability

All information and notes in these instructions have been compiled in accordance with the latest technology and the applicable standards and regulations.
cannot be held liable for any damage resulting from:

- Breakage and transport damages
- Failure to observe these instructions
- Improper use
- Unauthorized modifications to the machine
- Use of untrained personnel
- Use of unapproved parts

Transport

cannot be held liable for breakage and transport damages.

Inspect the delivery immediately upon receiving it. Report any damage to the last transport manager. This also applies if the packaging is not damaged.

Leave machines, equipment and packaging material in the condition in which they were found when the damage was discovered. This will ensure any claims against the transport company.

2 Safety

This chapter contains basic information for your safety. Read the instructions carefully before setting up or operating the machine. Make sure to follow the information included in the safety instructions. Failure to do so can result in serious injury and property damage.

2.1 Basic safety instructions

The machine may only be used as described in these instructions.

These instructions must be available at the machine's location at all times.

Work on live components and equipment is prohibited. Exceptions are defined in the DIN VDE 0105.

For the following work, switch off the machine at the main switch or disconnect the power plug:

- Replacing the needle or other sewing tools
- Leaving the workstation
- Performing maintenance work and repairs
- Threading

Missing or faulty parts could impair safety and damage the machine. Only use original parts from the manufacturer.

Transport Use a lifting carriage or stacker to transport the machine. Raise the machine max. 20 mm and secure it to prevent it from slipping off.

Setup The connection cable must have a power plug approved in the relevant country. The power plug may only be assembled to the connection cable by qualified specialists.

Obligations of the operator Follow the country-specific safety and accident prevention regulations and the legal regulations concerning industrial safety and the protection of the environment.

All the warnings and safety signs on the machine must always be in legible condition. Do not remove!

Missing or damaged warnings and safety signs must be replaced immediately.

Requirements to be met by the personnel Only qualified specialists may:

- Set up the machine/put the machine into operation
- Performing maintenance work and repairs
- Performing work on electrical equipment

Only authorized persons may work on the machine and must first have understood these instructions.

Operation Check the machine during operating for any externally visible damage. Stop working if you notice any changes to the machine. Report any changes to your supervisor. Do not use a damaged machine any further.

Safety equipment Safety equipment should not be disassembled or deactivated. If it is essential to disassemble or deactivate safety equipment for a repair operation, it must be assembled and put back into operation immediately afterward.

2.2 Signal words and symbols used in warnings

Warnings in the text are distinguished by color bars. The color scheme is based on the severity of the danger. Signal words indicate the severity of the danger.

Signal words Signal words and the hazard they describe:

Signal word	Meaning
DANGER	(with hazard symbol) If ignored, fatal or serious injury will result
WARNING	(with hazard symbol) If ignored, fatal or serious injury can result
CAUTION	(with hazard symbol) If ignored, moderate or minor injury can result
CAUTION	(with hazard symbol) If ignored, environmental damage can result
NOTICE	(without hazard symbol) If ignored, property damage can result

Symbols The following symbols indicate the type of danger to personnel:

Symbol	Type of danger
	General
	Electric shock
	Puncture
	Crushing
	Environmental damage

Examples Examples of the layout of warnings in the text:

DANGER

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

This is what a warning looks like for a hazard that will result in serious injury or even death if ignored.

WARNING

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

This is what a warning looks like for a hazard that could result in serious or even fatal injury if ignored.

CAUTION

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

This is what a warning looks like for a hazard that could result in moderate or minor injury if the warning is ignored.

CAUTION

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

This is what a warning looks like for a hazard that could result in environmental damage if ignored.

NOTICE

Type and source of danger!

Consequences of non-compliance.

Measures for avoiding the danger.

This is what a warning looks like for a hazard that could result in property damage if ignored.

3 Working basis

3.1 Order of the adjustments

Order

The adjustment positions for the machine are interdependent.

Always comply with the order of individual adjustment steps as specified.

It is absolutely essential that you follow all notices regarding prerequisites and subsequent settings that are marked with in the margin.

NOTICE

Property damage may occur!

Risk of machine damage from incorrect order.

It is essential to follow the working order specified in these instructions.

3.2 Laying the cables

NOTICE

Property damage may occur!

Excess cables can impair the functioning of moving machine parts. This impairs the sewing function and can result in damage.

Lay excess cable as described above.

Ensure that all cables are laid in the machine such that the function of moving parts is not hampered.

To lay the cables:

1. Lay any excess cabling neatly in proper cable snakes.
2. Bind together the cable loops with cable ties.

Important

Tie loops wherever possible to fixed parts.

The cables must be secured firmly.

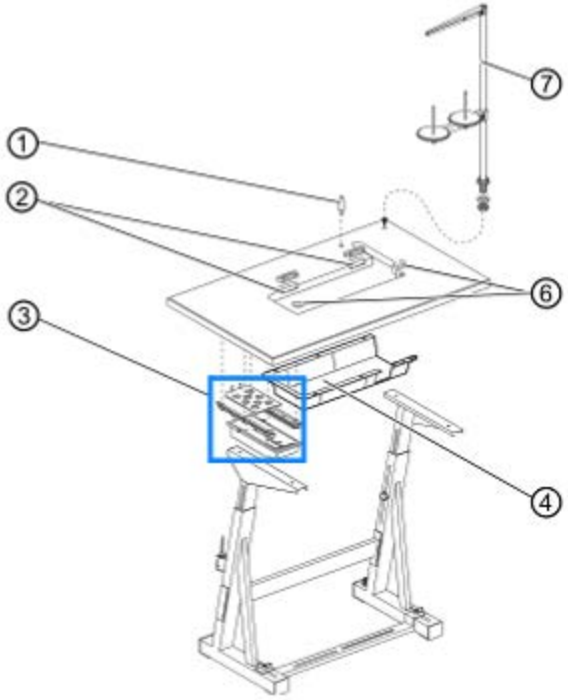
3. Cut off any overlapping cable ties.

4 Tabletop

Ensure that the tabletop has sufficient load-bearing capacity and strength. If you want to make your own tabletop, use the dimensions given in the diagram **Appendix** as a template.

4.1 Completing a short arm tabletop

Fig. 1: *Completing a short arm tabletop*



(1) - Machine head support (2) - Slot for the Lower hinge part
(3) - Drawer (4) - Oil pan (6) - Corner slot (7) - Reel stand

To complete the short arm tabletop:

1. Screw the drawer (3) with the left-hand bracket to the underside of the tabletop.
2. Screw the oil pan (4) in place under the slot for the machine.
3. Insert the reel stand (7) into the hole.
4. Assemble the reel stand (7) with nut and washer.
5. Tighten the thread reel holder and the unwinding bracket on the reel stand (7) in such a way that they are exactly opposite each other.
6. Insert the machine head support (1) into the hole.
7. Insert and fasten the lower hinge parts in the hinge slots (2).
8. Insert the rubber corners into the corner slots (6).

4.2 Inserting the machine head

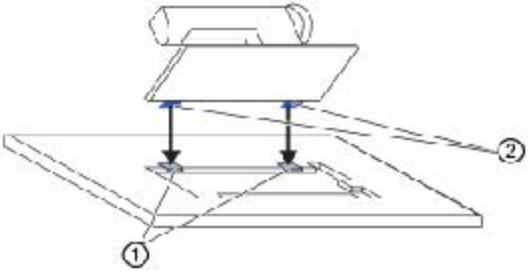
WARNING

Risk of crushing!

Risk of crushing by the machine head.
The machine head is very heavy.

Take care not to jam your hands when inserting the machine head. This especially applies when inserting the hinges into the hinge slots.

Fig. 2: Inserting the machine head



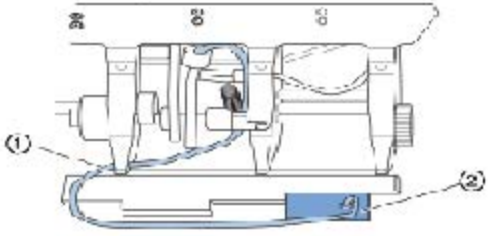
(1) - Hinge slots (2) - Hinges

To insert the machine head:

1. Tighten the hinges (2) to the machine head.
2. Insert the machine head from above at an angle of 45°.
3. Insert the hinges (2) into the hinge slots (1).
4. Fold down the machine head and insert it fully into the tabletop cutout.

4.3 Assembling the oil extraction line

Fig. 3: Assembling the oil extraction line



(1) - Tube
(2) - Filter

To assemble the oil extraction line:

1. Tilt the machine head.
2. Tighten the filter (2) inside the oil pan with the plastic adapter to the right.
3. Insert the tube of the oil extraction line (1) into the plastic adapter.

4.4 Assembling the compressed air maintenance unit

NOTICE

Property damage from incorrect setting!!

Incorrect system pressure can result in damage to the machine.

Ensure that the system pressure is set to 8 – 10 bar before assembling the compressed air maintenance unit.

The following parts make up the compressed air maintenance unit:

- System connection hose (length 5 m, diameter 9 mm)
- Hose connectors and hose clamps
- Coupling socket and coupling plug

Information
The compressed air maintenance unit is available under part number

Proper setting
The system pressure for the pneumatic unit is 8 – 10 bar.

Fig. 4: Assembling the compressed air maintenance unit

(1) - Cross bar
(2) - System connection hose
(3) - Maintenance unit
(4) - Machine hose

To assemble the compressed air maintenance unit:

1. Assemble the maintenance unit (3) to the upper cross bar (1) of the stand using the bracket, screws and clip.
2. Connect the machine hose (4) coming out of the machine head to the maintenance unit (3) at the top right.
3. Connect the system connection hose (2) to the pneumatic system.

4.5 Setting the operating pressure

NOTICE

Property damage from incorrect setting!

Incorrect operating pressure can result in damage to the machine.

Ensure that the machine is only used when the operating pressure is set correctly.

Proper setting

Refer to the **Technical data** chapter for the permissible operating pressure. The operating pressure cannot deviate by more than ± 0.5 bar.

Fig. 5: Setting the operating pressure

(1) - Pressure controller *(2) - Pressure gage*

To set the operating pressure:

1. Pull the pressure controller (1) up.
2. Turn the pressure controller until the pressure gage (2) indicates the proper setting:
   - Increase pressure = turn clockwise
   - Reduce pressure = turn counterclockwise
3. Push the pressure controller (1) down.

4.6 Lubricating

CAUTION

Skin damage from contact with oil!

Oil can cause a rash if it comes into contact with skin.

Avoid any skin contact with the oil.

If oil has come into contact with your skin, wash the affected areas thoroughly.

NOTICE

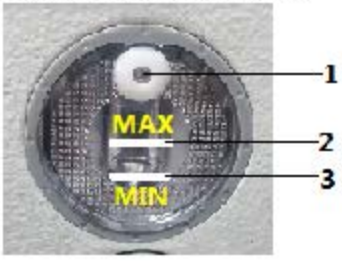
Machine damage possible from incorrect oil level!

Too little or too much oil can cause damage the machine.

During the 1st filling only pour in oil up to 2 mm below the maximum level marking.

All wicks and felt bits of the machine head are soaked in oil at the factory. This oil is conveyed to the reservoir during use. This is why you should avoid filling too much oil during initial filling.

Fig. 6: Checking the lubrication



(1) - Refill opening
(2) - Minimum level marking
(3) - Maximum level marking

To top off the oil reservoir:

1. Pour oil through the refill opening (1) up to no more than 2 mm below the maximum level marking (3).
   The oil level must be above the minimum level marking (2) and just below the maximum level marking (3).

Required oil:

CAUTION

Risk of environmental damage from oil!

Oil is a pollutant and must not enter the sewage system or the soil.

Collect waste oil carefully and dispose of it and oily machine parts in accordance with the applicable statutory regulations.

NOTICE

Machine damage possible due to incorrect oil!

An incorrect oil type can cause damage to the machine.

Only use oil specified in the operating instructions.

Only DA 10 or equivalent oil should be used for the machine, which has the following properties:

- Viscosity at 40 °C: 10 mm²/s
- Flash point: 150 °C

4.7 Connecting the control

DANGER

Risk of death from electric shock!

Unprotected contact with electricity can result in serious injuries or death.

Disconnect the power plug before connecting the control.

Ensure the power plug cannot be unintentionally reinserted.

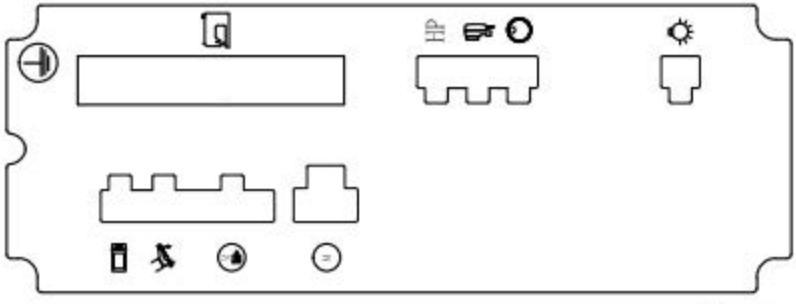
Connecting the control consists of the following work:

- Insert the plug of each connecting cable into the sockets on the back of the control.
- Connect the control to the power supply using the power cable.

Operation of the control is described in the control-specific instructions:

- **Efka DC1550/DA321G control:**
  See accessory pack included with the control.
- **DAC eco and DAC classic controls:**
  See accessory pack included with the control.
  The instructions also available in the download area at

Fig. 7: Connecting the control



4.8 Quick stroke adjustment via knee button

The increased sewing foot stroke can be activated using the knee lever (2).

The toggle switch (1) on the rear side of the knee button (2) determines whether the increased sewing foot stroke is switched on permanently or only while the knee button (2) is pressed.

Fig. 8: *Quick stroke adjustment via knee button*

(1) - Toggle switch *(2) - Knee button*

Position	Function	Description
0	Push-to-run mode	• To activate the sewing foot stroke: Press the knee button once. To deactivate the sewing foot stroke: Press the knee button one more time.
1	Hold-to-run mode	The sewing foot stroke remains activated for as long as you hold down the knee button.

Disturbances if hook distance is incorrect

After inserting a thinner needle:

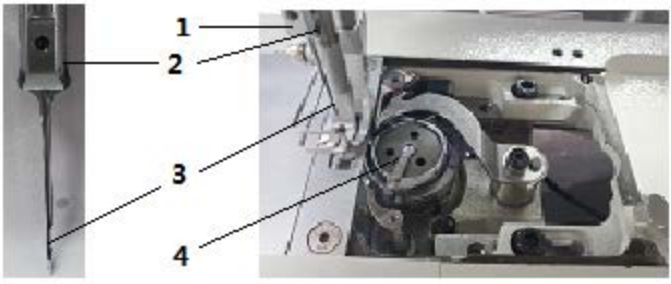
- Missing stitches
- Thread damage

After inserting a thicker needle:

- Damage to the hook tip
- Damage to the needle

4.9 In 1-needle machines

Fig. 9: In 1-needle machines



(1) - Needle bar (2) - Screw (3) - Groove (4) - Hook

To insert or change the needle on 1-needle machines:

1. Turn the handwheel until the needle bar (1) reaches the upper end position.
2. Loosen the screw (2).
3. Pull the needle out towards the bottom.
4. Insert the new needle.

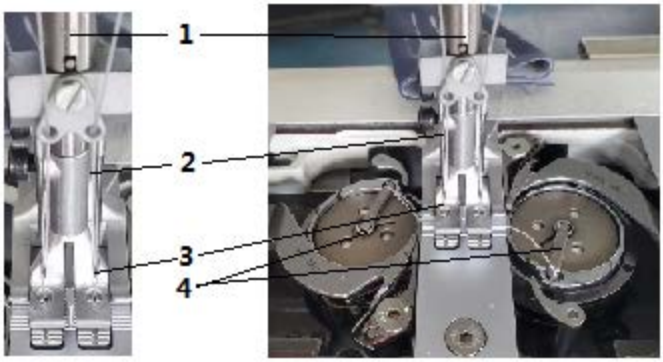
Important

Align the needle in such a way that the groove (3) faces the hook (4).

5. Tighten the screw (2).

4.10 In 2-needle machines

Fig.10: In 2-needle machines



(1) - Needle bar (2) - Screws (3) - Grooves (4) - Hook

To insert or change the needle(s) on 2-needle machines:

1. Turn the handwheel until the needle bar (1) reaches the upper end position.
2. Loosen the screws (2) on both sides.
3. Pull each of the needles out towards the bottom.
4. Insert new needles on both sides.

Important

When inserting the needles, align them such that the grooves (3) face away from each other. Each groove (3) must point to the hook (4) that belongs to this needle.

5. Tighten the screws (2) on both sides.

4.11 Feeding needle/hook thread

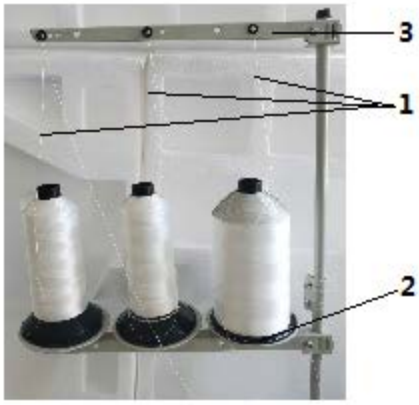
WARNING

Risk of injury from moving, cutting or sharp parts!

Crushing, cutting and punctures are possible.

Switch off the machine before feeding the needle/ hook thread.

Fig.11: Feeding needle/hook thread



(1) - Unwinding bracket (2) - Plate (3) - Thread reel holder

To feed the needle/hook thread:

1. Fit the thread reel on the plate (2).
   The unwinding bracket (1) must stand directly above the thread reel holder (3).

Information

- In 1-needle machines:
  The thread reel carrying the needle thread belongs on the left plate. The thread reel carrying the hook thread belongs on the right plate.
- In 2-needle machines:
  The thread reels carrying the left and the right needle thread belong, respectively, on the left and the right plate (2) of the left thread reel holder (3).
  The thread reel carrying the hook thread belongs on a plate (2) fitted on the right thread reel holder (3) (not shown in the figure).

---

2. Thread the needle thread at the unwinding bracket from the rear to the front.
3. Insert the needle thread

You can now thread needle and hook thread and set the thread tension

4.12 Threading the needle thread

WARNING

Risk of injury from moving, cutting or sharp parts!

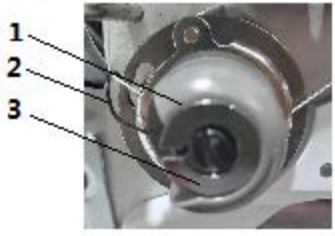
Crushing, cutting and punctures are possible.

Switch off the machine before threading the needle thread.

Do not reach under the needle.

4.12.1 In 1-needle machines

Fig.12: In 1-needle machines (1)



(1) - Thread guide
(2) - Spring tip
(3) - Tightening lever
(5) - Thread guide
(6) - Main tensioner
(7) - Additional tensioner
(8) - Pre-tensioner

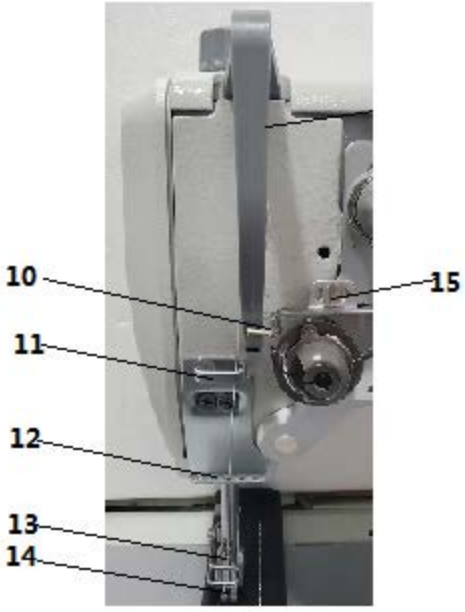
Information

Threading the needle thread at the machine head requires that the needle thread be fed properly from the reel stand

To thread the needle thread in 1-needle machines:

1. Insert the needle thread from the rear to the front through the left hole in the thread guide (1).
2. Insert the needle thread in a wavelike manner through the 3 holes of the 2nd thread guide (9):
   From above to below through the right hole, then from below to above through the hole in the middle and finally from below to above through the left hole.
3. Guide the needle thread clockwise around the pre-tensioner (8).
4. Guide the needle thread counterclockwise around the additional tensioner (7).
5. Guide the needle thread clockwise around the main tensioner (6).
6. Feed the needle thread through the thread guide (5) to the thread tension spring (4).
7. Lift the tightening lever (3) with the needle thread.
8. Pull the needle thread under the spring tip (2).

*Fig.*13:*In 1-needle machines (2)*



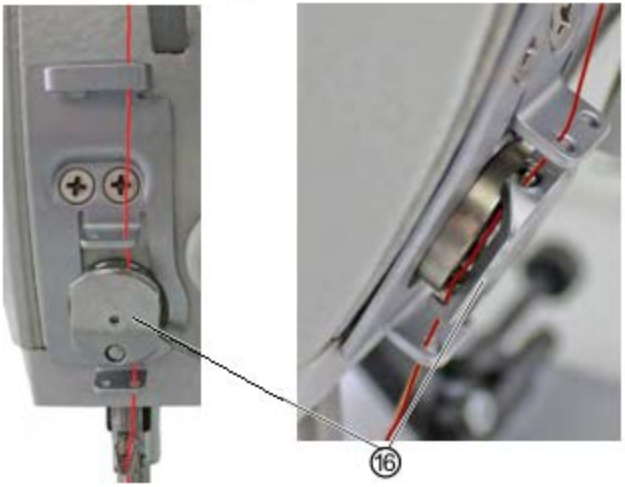
(10) - Hook
(11) - Upper thread guide
(12) - Lower thread guide
(13) - Thread guide
(14) - Needle thread regulator
(15) - Thread lever (not visible)

9. Guide the needle thread under the hook (10).
10. Insert the needle thread from bottom to top through the hole on the needle thread regulator (14).
11. Insert the needle thread from the right to the left through the thread lever (15).
12. Insert the needle thread through the upper thread guide (11).

For machines with thread clamp

13. Insert the needle thread through the right hole of the guide above the thread clamp (16).
14. Insert the needle thread through the right hole of the guide below the thread clamp (16).

*Fig.*14:*In 1-needle machines (3)*



(16) - Thread clamp

15. Insert the needle thread into the thread clamp (16) from the left so that the needle thread is held in place inside the hook of the clamp.

    The needle thread is supposed to run through the clamp almost without touching it and in such a way that it only makes contact with the guides above and below the thread clamp (16).

16. Insert the needle thread through the thread guide on the needle bar (13).

17. Insert the needle thread through the needle eye in such a way that the loose thread end faces the hook.

For machines with a short thread cutter

18. Pull the needle thread through the needle eye until the loose thread end has a length of approx. 4 cm with the thread lever (15) at the highest position.

Important

Check the thread length.

If the loose thread end is too long, the needle thread may be caught by the hook and cause a disturbance. If the loose thread end is too short, the machine cannot start sewing.

4.12.2 In 2-needle machines

2-needle machines are equipped with a 2nd Tensioning screws in triangular arrangement for the left needle thread. The threading procedure corresponds to that for the right needle thread

Fig. 15: In 2-needle machines (1)

(1) - Pre-tensioner (left needle thread)
(2) - Additional tensioner (left needle thread)
(3) - Main tensioner (left needle thread)
(4) - Main tensioner (right needle thread)
(5) - Additional tensioner (right needle thread)
(6) - Pre-tensioner (right needle thread)

Information

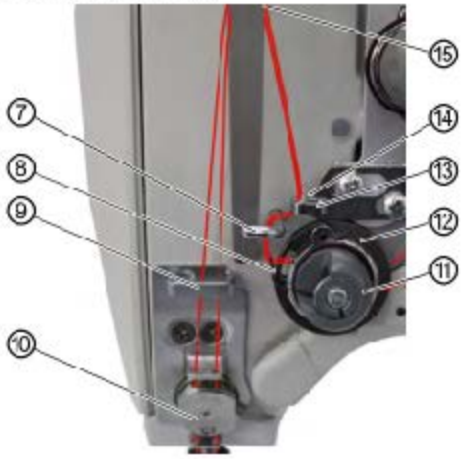
Threading the needle thread at the machine head requires that the needle threads be fed properly from the reel stand

To thread the right and the left needle thread in 2-needle machines:

1. Guide the right needle thread clockwise around the pre-tensioner (6).
2. Guide the right needle thread counterclockwise around the additional tensioner (5).
3. Guide the right needle thread clockwise around the main tensioner (4).
4. Guide the left needle thread clockwise around the pre-tensioner (1).

5. Guide the left needle thread counterclockwise around the additional tensioner (2).
6. Guide the left needle thread clockwise around the main tensioner (3).

Fig. 16: *In 2-needle machines (2)*



(7) - Hook
(8) - Spring tip
(9) - Upper thread guide
(10) - Thread clamp
(11) - Thread tension spring
(12) - Tightening lever
(13) - Needle thread regulator (right thread)
(14) - Needle thread regulator (left thread Page 30)
(15) - Thread lever (not visible)

7. Guide the right needle thread to the front thread tension spring (11).
8. Lift the front tightening lever (12) with the right needle thread.
9. Pull the right needle thread under the front spring tip (8).
10. Guide the right needle thread under the hook (7).
11. Thread the right needle thread from the bottom through the needle thread regulator (13).
12. Thread the right needle thread from the right through the lower hole on the thread lever (15).
13. Guide the left needle thread to the rear thread tension spring (11).
14. Lift the rear tightening lever (12) with the left needle thread.
15. Pull the left needle thread under the rear spring tip (8).
16. Guide the left needle thread under the hook (7).
17. Thread the left needle thread from the bottom through the needle thread regulator (14).

18. Thread the left needle thread from the right through the upper hole on the thread lever (15).
19. Insert the right and the left needle thread through the upper thread guide (9).

    The two needle threads must not cross over one another.

For machines with a short thread cutter

20. Insert the left needle thread through the left guide holes above the thread clamp.
21. Insert the right needle thread through the right guide holes above the thread clamp.
22. Insert the left needle thread through the left guide holes of the thread clamp (10).
23. Insert the right needle thread through the right guide holes of the thread clamp (10).
24. Insert the left needle thread through the left guide holes below the thread clamp.
25. Insert the right needle thread through the right guide holes below the thread clamp.

    Insert the needle threads into the thread clamp from the left / right so that the two needle threads are held in place inside the respective hook of the clamp (see figure Page 30).
26. Insert the right needle thread through the right thread guide of the needle bar.
27. Insert the left needle thread through the left thread guide of the needle bar.
28. Insert the right needle thread through the needle eye of the right needle in such a way that the loose thread end faces the right hook.
29. Insert the left needle thread through the needle eye of the left needle in such a way that the loose thread end faces the left hook.

    For machines with a short thread cutter

30. Pull the right and the left needle thread each through the needle eye until the loose thread end has a length of approx. 4 cm with the thread lever (15) at the highest position.

Important

Check the thread length.

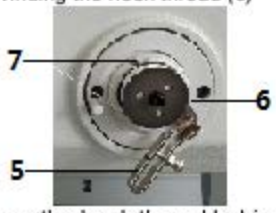
If the loose thread end is too long, the needle thread may be caught by the hook and cause a disturbance. If the loose thread end is too short, the machine cannot start sewing.

Fig. 17: Winding the hook thread (2)

(1) - Thread guide (2) - Thread guide (3) - Pre-tensioner (4) - Winder

2. Insert the hook thread in a wavelike manner through the 3 right holes of the thread guide (2): from top to bottom through the left hole, from bottom to top through the hole in the middle and, finally, from top to bottom through the right hole.
3. Guide the hook thread counterclockwise around the pre-tensioner (3).
4. Insert the hook thread in a wavelike manner through the 2 holes of the thread guide (1): from bottom to top through the left hole and from top to bottom through the right hole.
5. Guide the hook thread to the winder (4).

Fig. 18: Winding the hook thread (3)



(5) - Winder lever
(6) - Bobbin shaft
(7) - Cutter

6. Clamp the hook thread behind the cutter (7) and tear off the loose end behind it.
7. Fit the bobbin on the bobbin shaft (6).
8. Turn the bobbin clockwise until it locks audibly into place.
9. Pull the bobbin lever (5) up.
10. Switch on the machine
11. Press the pedal forwards.
    The machine sews while winding the hook thread from the thread reel onto the bobbin.
    When the bobbin is full, the machine automatically stops winding. The winder lever (5) moves back down.
    The cutter (7) is automatically moved to its vertical initial position.
12. Remove the full bobbin from the bobbin shaft (6).
13. Tear off the thread behind the cutter (7).
    You can now insert the full bobbin into the hook

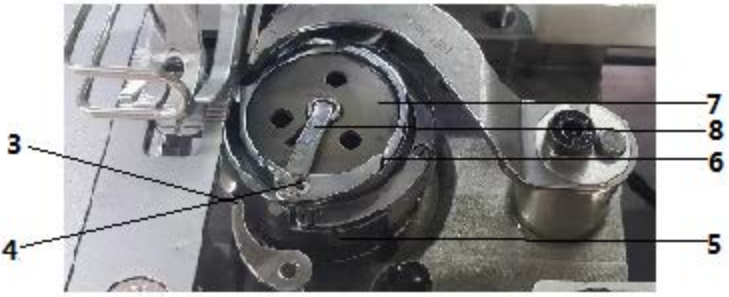
4.13 Changing the bobbin

WARNING

Risk of injury from moving, cutting or sharp parts!

Crushing, cutting and punctures are possible.

Switch off the machine before changing the bobbin.



(3) - Slot
(4) - Guide
(5) - Tension spring
(6) - Slot
(7) - Bobbin
(8) - Bobbin case retainer

To change the bobbin:

1. Swivel up the bobbin case retainer (8).
2. Remove the empty bobbin (7).
3. Insert a full bobbin (7):

Important

Insert the bobbin so that it moves in the opposite direction of the hook when the thread is pulled out.

Fig. 21: Changing the bobbin (3)

(9) - Bobbin with vision slots

Information

If the machine is equipped with a remaining thread monitor, the bobbins come with vision slots on one side. Insert these types of bobbin (9) in the hook in such a way that the vision slots are pointing up. Otherwise, the remaining thread monitor will not work.

4. Feed the hook thread through the slot (6) in the bobbin case retainer.
5. Pull the hook thread under the tension spring (5).
6. Feed the hook thread through the slot (3) and pull it approx. 3 cm further.
7. Close the bobbin case retainer (8).

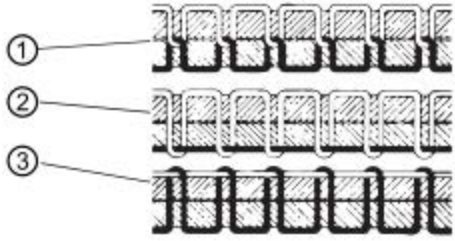
4.14 Thread tension

Together with the hook thread tension, the needle thread tension influences the final seam pattern. With thin sewing material, excessive thread tension can lead to undesired gathering and thread breakage.

Proper setting

If the tension of needle thread and hook thread is identical, the thread interlacing lies in the middle of the sewing material.
Set the needle thread tension so that the desired seam pattern is achieved with the lowest possible tension.

Fig. 22: Thread tension



(1) - Identical needle thread and hook thread tension
(2) - Hook thread tension higher than needle thread tension
(3) - Needle thread tension higher than hook thread tension

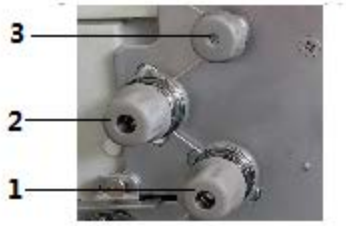
4.14.1 Setting the needle thread tension

The 3 adjusting wheels on the tensioning screw triangle determine the needle thread tension:

- Pre-tensioner (3)
- Additional tensioner (2)
- Main tensioner (1)

In the initial position, the top of the adjusting wheel is flush with the screw in the center.

Fig. 23: *Setting the needle thread tension (1)*



(1) - Main tensioner
(2) - Additional tensioner
(3) - Pre-tensioner

To increase the needle thread tension:

1. Turn the adjusting wheel clockwise.

To reduce the needle thread tension:

1. Turn the adjusting wheel counterclockwise.

Pre-tensioner

The pre-tensioner (3) holds the thread in position if the main tensioner (1) and additional tensioner (2) are completely open.

For machines with automatic thread cutter

The pre-tensioner (3) also determines the length of the initial thread for the new seam:

Shorter initial thread

1. Turn the adjusting screw of the pre-tensioner (3) clockwise.

Longer initial thread

1. Turn the adjusting screw of the pre-tensioner (3) counterclockwise.

Additional tensioner

The additional tensioner (2) increases the tension during sewing, e.g. for thickened seams.

Proper setting

The additional tensioner (2) must always be set lower than the main tensioner (1).

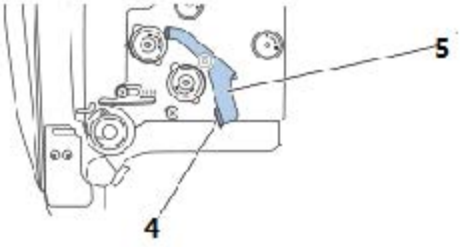
The additional tensioner (2) can be switched on and off manually or automatically.

Automatic switching of the additional tensioner

On CLASSIC machines with a push button panel on the machine arm, the additional tensioner is switched on and off via the corresponding function button on the push button panel

Manual switching of the additional tensioner

Fig. 24: Setting the needle thread tension (2)



4 - *Handle* **5** - *Lever*

On machines without a push button panel on the machine arm the additional tensioner is switched on and off via the lever on the tensioning triangle.

To switch the additional tensioner on:

1. Push the lever (5) on the handle (4) to the left.

To switch the additional tensioner off:

1. Push the lever (5) on the handle (4) to the right.

Main tensioner

The main tensioner (1) determines the normal tension during sewing.

Proper setting

The main tensioner should be set as low as possible. The thread interlacing should be exactly in the middle of the sewing material.

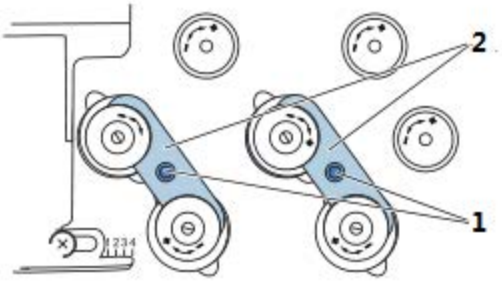
Faults due to excessively high tension

- Ruffing
- Thread breaking

4.14.2 Removing blocking of the needle thread tension

Machines with blockable adjusters are used especially in the automotive sector. With these machines the blocking must be removed before additional tensioner and main tensioner can be adjusted.

Fig. 25: *Removing blocking of the needle thread tension*



1 - *Fastening screws* **2** - *Retaining plates*

To remove the blocking of the needle thread tension:

1. Loosen the fastening screws (1).
2. Remove the retaining plates (2).
3. Set the needle thread tension
4. Place the retaining plates (2).
5. Tighten the fastening screws (1).

4.14.3 Opening the needle thread tension

- **ECO machines**
  The needle thread tension is automatically opened when the sewing feet are lifted via the knee lever
- **CLASSIC machines**
  When the thread is cut, the needle thread tension is opened automatically

4.14.4 Setting the hook thread tension

WARNING

Risk of injury from moving, cutting or sharp parts!

Crushing, cutting and punctures are possible.

Switch off the machine before you set the hook thread tension.

Fig. 26: Setting the hook thread tension

1 - *Adjusting screw*

The hook thread tension is adjusted using the adjusting screw (1).

To increase the hook thread tension:

1. Turn the adjusting screw (1) clockwise.

To reduce the hook thread tension:

1. Turn the adjusting screw (1) counterclockwise

4.15 Setting the needle thread regulator

WARNING

Risk of injury from moving, cutting or sharp parts!

Crushing, cutting and punctures are possible.

Switch off the machine before setting the needle thread regulator.

The needle thread regulator determines the tension applied to guide the needle thread around the hook.

Proper setting

The loop of the needle thread slides at low tension over the thickest point of the hook.

4.15.1 In 1-needle machines

Fig. 27: In 1-needle machines

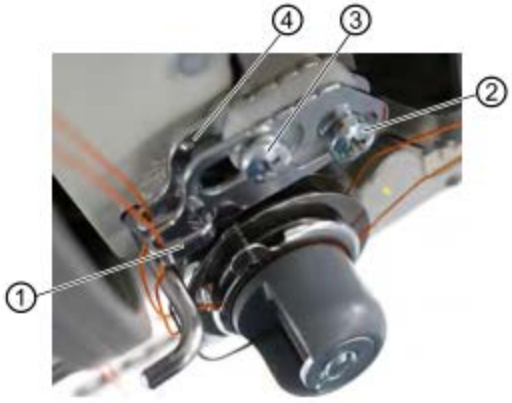
1 - *Screw*
2 - *Thread regulator*

To set the needle thread regulator in 1-needle machines:

1. Loosen the screw (1).
   - **To increase the tension:**
     Slide the needle thread regulator (2) to the right
   - **To reduce the tension:**
     Slide the needle thread regulator (2) to the left
2. Tighten the screw (1).

4.15.2 In 2-needle machines

Fig. 28: In 2-needle machines



(1) - Needle thread regulator (right needle thread)
(2) - Screw
(3) - Screw
(4) - Needle thread regulator (left needle thread)

To set the needle thread regulator for the right and the left needle thread in a 2-needle machine:

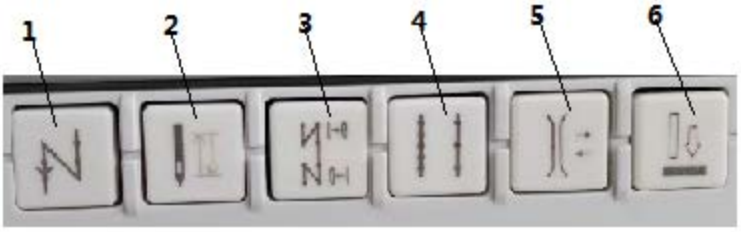
1. To set the needle thread regulator for the right needle thread: Loosen the screw (2).
   - **To increase the tension:** Slide the needle thread regulator (1) to the right.
   - **To reduce the tension:** Slide the needle thread regulator (1) to the left.
2. Tighten the screw (2).
3. To set the needle thread regulator for the left needle thread: Loosen the screw (3).
   - **To increase the tension:** Slide the needle thread regulator (4) to the right.
   - **To reduce the tension:** Slide the needle thread regulator (4) to the left.
4. Tighten the screw (3).

Information
When the largest thread quantity is required, the thread tension spring must be pulled approx. 0.5 mm up from its lower end position. This occurs when the needle thread loop passes the maximum hook diameter.

4.16 Push buttons on the machine arm

Depending on the subclass, the machine has push buttons on the machine arm for activating specific functions while sewing.

Fig. 29: Push buttons on the machine arm



1 - *Button 1* **2** - *Button 2* **3** - *Button 3*
4 - *Button 4* **5** - *Button 5* **6** - *Button 6*

Push buttons on the machine arm

Button	Function
1 	Manual sewing in reverse. The machine sews in reverse while the button is pressed.
2 	Needle position When this button (2) is activated, the needle moves to a specific position. This position is determined individually via the parameter settings (🕮 *Service Instructions).* The machine comes configured so that selecting the button (2) will bring the needle up.
3 	Start and end bartacks This button (3) cancels the general setting for sewing start and end bartacks. If start/end bartacks are on, pressing the button (3) skips the next bartack. If start/ end bartacks are off, pressing the button (3) sews the next bartack. For the general setting required for sewing start and end bartacks, refer to the 🕮 *Instructions for use for the DAC classic* control.

Button	Function
4 	Stitch length (optional) When this function is activated, the machine sews with the longer stitch length set at the upper adjusting wheel.
5 	Auxiliary thread tension The auxiliary thread tension can be activated using this button.
6 	Vertical cutter (optional) Button (6) switches on the vertical cutter. When the sewing feet are lifted, the cutter is automatically switched off, and the button (6) is deactivated.

4.16.1 Switching on and off the function of a button

To switch the function of a button on:

1. Press the desired button (1)/(2)/(3)/(4)/(5)/(6).

   The button lights up; the function is switched on.

To switch the function of a button off:

1. Press the button (1)/(2)/(3)/(4)/(5)/(6) whose function is switched on.

   The button is no longer lit; the function is switched off.

4.16.2 Assigning functions to the favorite button

Fig. 30: *Assigning functions to the favorite button*

1 - *Favorite button*
2 - *Screw*
3 - *Button*
4 - *Button*
5 - *Button*
6 - *Button*
7 - *Button*
8 - *Button*

You can assign a button function (3)-(8) of your choice to the favorite button (1).

Information

Assign the function to the favorite button (1) that you need most commonly. This allows you to switch the function on and off quickly while sewing.

If the slot of a screw (2) is in the vertical position, the favorite button (1) has been assigned the associated function.

If the slot of a screw (2) is in the horizontal position, the favorite button (1) has not been assigned the associated function.

Only one function at a time can be assigned to the favorite button (1). Only one of the screws (2) may be in the vertical position.

All screws must be turned back to their horizontal initial position before a new function is assigned.

To assign a function to the favorite button:

1. Turn all screws (2) so that the slots are horizontal.
2. Turn the screw (2) under the button of the function you wish to assign to the favorite button (1) in such a way that its slot is in the vertical position.

   You can now use both the buttons (3)/(4)/(5)/(6)/(7)/(8) and the favorite button (1) to call up this function.

5 Removing the covers

WARNING

Risk of injury!

Crushing injuries from moving parts.

Switch off the machine before you remove the covers or refit them.

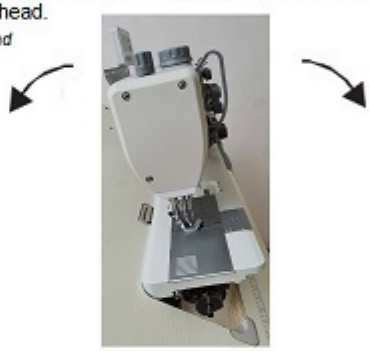
For many types of adjustment work, you will have to remove the machine covers first in order to access the components.

This chapter describes how to remove and then assemble the individual covers again. The text for each type of adjustment work then specifies only the cover that needs to be removed at that particular time.

5.1.1 Tilting the machine head

In order to access the components on the underside of the machine, you must first tilt the machine head.

Fig. 31: Tilting the machine head



Tilting the machine head

To tilt the machine head:

1. Tilt the machine head as far as it will go.

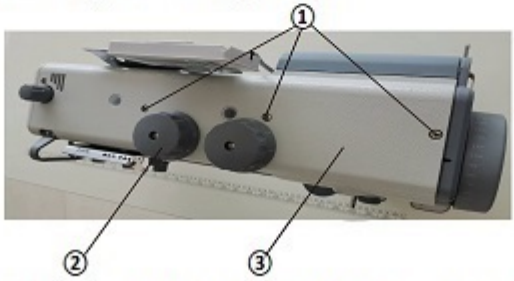
Erecting the machine head

To erect the machine head:

1. Erect the machine head.

5.1.2 Assembling and disassembling the arm cover

Fig. 32: Assembling and disassembling the arm cover



(1) - Screws (2) - left adjusting wheel for sewing foot stroke (3) - Arm cover

Disassembling the arm cover

To disassemble the arm cover:

1. Position the left adjusting wheel for the sewing foot stroke (2) to 2.
2. Loosen the screws (1).
3. Hold the arm cover (3) at the adjusting wheels and remove it.

Assembling the arm cover

To assemble the arm cover:

1. Position the left adjusting wheel for the sewing foot stroke (2) to 2.
2. Assemble the arm cover (3).
3. Tighten the screws (1).

5.1.3 Assembling and disassembling the head cover

Fig. 33: Assembling and disassembling the head cover

(1) - Screws *(2) - Headcover*

Disassembling the head cover

To disassemble the head cover:

1. Loosen the screws (1).
2. Disassemble the head cover (2).

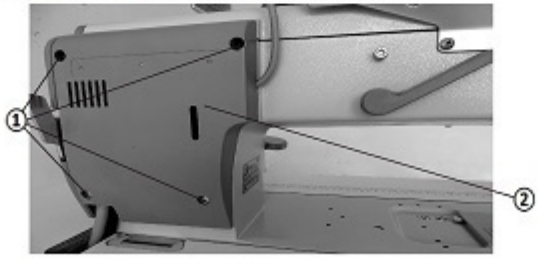
Assemble the head cover

To assemble the head cover:

1. Assemble the head cover (2).
2. Tighten the screws (1).

5.1.4 Assembling and disassembling the valve cover

Fig. 34: Assembling and disassembling the valve cover



(1) - Screws *(2) - Valve cover*

Disassembling the valve cover

To disassemble the valve cover:

1. Loosen the screws (1).
2. Disassemble the valve cover (2).

Important

Make sure not to tear off any cables.

Assembling the valve cover

To assemble the valve cover:

1. Assemble the valve cover (2).
2. Tighten the screws (1).

Important

Make sure not to pinch any cables.

5.1.5 Opening and closing the throat plate slides

Fig. 35: Opening and closing the throat plate slides

(1) - Throat plate slide (2) - Throat plate (3) - Clamping spring

Opening the throat plate slides

To open the throat plate slides:

1. Press the clamping spring (3) downwards.
2. Push the throat plate slides (1) apart.

Closing the throat plate slides

To close the throat plate slides:

1. Push the throat plate slides (1) up to the throat plate (2).

5.1.6 Assembling and disassembling the throat plate

WARNING

Risk of injury from sharp and moving parts!

Puncture or crushing possible.

Switch off the machine before you assemble or disassemble the throat plate.

Fig. 36: *Assembling and disassembling the throat plate*

(1) - Screws (2) - Throat plate (3) - Nose of the bobbin case

Disassembling the throat plate

To disassemble the throat plate:

1. Open the throat plate slides
2. Loosen the screws (1).
3. Disassemble the throat plate (2).

Assembling the throat plate

To assemble the throat plate:

1. Insert the throat plate (2).
   Ensure that the nose of the bobbin case (3) is in the cutout of the throat plate.
2. Tighten the screws (1).
3. Close the throat plate slides

5.1.7 Assembling and disassembling the feed dog

WARNING

Risk of injury from sharp and moving parts!

Puncture or crushing possible.

Switch off the machine before you assemble or disassemble the feed dog.

Fig. 37: *Assembling and disassembling the feed dog*

(1) - Feed dog (2) - Feed dog carrier (3) - Screws

Disassembling the feed dog

To disassemble the feed dog:

1. Disassemble the throat plate
2. Loosen the screws (3).
3. Remove the feed dog (1) from the feed dog carrier (2).

Assembling the feed dog

To assemble the feed dog:

1. Place the feed dog (1) onto the feed dog carrier (2).
2. Tighten the screws (3).
3. Assemble the throat plate

Important

Check the feed dog position in its movement at maximum stitch length (depending on the equipment: 6, 9 or 12) by turning the handwheel. The feed dog must not hit against the throat plate.

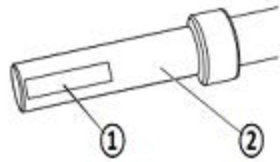
Order

Then check the following adjustment:

- Feed dog

5.2 Flats on shafts

Fig. 38: *Flats on shafts*



(1) - Flat *(2) - Shaft*

Some shafts have flat surfaces at the points where the components are screwed on. This stabilizes the connection and makes adjusting easier. For all adjustments on the surface, the first screw in the direction of rotation is screwed onto the surface.

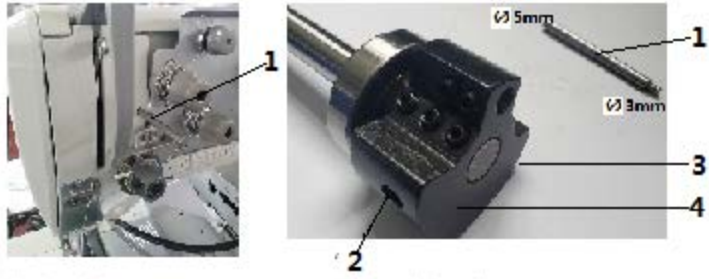
Important

Always ensure that the screw faces are completely flush with the surface.

5.3 Locking the machine in place

For some adjustments, the machine must be locked in place. To do this, the locking peg from the accessory pack is inserted into a slot on the arm shaft crank, blocking the arm shaft.

Fig. 39: *Locking the machine in place (1)*

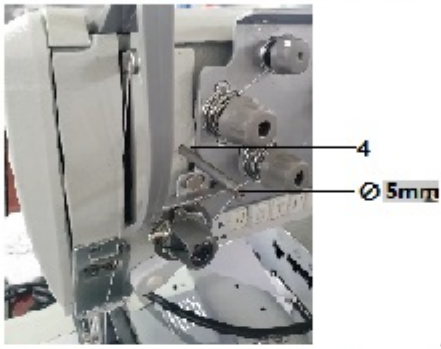


(1) - Locking peg
(2) - large arresting groove
(3) - small arresting groove
(4) - Arm shaft crank

There are 2 securing positions:

- **Position 1:** Looping stroke position
  - 5 mm end in the large slot
  - Adjusting the loop stroke and needle bar height
- **Position 2:** Handwheel zero position
  - 3 mm end in the small slot
  - Adjusting the handwheel position and checking the top dead center for the needle bar

Fig 40: *Locking the machine in place (2)*



(1) - Locking peg (4) - Arm shaft crank (5) - Locking opening

Locking the machine in place

To lock the machine in place:

1. Remove the plug from the locking slot (5).
2. Turn the handwheel until the appropriate slot is in front of the locking opening (5):
   - Small slot at handwheel position 0°
   - Large slot at handwheel position 200 – 205°
3. Insert the locking peg (1) with the appropriate end into the slot.

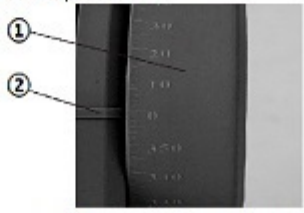
Removing the lock

To remove the lock:

1. Pull the locking peg (1) out of the slot.
2. Insert the plug into the locking opening (5).

5.4 Adjusting the handwheel into position

*Fig.*41: *Adjusting the handwheel into position*



(1) - Graduated scale (2) - Marking

For some adjustments, the graduated scale (1) on the handwheel has to be moved to a certain position.

To adjust the handwheel into position:

1. Turn the handwheel until the specified number on the graduated scale (1) is next to the marking (2).

6 Adjusting the handwheel scale

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you adjust the handwheel scale.

Proper setting

1. Lock the machine in place at position 2

   The handwheel is at position 0°.
   If a different degree number is next to the marking (2) then you will have to reset the graduated scale.

Fig. 42: Adjusting the handwheel scale

(1) - Slot *(2) - Marking*

The handwheel is fastened using 2 threaded pins, which you can see through the slot (1).

To adjust the handwheel scale:

1. Turn the handwheel until the 1st threaded pin is under the slot (1).
2. Loosen the threaded pin through the opening (1).
3. Turn the handwheel by 50° such that the 2nd threaded pin is under the slot (1).
4. Loosen the threaded pin through the opening (1).
5. Lock the machine in place at position 2
6. Turn the handwheel scale so that the 0° is at the center of the marking (2).
7. Tighten the threaded pin through the opening (1).
8. Remove the lock
9. Move the handwheel into the 50° position.
10. Tighten the threaded pin through the opening (1).

7 Positioning the arm shaft

WARNING

Risk of injury from moving parts!

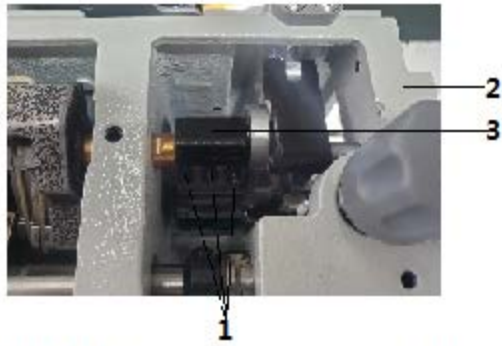
Crushing possible.

Switch off the machine before positioning the arm shaft.

Proper setting

The threaded pins (3) on the arm shaft crank (1) are seated completely on the flat.
The arm shaft crank (1) is flush with the machine casting (2).

Fig. 43: *Positioning the arm shaft*



(1) - Arm shaft crank
(2) - Machine casting
(3) - Threaded pins

To position the arm shaft:

1. Disassemble the arm cover
2. Loosen the threaded pins (3).
3. Turn the arm shaft crank (1) such that the threaded pins (3) are seated completely on the flat of the arm shaft.
4. Push the arm shaft with the arm shaft crank (1) to the right as far as it will go and flush with the machine casting.
5. Tighten the threaded pins (3).

8 Toothed belt wheels

The two toothed belt wheels must be positioned above each other so that the toothed belt can run correctly. In machines with normal lengths, the winder wheel is directly next to the upper toothed belt wheel and determines its alignment. In long arm machines, the winder wheel is fastened farther away in the center of the arm.

Order

- Always check the position of the other toothed belt wheel after making a change on either of the toothed belt wheels.

Differences between long arm machines and machines with normal lengths

In **long arm machines,** the winder wheel on the driver wheel is aligned in the center of the arm . It is irrelevant for the toothed belt wheels.
Therefore, in long arm machines, it does not matter which toothed belt wheel you check first.

In **machines with normal lengths,** the position of the upper toothed belt wheel is defined by the distance to the winder wheel.

Important

Therefore, you must first align the upper toothed belt wheel on the winder wheel and then align the lower toothed belt wheel so that the toothed belt runs correctly over both wheels.

8.1 Positioning the upper toothed belt wheel

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you position the upper toothed belt wheel.

Proper setting

The 2 threaded pins for the upper toothed belt wheel are seated flush on the flat.

Information

Additional checks for machines with normal lengths:

The distance between the winder wheel and the upper toothed belt wheel is 0.8 mm.

Fig. 44: Positioning the upper toothed belt wheel

(1) - upper toothed belt wheel
(2) - Threaded pins
(3) - Winder wheel (position in machines with normal lengths)
(4) - Toothed belt
(5) - Flat of arm shaft

To position the upper toothed belt wheel:

1. Disassemble the arm cover
2. Using the screwdriver, push the toothed belt (4) sufficiently far to the side so that the threaded pins (2) can be reached.
3. Loosen the threaded pins (2).
4. Turn the upper toothed belt wheel (1) such that the threaded pins (2) are seated flush on the flat (5) of the arm shaft.

Information

Additional setting step for machines with normal lengths:

Move the upper toothed belt wheel (1) to the side so that the distance to the winder wheel (3) is 0.8 mm.

5. Tighten the threaded pins (2).
6. Use the screwdriver to push the toothed belt (4) back again.

8.2 Positioning the lower toothed belt wheel

WARNING

Risk of injury from moving parts!

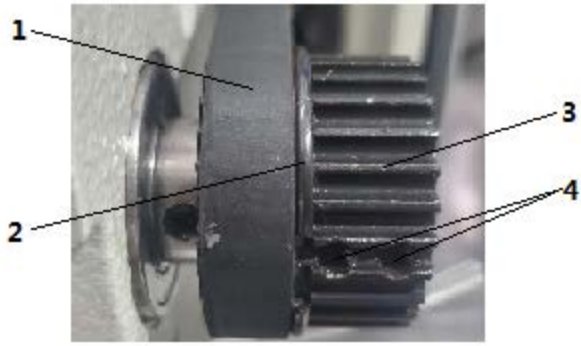
Crushing possible.

Switch off the machine before you position the lower toothed belt wheel.

Proper setting

The threaded pins for the lower toothed belt wheel are seated flush on the flat of the lower shaft.
The toothed belt runs correctly without running against the retaining ring or slipping off.

Fig 45: Adjusting the lower toothed belt wheel



(1) - Toothed belt
(2) - Snap ring
(3) - lower toothed belt wheel
(4) - Threaded pins

To position the lower toothed belt wheel:

1. Tilt the machine head
2. Loosen the threaded pins (4).
3. Turn the lower toothed belt wheel (3) such that the threaded pins (4) are seated on the flat of the arm shaft.
4. Move the lower toothed belt wheel (3) sufficiently far to the side so that the toothed belt (1) makes contact with the snap ring (2) without being pushed away.
5. Tighten the threaded pins (4).

10 Feed dog

The position and the movement of the feed dog and needle bar have to be coordinated such that the needle pierces exactly in the center of the needle hole of the feed dog.

Order

First, check the following setting:

- Needle bar linkage

10.1 Adjusting the feed dog position

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you set the feed dog position.

Proper setting

The feed dog is exactly in the center of the throat plate cutout, both sideways and in the sewing direction.

If the stitch length is 0, the needle pierces exactly in the center of the needle hole.

Various settings can be made depending on how far the position of the feed dog differs from the correct setting:

- For minimal deviations, it suffices to move the feed dog on the carrier
- If this is not sufficient, move the entire feed dog carrier on the pusher shaft

10.1.1 Moving the feed dog

Fig. 51: Moving the feed dog

(1) - Feed dog (2) - Feed dog carrier (3) - Screws

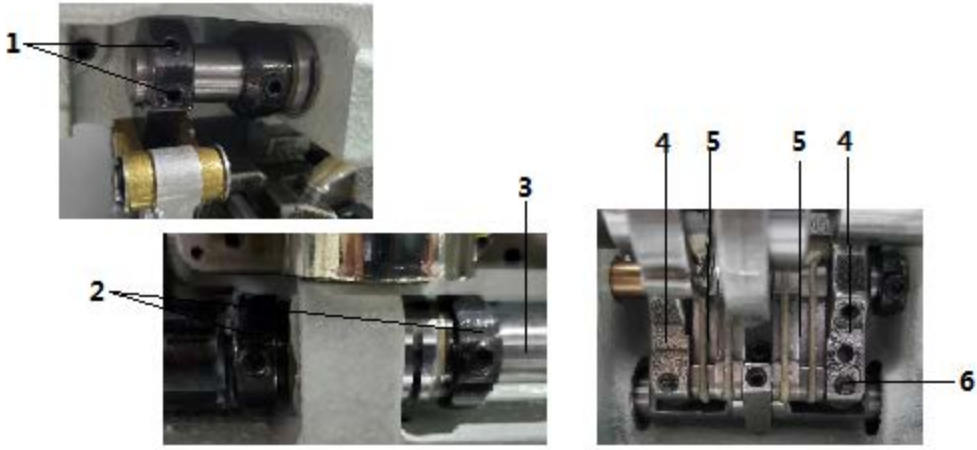
To move the feed dog:

1. Disassemble the throat plate
2. Loosen the screws (3).
3. Move the feed dog (1) on the feed dog carrier (2).
   Place the removed throat plate next to it as an aid for orientation, so that the feed dog can be screwed on straight.
4. Tighten the screws (3).

10.1.2 Moving the feed dog carrier

The feed dog carrier is connected to the stitch regulator gear via the pusher shaft and can be moved on this shaft.

Fig. 52: Moving the feed dog carrier



(1) - Screws (2) - Set collars (3) - Pusher shaft
(4) - Adjusting frame (5) - Plates (6) - Screw

To move the feed dog carrier:

1. Tilt the machine head
2. Set the upper stitch length adjusting wheel to 0.
3. Loosen the connection to the pull rod using the two screws (1).
4. Loosen the screw (6).
5. Unscrew threaded pins for the set collars (2).
6. Move the feed dog carrier perpendicular to the sewing direction so that the feed dog is exactly in the center of the throat plate cutout.
7. Push the set collars (2) toward each other as far as they will go.

Important

Make sure that the pusher shaft (3) is tightened by the set collars.

8. Tighten the threaded pins for the set collars (2).
9. Move the feed dog carrier in the sewing direction such that the feed dog is exactly in the center of the throat plate cutout.
10. Tighten the rear screw (6).
11. Tighten the connection to the pull rod using the screws (1).

Important

In the process, make sure that the feed dog height has the correct setting

10.2 Adjusting the feed dog movement

The feed dog moves in an elliptical cycle. To align this correctly, the feed movement and the stroke height and the stroke movement of the feed dog all have to be adjusted.

Order

First, check the following setting:

- Feed dog

10.2.1 Adjusting the feed movement

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you adjust the feed movement.

The proper setting for the feed movement is checked at standstill and adjusted using the pusher eccentric.

Proper setting

Handwheel at the 190° position and set the upper stitch length adjusting wheel to the maximum stitch length.

When the stitch regulator is pressed down, the feed dog stops.

Fig.53: Adjusting the feed movement

(1) - Threaded pins (2) - Pusher eccentric (3) - Stitch regulator

To adjust the feed movement:

1. Tilt the machine head
2. Set the upper stitch length adjusting wheel to the maximum stitch length.
3. Loosen the threaded pins (1).
4. Move the handwheel into the 190° position.
5. Press the stitch regulator (3) down and observe how the feed dog and needle respond.
6. Turn the pusher eccentric (2) so that the feed dog and needle no longer move when the stitch regulator (3) is pressed.
7. Tighten the threaded pins (1).

10.2.2 Adjusting the feed dog height at top dead center

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before you adjust the feed dog height.

The feed dog reaches the maximum stroke height at top dead center when the handwheel is positioned at 190°.

Proper setting

Place the feed dog in the uppermost position by turning the handwheel.

The upper edge of the feed dog protrudes 0.5 mm above the throat plate.
In machines with short thread cutters (KFA), the upper edge of the feed dog protrudes 0.8 mm above the throat plate.

Fig. 54: Adjusting the feed dog height at top dead center

(1) - Lever *(2) - Threaded pins*

To adjust the feed dog height at top dead center:

1. Tilt the machine head
2. Move the handwheel into the 190° position.
3. Loosen the threaded pins (2) on the lever (1) at the left, above the hook.
4. Turn the lever (1) such that the upper edge of the feed dog protrudes 0.5 mm (KFA = 0.8 mm) above the throat plate.
5. Tighten the threaded pins (2).

10.3 Feed dog lift (default)

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before adjusting the feed dog lift.

10.3.1 Adjusting the stroke movement

Order

First, check the following setting:

- Feed dog height

Proper setting

At the front dead center (handwheel position 90°) and at the rear dead center (handwheel position 270°) for the feed dog, the upper edge of the feed dog is at the same height as the upper edge of the throat plates.

At 90°, the feed dog is in the upward movement; at 270°, in the downward movement.

Fig. 55: Adjusting the stroke movement

(1) - Threaded pins *(2) - Stroke eccentric*

To adjust the stroke movement:

1. Tilt the machine head
2. Loosen the threaded pins (1).
3. Move the handwheel into the 90° position.
4. Turn the stroke eccentric (2) such that the upper edge of the feed dog is in the upward movement and at the same height as the upper edge of the throat plate.
5. Tighten the threaded pins (1).

10.3.2 Adjusting the compensating weight

Proper setting

Handwheel position 210°:

The threaded pin for the compensating weight is parallel to the base plate.

Fig. 56: *Adjusting the compensating weight*

(1) - *Threaded pin*
(2) - *Compensating weight*
(3) - *Base plate*

To adjust the compensating weight:

1. Tilt the machine head
2. Move the handwheel into the 210° position.
3. Unscrew the threaded pin (1) and leave the allen key inserted in the threaded pin.
4. Turn the compensating weight (2) such that the threaded pin (1) is parallel to the base plate (3).
   Use the allen key inserted in the threaded pin as a means of orientation.
5. Tighten the threaded pin (1).

10.4 Feed dog lift (adjustable stroke eccentric)

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before adjusting the feed dog lift.

10.4.1 Adjusting the stroke movement

Order

First, check the following setting:

- Feed dog height

Proper setting

At the front dead center (handwheel position 90°) and at the rear dead center (handwheel position 270°) for the feed dog, the upper edge of the feed dog is at the same height as the upper edge of the throat plate.

At 90°, the feed dog is in the upward movement; at 270°, in the downward movement.

Fig. 57: *Adjusting the stroke movement*

(1) - *Threaded pins*
(2) - *Stroke eccentric*

To adjust the stroke movement:

1. Tilt the machine head
2. Loosen the threaded pins (1).
3. Move the handwheel into the 90° position.
4. Turn the stroke eccentric (2) such that the upper edge of the feed dog is in the upward movement and at the same height as the upper edge of the throat plate.
5. Tighten the threaded pins (1).

10.4.2 Adjusting the stroke eccentric

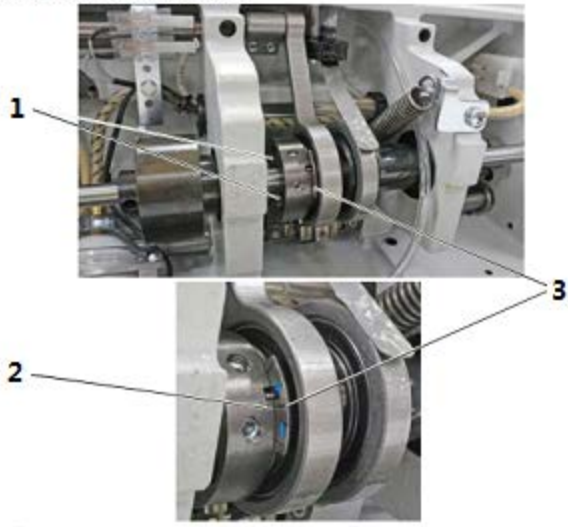
NOTICE

Property damage may occur!

The feed dog may damage the thread-pulling knife on machines with a short thread cutter.

Make sure the feed dog does not sink too deeply into the throat plate to prevent damage to the thread-pulling knife.

Fig. 58: Adjusting the stroke eccentric



(1) - Screws (2) - Grain (3) - Disk

To adjust the stroke eccentric:

1. Tilt the machine head
2. Loosen the screws (1).
3. Turn the disk (3).
   - Grain (2) in the **+** range: Increase the feed dog lift
   - Grain (2) in the **-** range: Reduce the feed dog lift
   - Grain (2) on the center line: Default feed dog lift
4. Tighten the screws (1).
5. Erect the machine head.
6. Check the feed dog lift and readjust it if necessary.

Important

The higher the feed dog lift, the deeper the feed dog plunges into the throat plate and may damage the thread-pulling knife or the hook tip. Making sure that the feed dog lift is not set too high is particularly important on machines with a short thread cutter (setting in the + range) in order to keep the thread-pulling knife from sustaining damage.

7. Check the setting.
   - Position the feed dog at top bottom center
   - Slide a sheet of paper between feed dog and thread-pulling knife

   If the sheet of paper can be slid effortlessly between feed dog and thread-pulling knife, the feed dog lift is set correctly.
   If the sheet of paper cannot be slid or is crushed between feed dog and thread-pulling knife, the feed dog lift must be reduced.

11 Aligning the needle bar linkage

Proper setting

Position the upper and lower stitch length adjusting wheel to 0.

The needle pierces exactly in the center of the feed dog needle hole.

11.1 Aligning the needle bar linkage sideways

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before aligning the needle bar linkage.

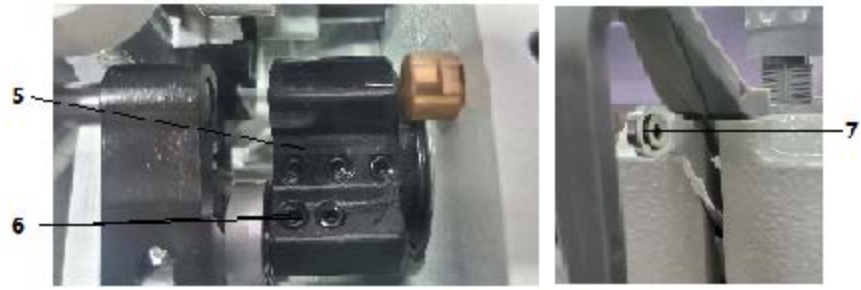
Fig. 59: Aligning the needle bar linkage sideways (1)

(1) - Threaded pins
(2) - Set collars
(3) - Needle hole
(4) - Needle bar linkage

To align the needle bar linkage sideways:

1. Disassemble the arm cover
2. Disassemble the head cover
3. Set the upper and lower stitch length adjusting wheel to 0.
4. Loosen the threaded pins (1) on the two set collars (2) at the right-hand end of the shaft for the needle bar linkage.

Fig 60: *Aligning the needle bar linkage sideways (2)*



(5) - Arm shaft crank (6) - Threaded pins (7) - Thread lever

5. Loosen the threaded pins (6) on the arm shaft crank (5).
   Make sure that the threaded pins stay on the surface.

Important

6. Move the needle bar linkage (4) sideways such that the needle pierces exactly in the center of the needle hole (3) for the feed dog.
7. Push the set collars (2) inwards as far as they will go and tighten them.
8. Tighten the threaded pins (1).
9. Align the thread lever (7) exactly in the middle of the slot.
10. Tighten the threaded pins (6).

Order

Then check the following settings:

- Looping stroke position
- Distance between hook and needle

11.2 Aligning the needle bar linkage in the sewing direction

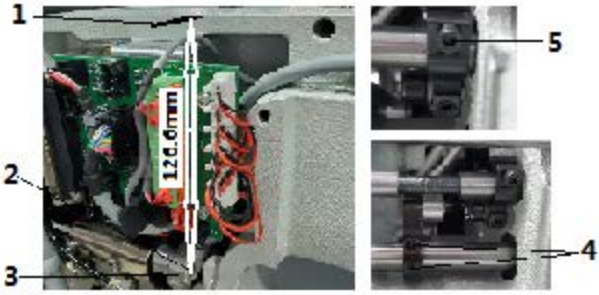
WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before aligning the needle bar linkage.

Fig 61: *Aligning the needle bar linkage in the sewing direction*



(1) - Machine arm surface (2) - Lever
(3) - Center of bolt (4) - Threaded pins (5) - Screw

Proper setting

Stitch length adjusting wheels to 0.

The lever (2) is positioned so that the distance from the surface of the arm (1) to the center of the bolt (3) is 123.6 mm.

To align the needle bar linkage in the sewing direction:

1. Disassemble the valve cover
2. Tilt the machine head
3. Set the lower stitch length adjusting wheel to 0.
4. Set the upper stitch length adjusting wheel to 0.
5. Loosen the threaded pins (4).
6. Loosen the screw (5).
7. Position the lever (2).
8. Tighten the threaded pins (4).
9. Tighten the screw (5).

Order

Then check the following setting:

- Looping stroke position

12 Position of the hook and needle

WARNING

Risk of injury from sharp and moving parts!

Puncture or crushing possible.

Move the machine into the service routine before adjusting the position of the hook and the needle.

NOTICE

Property damage may occur!

There is a risk of machine damage, needle breakage or damage to the thread if the distance between needle groove and hook tip is incorrect.

Check and, if necessary, readjust the distance to the hook tip after inserting a new needle with a different size.

12.1 Adjusting the hook side clearance

Order

First, check the following settings:

- Needle bar linkage is aligned correctly
- Looping stroke position

Proper setting

Machine is locked in place at position **1**

The distance between the hook tip and the groove of the needle is no greater than 0.1 mm.

Fig.62: *Adjusting the hook side clearance*

(1) - Set collar (2) - Threaded pins (3) - Hook support
(4) - Screws (5) - Needle groove (6) - Hook tip

To adjust the hook side clearance:

1. Tilt the machine head
2. Open the throat plate slides
3. Lock the machine in place at position **1**
4. Loosen the screws (4) for the hook support (3).
5. Loosen the threaded pins (2) for the set collar (1).
6. Shift the hook support (3) laterally.
7. The distance between the hook tip (6) and the groove of the needle (5) is maximum 0.1 mm.
   The hook tip (6) does not touch the needle.
8. Tighten the screws (4) for the hook support (3).
9. Check the looping stroke position
10. Tighten the threaded pins (2) for the set collar (1).
11. Remove the lock.

Order

Then check the following setting:

- Position of the needle guard

12.2 Adjusting the looping stroke position

Fig.63: *Adjusting the looping stroke position (1)*

(1) - Vertical center line of the needle (2) - Hook tip

The loop stroke is the path length from the lower dead center of the needle bar up to the position where the hook tip is exactly on the vertical center line of the groove for the needle.

The looping stroke is precisely 2 mm.

Order

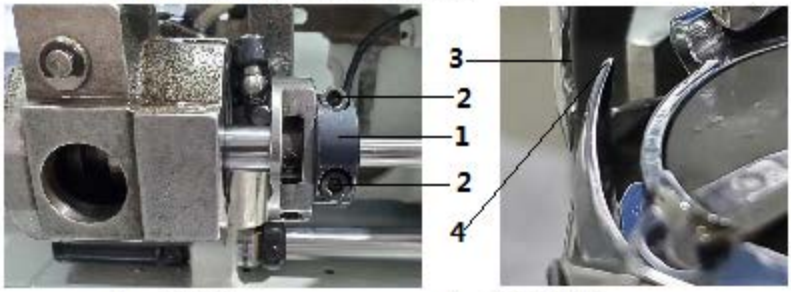
First, check the following settings:

- Needle bar linkage is aligned correctly

Proper setting

Machine is locked in place at position **1**
The hook tip (2) points exactly to the vertical center line of the needle (1).

Fig. 64: Adjusting the looping stroke position (2)



(1) - Set collar
(2) - Threaded pins
(3) - Needle groove
(4) - Hook tip

To adjust the looping stroke position:

1. Tilt the machine head
2. Disassemble the throat plate
3. Disassemble the feed dog
4. Lock the machine in place at position **1**
5. Loosen the threaded pins (2) for the set collar (1).
6. Turn the hook such that the hook tip (4) points exactly to the vertical center line of the needle (3).
7. Tighten the threaded pins (2) for the set collar (1).
8. Remove the lock.

Order

Then, check the following settings:

- Position of the needle guard
- Timing of cutting by the thread trimmer

12.3 Adjusting the needle guard

The needle guard prevents contact between needle and hook tip.

Order

First, check the following settings:

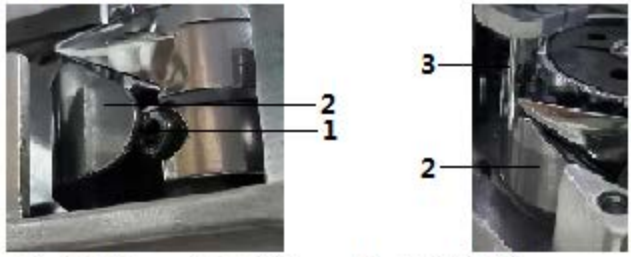
- Looping stroke position
- Hook side clearance
- Needle bar height

Proper setting

Machine is locked in place at position **1**

The needle guard pushes the needle away just enough so that it cannot be touched by the hook tip.

Fig. 65: Adjusting the needle guard



(1) - Needle (2) - Screw (3) - Needle guard

To adjust the needle guard

1. Disassemble the throat plate
2. Disassemble the feed dog
3. Turn the handwheel and check how far the needle guard (3) pushes the needle (1) away.
4. Turn the screw (2) such that the needle guard (3) just pushes the needle (1) far away enough so that it cannot be touched by the hook tip:
   - **Pushing away more strongly:** turn counterclockwise
   - **Pushing away less strongly:** turn clockwise

12.4 Adjusting the needle bar height

Order

First, check the following settings:

- Looping stroke position

Proper setting

Machine is locked in place at position **1**

Disturbance

Disturbances caused by an incorrect needle bar height

- Damage to the hook tip
- Jamming of the needle thread
- Skip stitches
- Thread breaking
- Needle breakage

Fig. 66: Adjusting the needle bar height

(1) - Needle bar (2) - Screw (3) - Needle groove (4) - Hook tip

To adjust the needle bar height:

1. Disassemble the head cover
2. Loosen the screw (2) of the needle bar (1).
3. Move the height of the needle bar (1) such that the hook tip (4) is in the middle of the lower third of the groove for the needle.
   When doing so, take care not to twist the needle to the side.
   The groove (3) must face toward the hook.
4. Tighten the screw (2) for the needle bar (1).

Order

Then, check the following settings:

- Position of the needle guard

13 Adjusting the bobbin case lifter

WARNING

Risk of injury from moving parts!

Crushing possible.

Switch off the machine before adjusting the bobbin case lifter.

Fig. 67: Adjusting the bobbin case lifter

(1) - Bobbin case
(2) - Bobbin case lifter
(3) - Nose of the bobbin case
(4) - Slot in the throat plate

The hook pulls the needle thread through between the nose of the bobbin case (3) and the slot in the throat plate (4).

The bobbin case lifter (2) now pushes the bobbin case (1) away so that a gap appears for the thread.

If the hook tip is located below the bobbin case lifter (2), the bobbin case lifter (2) must open so that the thread can also slide past in that position.

So that the thread can slip through without a problem, the width of the lifting gap and the timing of opening have to be adjusted.

Disturbance

Disturbances caused by an incorrect setting of the bobbin case lifter:

- Thread breaking
- Formation of loops on the bottom side of the seam
- Loud machine noise

13.1 Adjusting the lifting gap

Fig.68: Adjusting the lifting gap (1)

(1) - Nose of thebobbin case

(2) - Slot in the throatplate

Always check the width of the lifting gap after making changes to the needle thread size. The correct width of the lifting gap depends on the thickness of the needle thread.

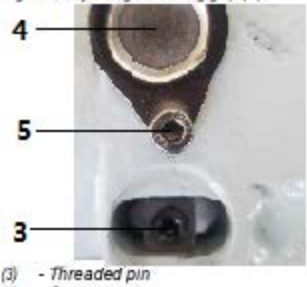
Proper setting

The needle thread slides through unobstructed between the nose of the bobbin case (1) and the slot in the throat plate (2).

To adjust the lifting gap:

1. Tilt the machine head
2. Open the throat plate slides

Fig.69: Adjusting the lifting gap (2)



(3) - Threaded pin
(4) - Cover
(5) - Screw
(6) - Bobbin case lifter

3. Loosen the screw (5).
4. Push the cover (4) downwards.
5. Loosen the threaded pin (3).
6. Set the bobbin case lifter (6) so that the gap between the nose of the bobbin case (1) and the slot in the throat plate (2) is just large enough to allow the needle thread to slip through without a problem.

Important

Ensure that the gap is not too big. The middle part of the hook must not swing back and forth, hitting the slot in the throat plate (2).

7. Tighten the threaded pin (3).
8. Push the cover (4) upwards.
9. Tighten the screw (5).

13.2 Adjusting the timing for lifting

Fig. 70: Adjusting the timing for lifting

(1) - Plug (2) - Hook housing (3) - Control cam (4) - Threaded pin

Proper setting

The bobbin case lifter starts to open exactly at the point when the hook tip is located below the bobbin case lifter after the loop is taken up.
In 1-needle machines, this happens when the handwheel position is approx. 100°.
In 2-needle machines, this happens when the handwheel position is approx. 100° for the right-hand hook, and when the handwheel position is approx. 300° for the left-hand hook.
For 100° or 300°, the threaded pin (4) is exactly in the middle of the opening. (Insert allen key in the threaded pin for orientation.)

To adjust the timing for lifting:

1. Tilt the machine head
2. Remove the plug (1) on the bottom side of the hook housing (2).
3. Loosen the threaded pin (4) through the opening.
4. Turn the handwheel until the hook tip is exactly below the bobbin case lifter.
5. Use the allen key to turn the control cam (3) so that the bobbin case lifter opens at the correct point in time.
6. Tighten the threaded pin (4).
7. Insert the plug (1) into the opening.
8. Perform a sewing test.

14 Sewing Feet

WARNING

Risk of injury from sharp and moving parts!

Puncture or crushing possible.

Switch off the machine before you adjust the sewing feet.

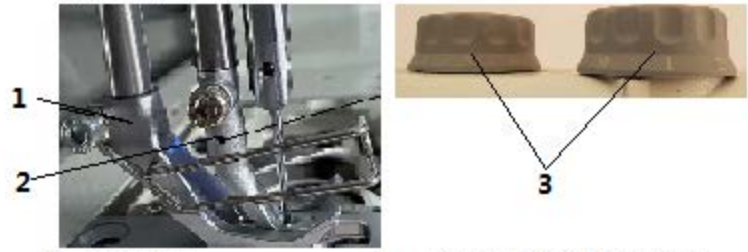
NOTICE

Property damage may occur!

Machine can be damaged if the adjusting wheels are forced.

Do not attempt to use force to set a lower sewing foot stroke at the right adjusting wheel.

Fig 71: Sewing Feet



(1) - Presser foot
(2) - Walking foot
(3) - Adjusting wheels for the sewing foot stroke

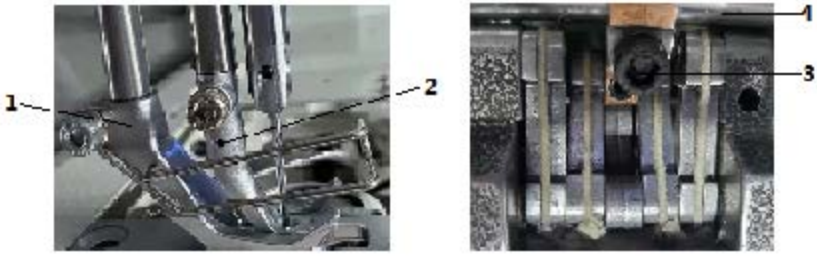
The 2 adjusting wheels (3) on the machine arm determine how high the presser foot (1) and walking foot (2) are raised when sewing.
The left adjusting wheel determines the normal sewing foot stroke.
The right adjusting wheel determines the increased sewing foot stroke.
The increased sewing foot stroke must NOT be lower than the normal sewing foot stroke.

14.1 Adjusting an even sewing foot stroke

Proper setting

For sewing foot stroke 3, the presser foot and walking foot are raised by the same height.

Fig. 72: Adjusting an even sewing foot stroke



(1) - Presser foot
(2) - Walking foot
(3) - Screw
(4) - Sewing foot lever

To set an even sewing foot stroke:

1. Disassemble the arm cover
2. Move the handwheel into the 0° position.
3. Loosen the screw (3).
4. Lower the presser foot (1) and walking foot (2) together down to the throat plate.

Important

While doing so, make sure that the walking foot is only lowered down to the throat plate. Do not inadvertently lower the walking foot through the throat plate cutout down to the feed dog.

5. Tighten the screw (3).

14.2 Adjusting the stroke movement for the walking foot

Fig. 73: Adjusting the stroke movement for the walking foot (1)

(1) - Walking foot (2) - Feed dog (3) - Needle tip

Order

First, check the following adjustment:

- Even sewing foot stroke
- The feed dog stroke movement

Proper setting

The walking foot (1) touches down exactly on the feed dog (2) when the downward movement of the needle tip (3) reaches the upper edge of the walking foot. This occurs at handwheel position 95°.

Fig. 74: Adjusting the stroke movement for the walking foot (2)

(4) - Stroke eccentric (5) - Threaded pins (6) - Threaded pin

To adjust the stroke movement for the walking foot:

1. Disassemble the arm cover
2. Screw in the threaded pin (6) so that there is a stroke.
3. Set the upper stitch length adjusting wheel to 0.

4. Loosen the threaded pins (5).
5. Turn the stroke eccentric (4) such that the walking foot touches down on the feed dog when the handwheel is in the 95° position.

Important
When doing so, ensure not to move the stroke eccentric (4) laterally on the axle.

6. Tighten the threaded pins (5).
7. Unscrew the threaded pin (6) far enough so that there is no longer any contact with the clamp.

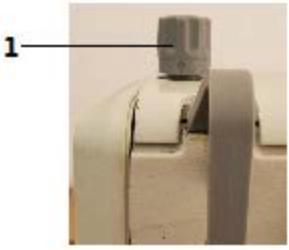
14.3 Adjusting the sewing foot pressure

The adjusting wheel at the top left of the machine arm determines the pressure for the sewing feet on the sewing material. The pressure can be adjusted continuously by turning the adjusting wheel.

The correct pressure depends on the sewing material:

- Lower pressure for soft materials
- Higher pressure for durable materials

Fig.75: Adjusting the sewing foot pressure



(1) - Adjusting wheel for the sewing foot pressure

To adjust the sewing foot pressure:

1. Turn the adjusting wheel for the sewing foot pressure (1):
   - **greater pressure:** turn clockwise
   - **lower pressure:** turn counterclockwise

14.4 Adjusting the sewing foot lifting height

CAUTION

Risk of injury from moving parts!
Crushing possible.

The machine must remain switched on so that the sewing feet can be raised.
Exercise particular caution when adjusting the sewing foot lifting height.
Do NOT place your hands under the sewing feet when they are being lowered.

When the pedal is pressed back halfway, the sewing feet can be raised during sewing, e. g. to move the sewing material.

When the pedal is pressed completely back, the sewing feet will be raised after the thread is cut so that the sewing material can be exchanged.

Proper setting
The distance between the raised sewing feet and the throat plate is preset to 25 mm on delivery.

Fig.76: Adjusting the sewing foot lifting height

(1) - Screw *(2) - Counternut*

To adjust the lifting height of the sewing foot:

1. Loosen the counternut (2).
2. Turn the screw (1) to adjust the distance between the raised sewing feet and the throat plate:
   - **Raise the sewing feet to a lesser height:** turn clockwise
   - **Raise the sewing feet higher:** turn counterclockwise
3. Tighten the counternut (2).

15 Adjusting the needle thread tension

CAUTION

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before adjusting the needle thread tension.

15.1 Adjusting the needle thread regulator

The needle thread regulator determines the tension applied to guide the needle thread around the hook. The required tension depends on the thickness of the sewing material, thread strength, and stitch length.

Lower thread tension for

- thin sewing material
- low thread strengths

Greater thread tension for

- thick sewing material
- high thread strengths

Proper setting
The loop of the needle thread slides at low tension over the thickest point of the hook, without forming loops or snagging.

Fig. 77: *Adjusting the needle thread regulator*

(1) - Screw *(2) - Needle thread regulator*

1. Open the throat plate slides
2. Turn the handwheel and observe the cycle of the needle thread around the hook.
3. Loosen the screw (1).
4. Move the needle thread regulator (2)
   - Reduce needle thread tension: slide to the left
   - Increase needle thread tension: slide to the right
5. Tighten the screw (1).

15.2 Adjusting the thread tensioning spring

Fig. 78: *Adjusting the thread tensioning spring*

(1) - Stop collar (2) - Spring (3) - Tension disk (4) - Screw

The thread tensioning spring holds the needle thread under tension from the top dead center of the thread lever up to the point when the needle eye plunges into the sewing material.

Proper setting

The thread tensioning spring does not contact the stop until the needle eye has plunged into the sewing material.

The adjustment for the thread tensioning spring must be varied according to the sewing material and the required sewing result.

To adjust the thread tensioning spring:

1. Loosen the screw (4).
2. Turn the stop collar (1) to set the spring travel.
   - Longer spring travel: turn counterclockwise
   - Shorter spring travel: turn clockwise

3. Turn the tension disk (3) to set the spring tension.
   - Greater spring tension: turn counterclockwise
   - Lower spring tension: turn clockwise

Important
Do not twist the stop collar in doing so.

4. Tighten the screw (4).

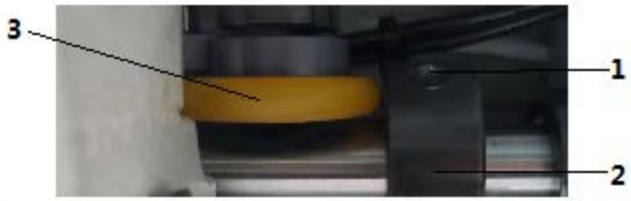
16 Winder

WARNING

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before adjusting the winder.

16.1 Adjusting the winder wheel and the driver wheel (long arm machines)

Fig. 79: Adjusting the winder wheel and the driver wheel



(1) - Threaded pins (2) - Driver wheel (3) - Winder wheel

Proper setting
The distance between the winder wheel and the driver wheel is 0.8 mm.

To adjust the winder wheel and driver wheel:
1. Disassemble the arm cover
1. Loosen the threaded pins (1).
2. Move the driver wheel (2) to the right or left so that the distance to the winder wheel (3) is exactly 0.8 mm.
3. Tighten the threaded pins (1).

16.2 Adjusting the winder

Fig. 80: Adjusting the winder (1)

(1) - Screws (2) - Screw (3) - Winder lever (4) - Shank

Proper setting

The winder wheel runs smoothly and without axial play.
The winding process will stop automatically when the required filling quantity of the bobbin is reached.

To adjust the winder:

1. Disassemble the arm cover

Disassembling the winder

2. Loosen the screws (1).
3. Remove the winder.

Adjusting the winder filling quantity

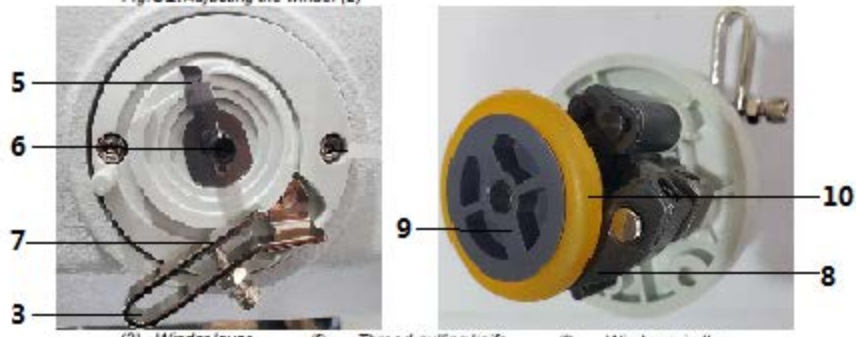
The position of the arms (4) on the winder lever (3) determines the filling quantity:

- **Parallel:** Automatic winding stop at 0.5 mm below the edge of the winder
- **Closer together:** Automatic stop with larger filling quantity
- **Further apart from each other:** Automatic stop with smaller filling quantity

4. Turn the screw (2):
   - Arms (4) closer together: turn counterclockwise
   - Arms (4) further apart from each other: turn clockwise
5. Put the completely filled bobbin onto the winder.
6. Fold the winder lever (3) upwards as far as it will go to the thread.

Adjusting the winder spacing

Fig. 81: Adjusting the winder (2)



(3) - Winder lever *(5) - Thread-pulling knife* *(6) - Winder spindle*
(7) - Right-hand screwhole *(8) - Block* *(9) - Locking disk*
(10) - Winder wheel

Fig. 82: Adjusting the winder (3)

(11) - Marking for XXL hook

To adjust the winder spacing:

7. Turn the winder spindle (6) such that the thread-pulling knife (5) is at the top right and is facing the right-hand screw hole (7).
8. Loosen the threaded pin in the block (8).
9. Adjust the winder lever (3) such that the upper arm is above the marking for the XXL hook (11).

↳ The distance between the winder lever and the outer thread on the bobbin is 2 – 3 mm.

10. Adjust the block (8) such that it is resting against the locking disk (9).
11. Adjust the block (8) such that its distance to the winder wheel (10) is 0.5 mm.
12. Tighten the threaded pin in the block (8).

Adjusting the winder run

Fig.83: Adjusting the winder (4)

(8) - Block (10) - Winderwheel (12) - Threadedpin
(13) - Threaded pin (14) - Switch cam (15) - Leaf spring

To adjust the winder run:

13. Loosen the threaded pin (13).
14. Adjust the switch cam (14) such that it is just contacting the leaf spring (15) when the block (8) has engaged in the locking disk.
15. Adjust the switch cam (14) such that the winder lever (3) has no axial play.
16. Tighten the threaded pin (13).

Assembling the winder

Fig.84: Adjusting the winder (5)

(1) - Screws

To assemble the winder:

17. Place the winder on the machine arm.
18. Tighten the screws (1).

16.3 Adjusting the hook thread guide

Fig. 85: Adjusting the hook thread guide

(1) - Screw *(2) - Hook threadguide*

The position of the hook thread guide determines how the hook thread is wound onto the bobbin.

Proper setting

The hook thread is wound on evenly over the entire width of the bobbin.

To adjust the bobbin thread guide:

1. Loosen the screw (1).
2. Turn the hook thread guide (2):
   - To the front: The hook thread will be wound on further to the front
   - To the rear: The hook thread will be wound on further to the rear

17 Thread trimmer

WARNING

Risk of injury from sharp and moving parts!

Cutting and crushing possible.

Switch off the machine before adjusting the thread trimmer.

17.1 Adjusting the height of the thread-pulling knife

Fig. 86: Adjusting the height of the thread-pulling knife

(1) - Counter blade
(2) - Thread-pulling knife
(3) - Hook bearing screw-on surface
(4) - Knife carrier
(5) - Screw
A *– Distance*

The height of the thread-pulling knife is factory-set so that the distance **A** between the upper edge of the knife carrier (4) and the hook bearing screw-on surface (3) is 10.7+0.05 mm. Fine adjustment is made by means of washers between the knife carrier (4) and the thread-pulling knife (2).

Important
When changing the knives, make sure that you do not lose the washers.

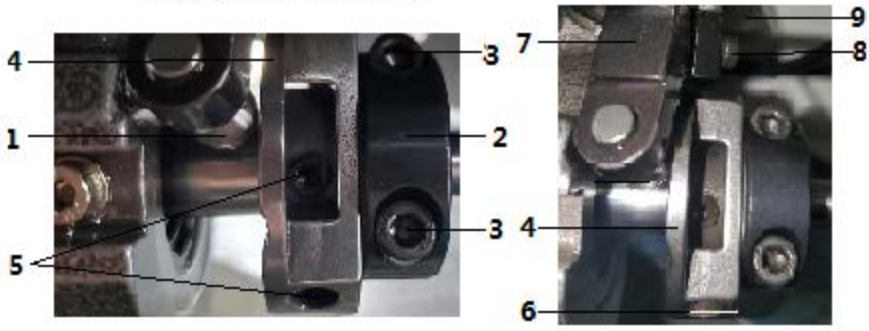
Proper setting
The thread-pulling knife (2) pivots as closely as possible above the hook and is at the same height as the counter blade (1).

To adjust the height of the thread-pulling knife:

1. Open the throat plate slides
2. Loosen the screw (5).
3. Remove the thread-pulling knife (2).
4. Place as many washers between thread-pulling knife (2) and knife carrier (4) as necessary to ensure that the upper edges of the counter blade (1) and thread-pulling knife (2) are at the same height.
5. Keep any non-required washers on the top side between the thread-pulling knife (2) and screw (5).
6. Tighten the thread-pulling knife (2) using the screw (5).

17.2 Adjusting the cutoff curve

Fig. 87: Adjusting the cutoff curve (1)



(1) - Roller
(2) - Set collar
(3) - Threaded pins
(4) - Control cam
(5) - Threaded pins
(6) - Widest extent
(7) - Actuating lever
(8) - Clamping screw
(9) - Solenoid

Proper setting
The control cam (4) makes direct contact with the set collar (2).
The distance between the widest extent (6) of the control cam (4) and the roller (1) is 0.1 mm at most.
In resting position, the circle mark on the cutting edge of the thread-pulling knife is exactly next to the tip of the counter blade.

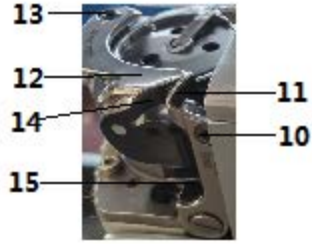
To adjust the cutoff curve:

1. Tilt the machine head
2. Open the throat plate slides
3. Loosen the threaded pins (3) on the set collar (2).
4. Push the set collar (2) as far as it will go to the left.
5. Tighten the threaded pins (3) on the set collar (2).

Important
Screw the 4 threaded pins (3) tightly in place on the set collar (2) before you loosen the threaded pins (5). The set collar (2) and control cam (4) are both mutually used as a stop and must not be loosened at the same time.

6. Loosen the threaded pins (5).
7. Press the actuating lever (7) against the solenoid (9).
8. Turn the control cam (4) such that its widest extent (6) is at the top, next to the roller (1).
9. Move the control cam (4) such that the distance between its widest extent (6) and the roller (1) is 0.1 mm at most.
10. Tighten the threaded pins (5).
11. Loosen the clamping screw (8) on the actuating lever (7).

Fig. 88: Adjusting the cutoff curve (2)

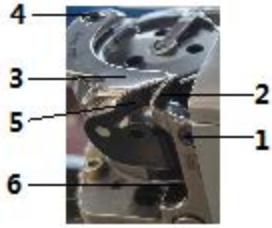


(10) - Screw *(11) - Counter blade* *(12) - Thread-pulling knife*
(13) - Screw *(14) - Hook thread clamp* *(15) - Screw*

12. Turn the thread-pulling knife (12) so that the circle mark is exactly next to the tip of the counter blade (11).
13. Tighten the clamping screw (8) on the actuating lever (7) such that the actuating lever (7) has no axial play.
14. Loosen the threaded pins (3) on the set collar (2).
15. Push the set collar (2) to the right as far as it will go and against the control cam (4).
16. Check the looping stroke position
17. Tighten the threaded pins (3) on the set collar (2).

17.3 Adjusting the cutting pressure

Fig. 89: Adjusting the cutting pressure



(1) - Screw *(2) - Counter blade* *(3) - Thread-pulling knife*
(4) - Screw *(5) - Hook thread clamp* *(6) - Screw*

The shape of the thread-pulling knife automatically creates the required cutting pressure as soon as the thread-pulling knife and counter blade make contact.

Proper setting

In resting position, the hook thread clamp makes contact with the thread-pulling knife without any pressure being applied. Any 2 threads with the greatest strength used for sewing can be neatly cut simultaneously.

Disturbance

Disturbances caused by an incorrect setting:

- Increased knife wear when the pressure is too great
- Problems when sewing on if the clamping pressure is too high
- Problems in cutting the thread

To adjust the cutting pressure:

1. Open the throat plate slides
2. Turn the handwheel until the thread-pulling knife (3) can be swung out by hand.
3. Loosen the screw (1).
4. Position the thread-pulling knife (3) so that the arrow mark is exactly next to the tip of the counter blade (2).
5. Turn the hook thread clamp (5) so that it rests against the thread-pulling knife (3).
6. Turn the counter blade (2) so that it rests against the thread-pulling knife (3).
7. Tighten the screw (1).
8. Check the position of the knife, as the counter blade can easily become warped when the screw is being tightened.

17.4 Adjusting point in time for cutting

Fig. 90: Adjusting point in time for cutting

(1) - Roller *(2) - Set collar* *(3) - Control cam*
(4) - Thread-pulling knife *(5) - Counter blade* *(6) - Threaded pins*

Proper setting
The threads are cut when the thread lever is at the top dead center (hand-wheel position 60°).

To adjust the point in time for cutting:

1. Tilt the machine head
2. Open the throat plate slides
3. Loosen the threaded pins (6).
4. Turn the handwheel until the thread-pulling knife (4) can be swung out by hand.
5. Swivel the thread-pulling knife (4) forward until the circle mark is exactly next to the tip of the counter blade (5).
6. Adjust the handwheel position to 60°.
7. Push the control cam (3) to the left as far as it will go and against the set collar (2).
8. Turn the control cam (3) such that the roller (1) runs up at the contour of control cam (3) and the widest extent of the control cam is at hand-wheel position 60° at the highest point.
9. Tighten the threaded pins (6).
10. Check adjustment:
    - Insert the thread into thread-pulling knife (4) and slowly turn the handwheel.
    - Check the handwheel position at which the thread is cut.
11. If necessary, repeat adjustment steps 1 – 7 until the cut takes place at 60°.

18 Adjusting the safety snap-on coupling

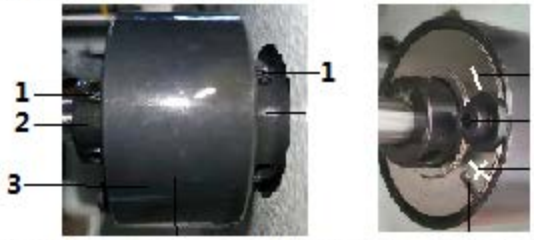
WARNING

Risk of injury from moving parts!
Crushing possible.
Switch off the machine before you adjust the safety release clutch.

The safety release clutch disengages in the event of the thread jamming and thus prevents the hook from being misadjusted or damaged.

18.1 Attaching the safety release clutch

Fig. 91: Attaching the safety release clutch



(1) - Threaded pins (2) - Left-hand set collar (3) - Safety release clutch

Proper setting

The 4 threaded pins (1) on the two set collars next to the safety release clutch (3) must be parallel to one another. After the safety release clutch has disengaged, they are no longer parallel.

To latch the safety release clutch:

1. Tilt the machine head
2. Turn the left set collar (2) such that the threaded pins (1) are parallel to one another.

   The safety release clutch latches into place.

18.2 Adjusting the torque

NOTICE

Property damage may occur!

If you change the torque, it could be that the coupling will not disengage although this would be required.
This could cause machine damage, e.g. in the event of the thread jamming.

Do NOT change the factory adjustment.
Make sure that the torque remains at 8 Nm.

Fig. 92: Adjusting the torque

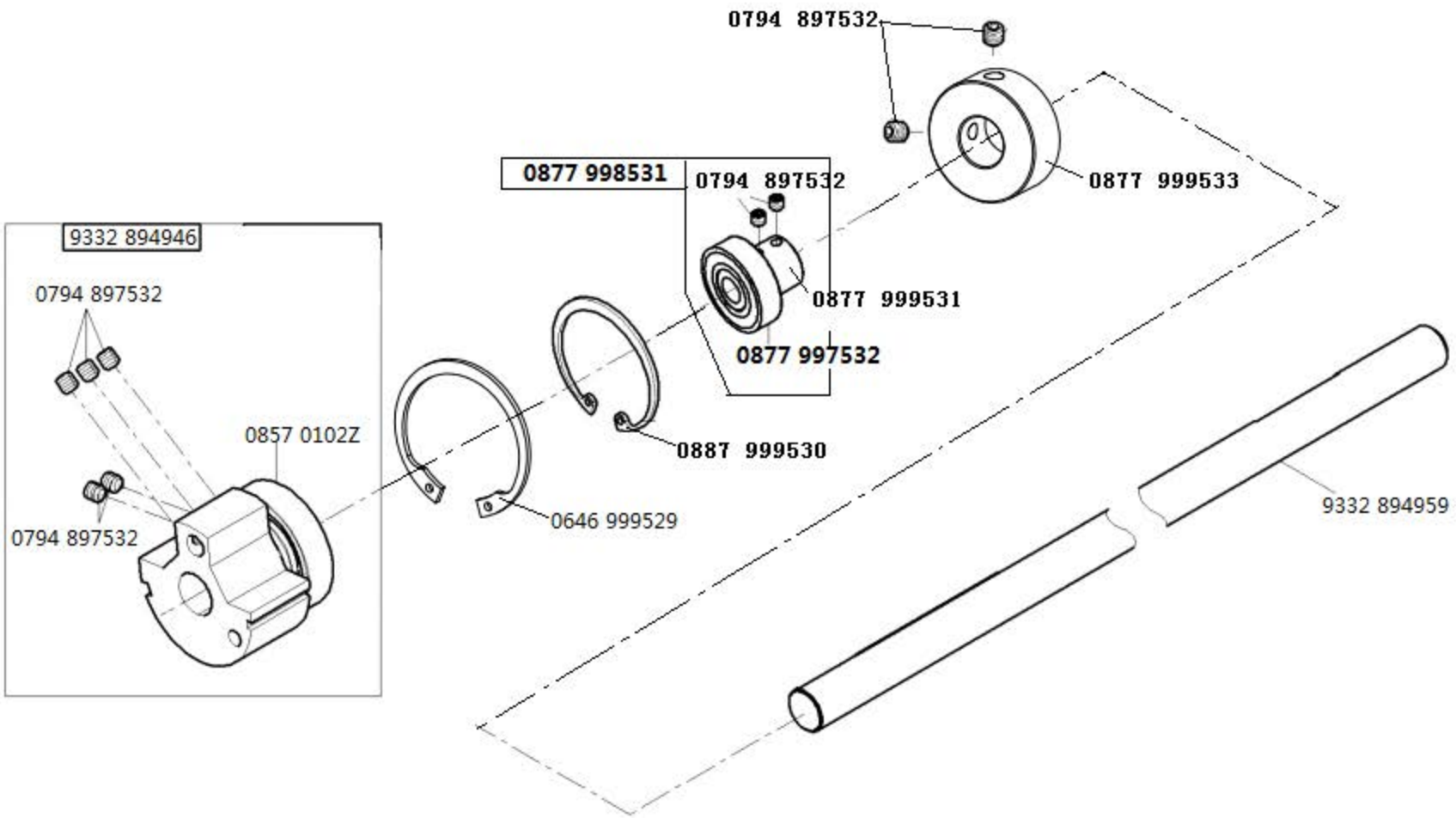
(1) - Threaded pins (2) - Left-hand set collar (3) - Safety release clutch (4) - Right-hand set collar (5) - Adjustment slot (6) - Marking point (7) - Screw

Proper setting

The machine is set at the factory so that the torque is 8 Nm when the marking point (6) is exactly above the adjustment slot (5) of the disk.

To adjust the torque:

1. Tilt the machine head
2. Loosen the screw (7).
3. Using the screw driver, turn the disk on the adjustment slot (5) so that 8 Nm is reached for the torque.
   - Increase force: turn in the direction +
   - Decrease force: turn in the direction -
4. Tighten the screw (7).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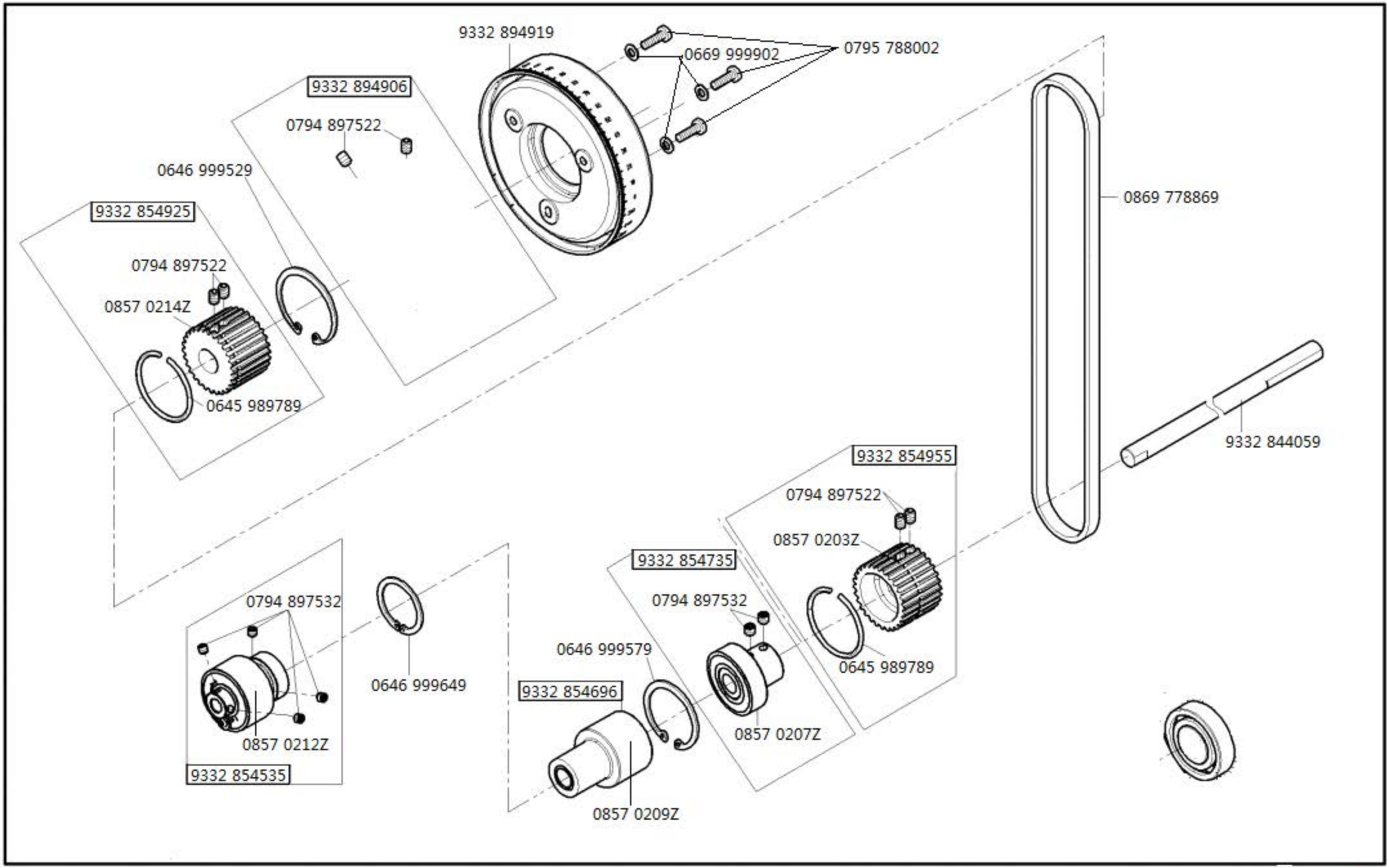
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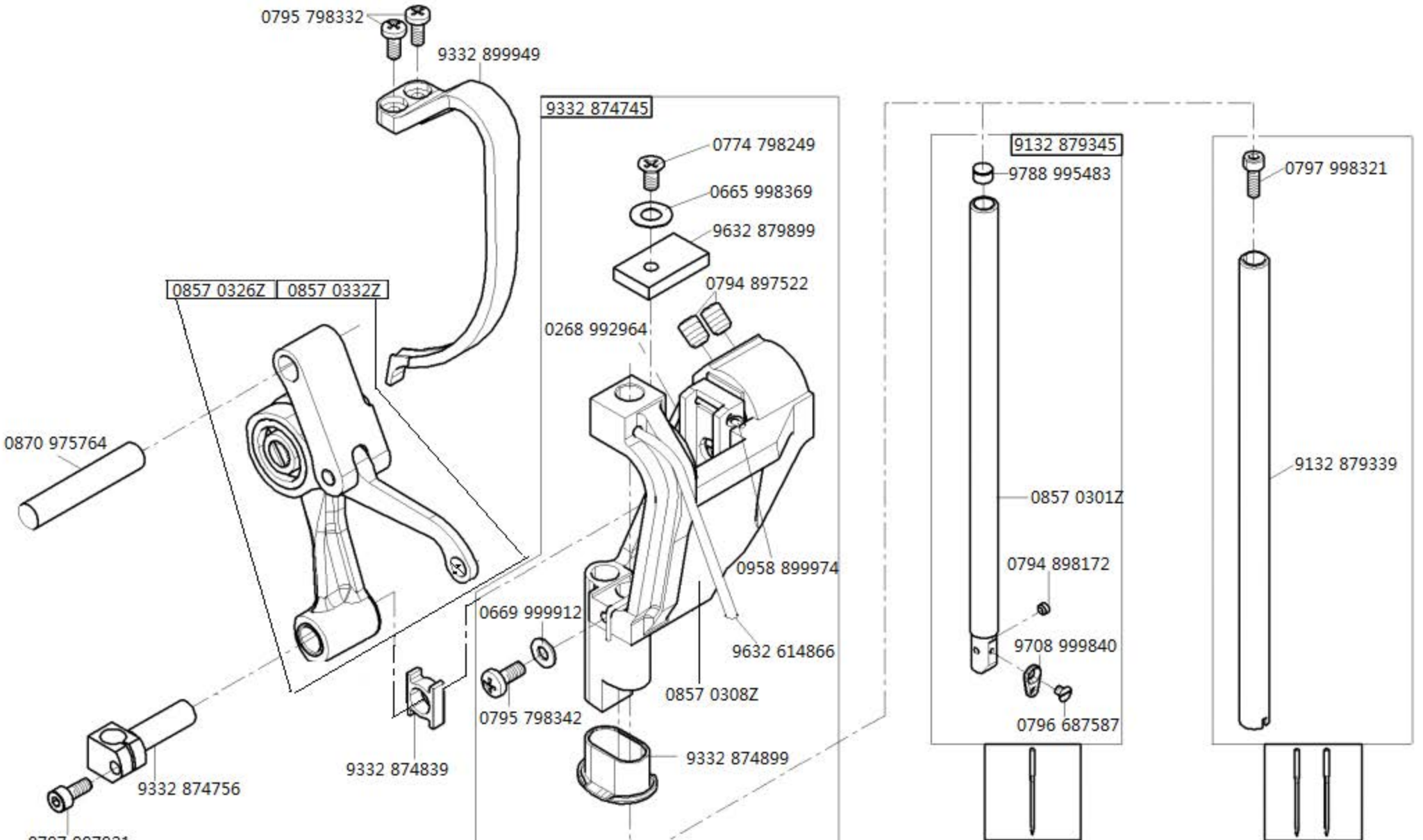
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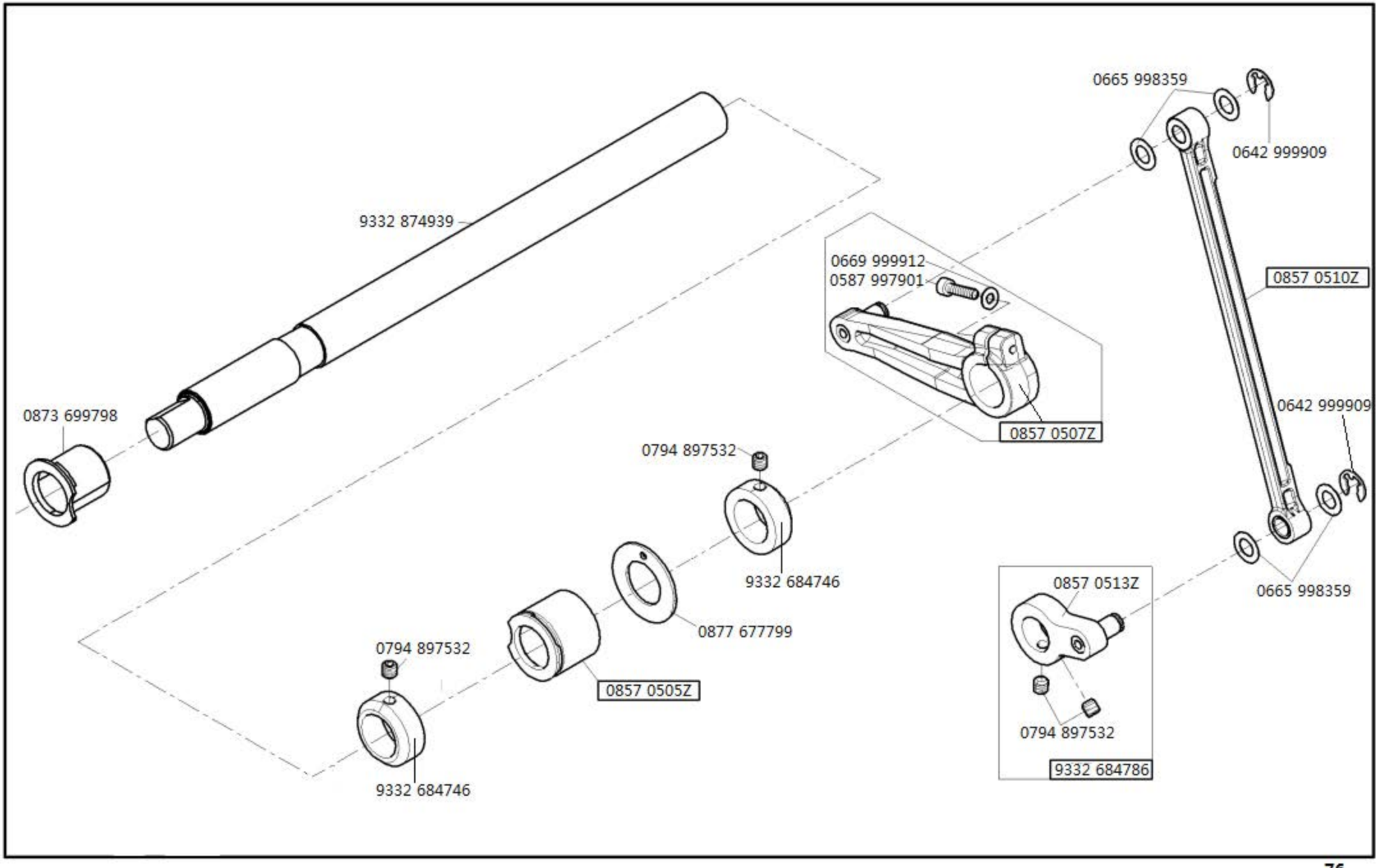
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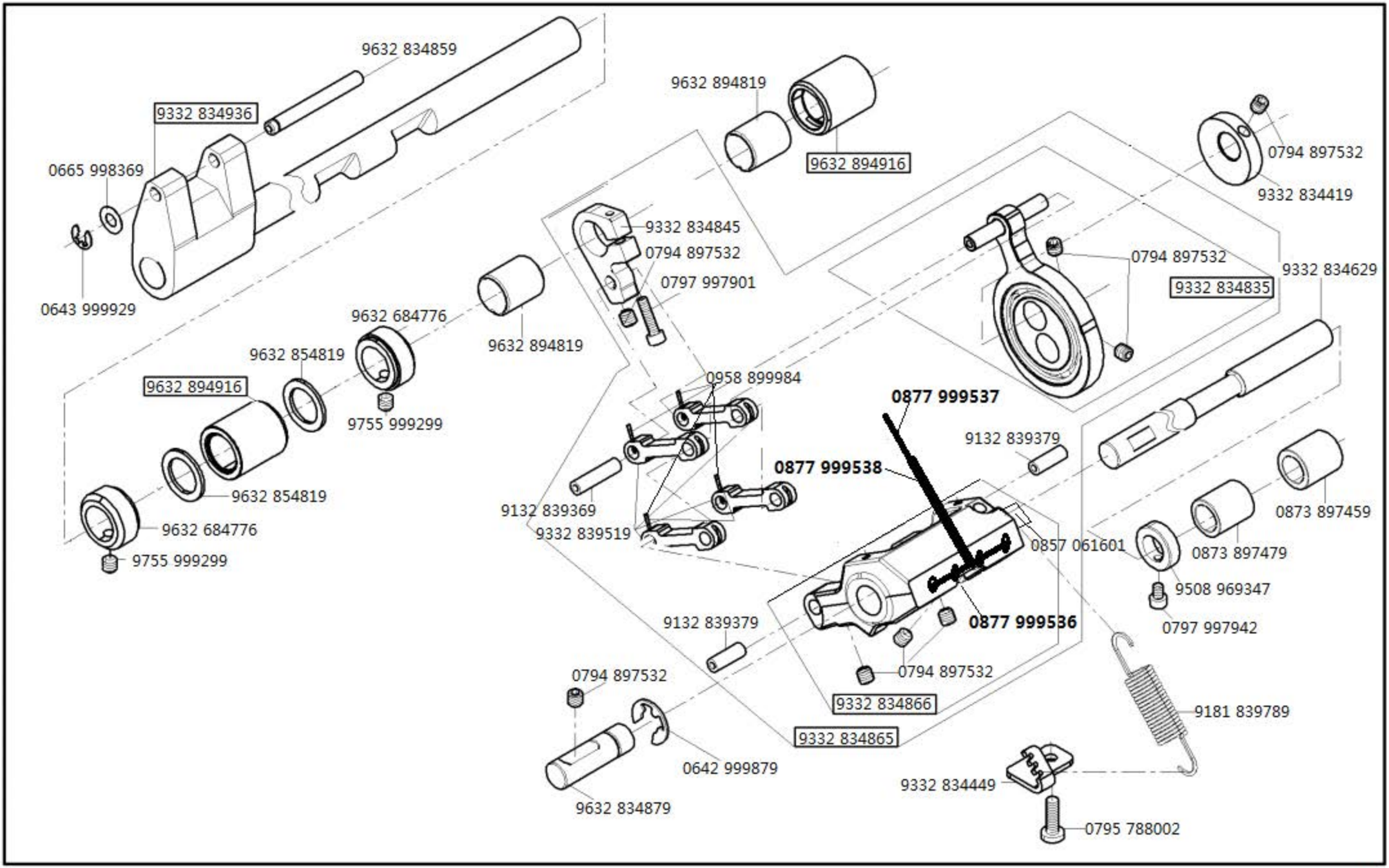
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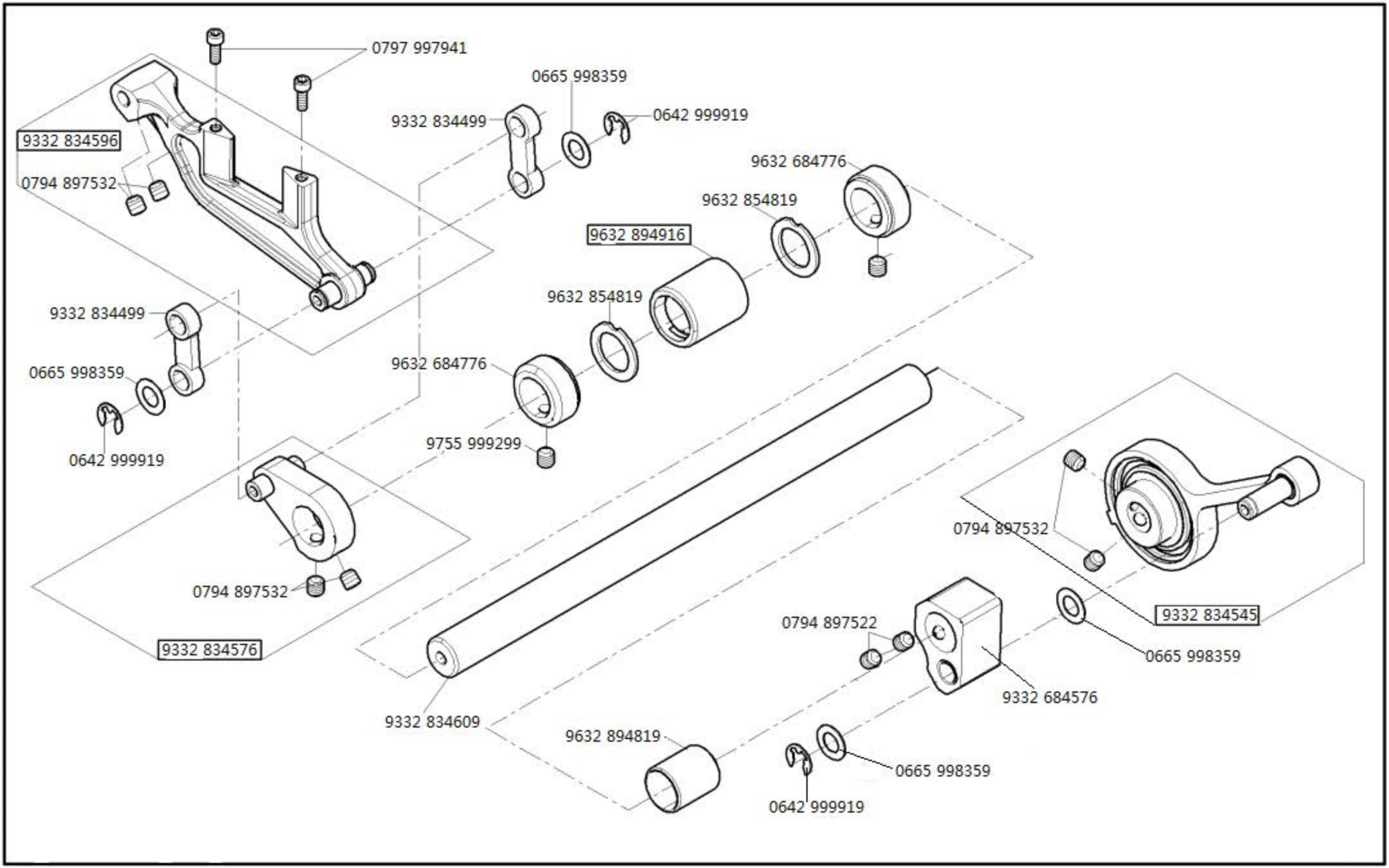
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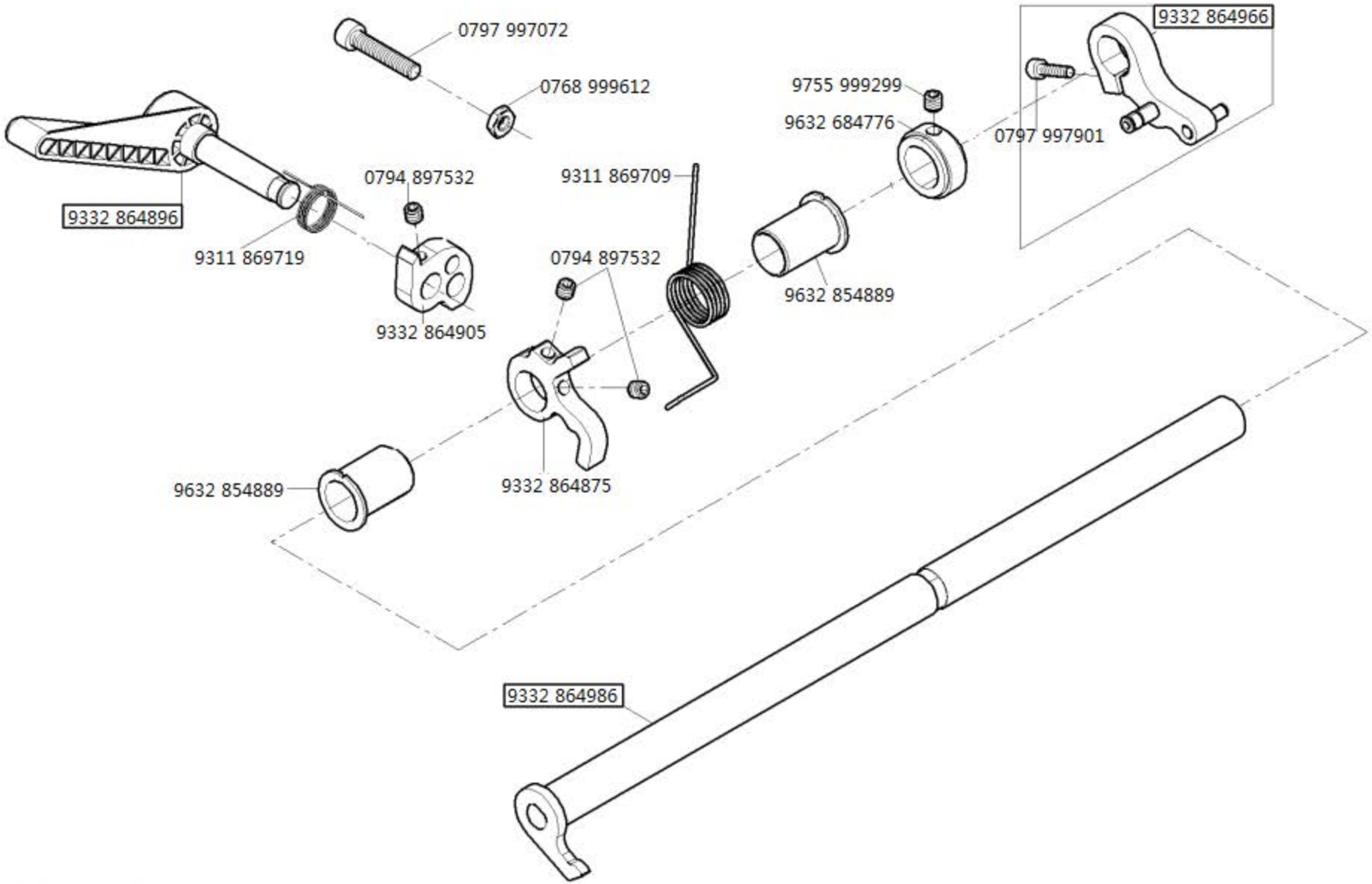
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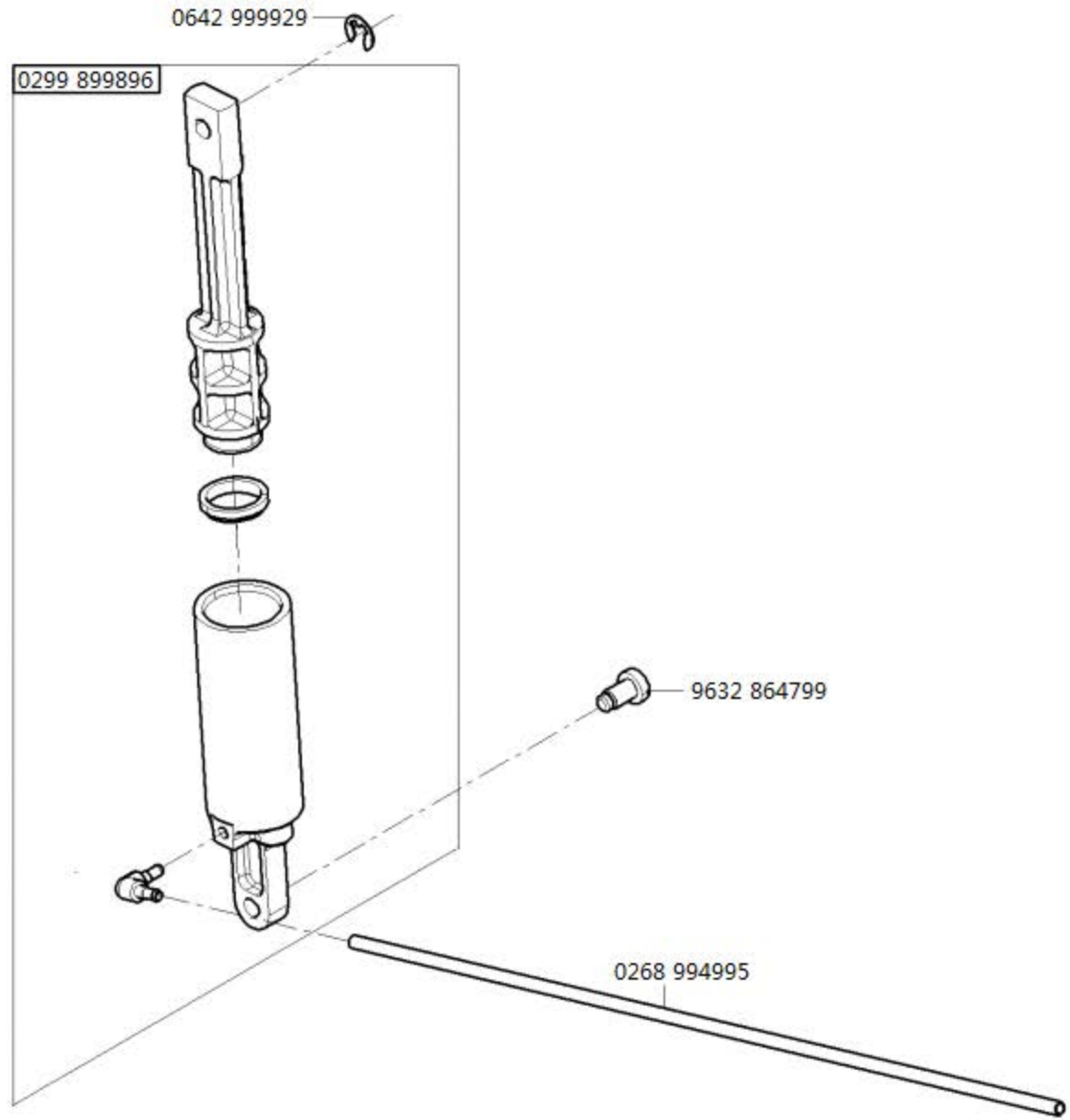
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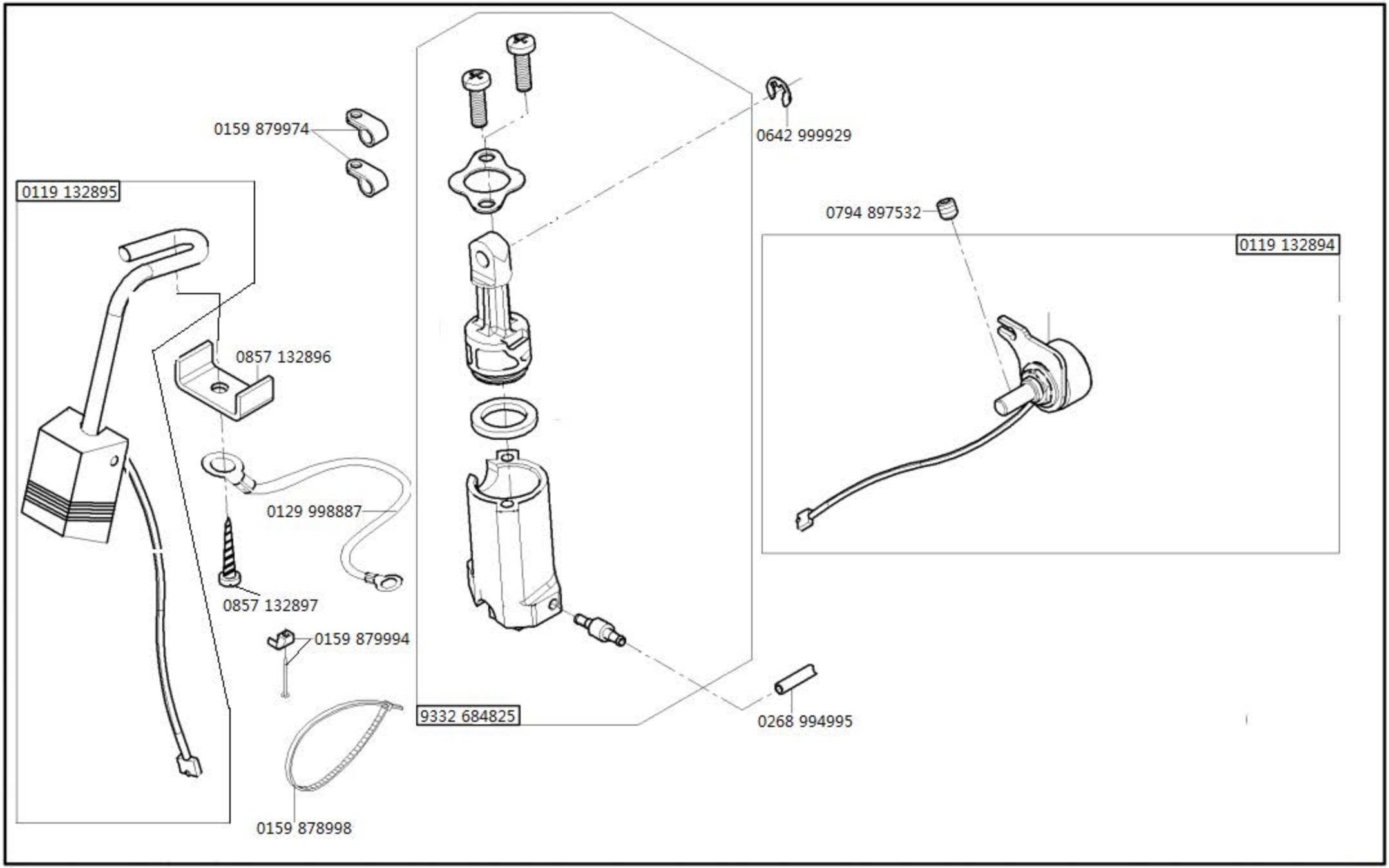
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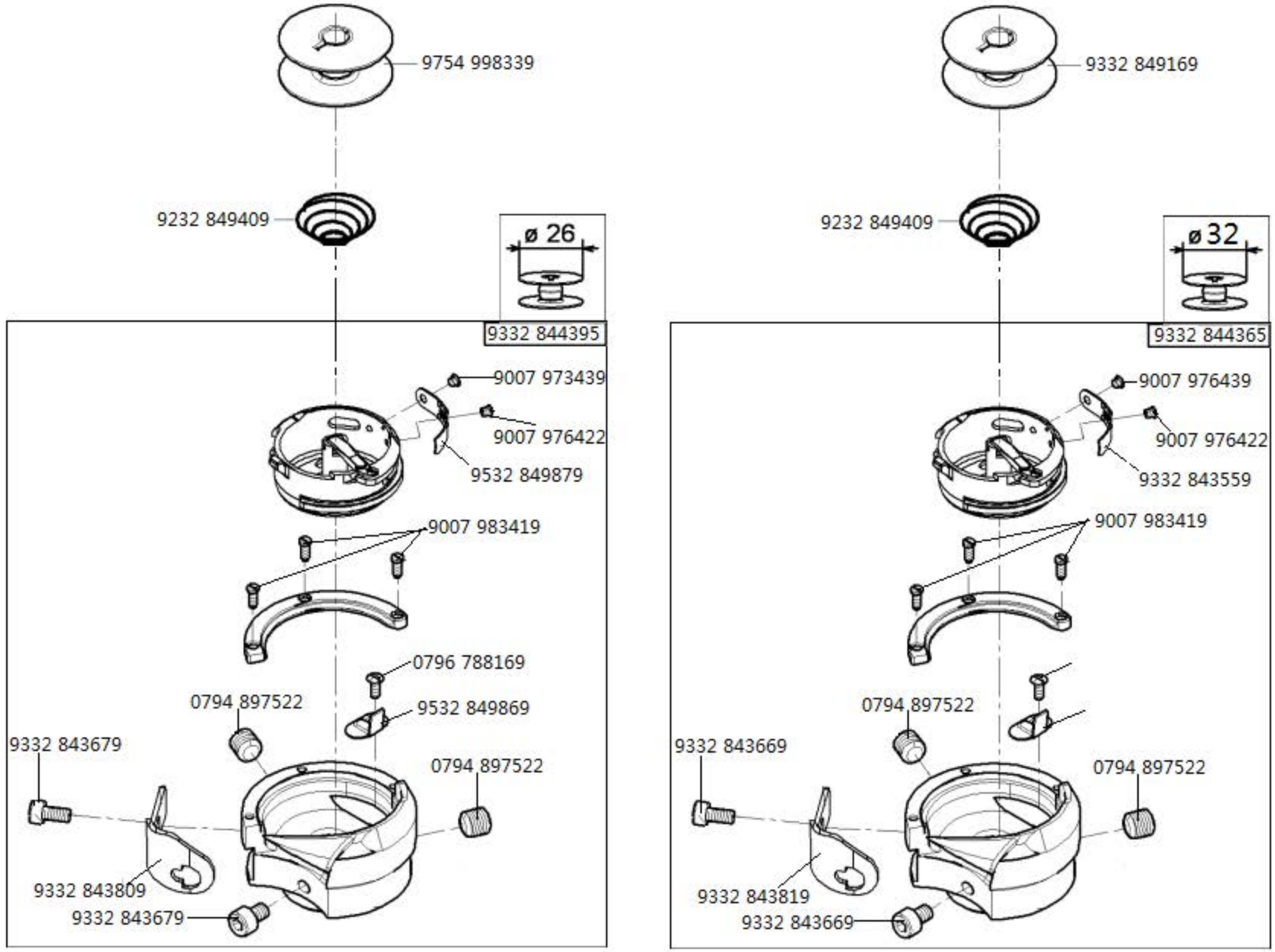
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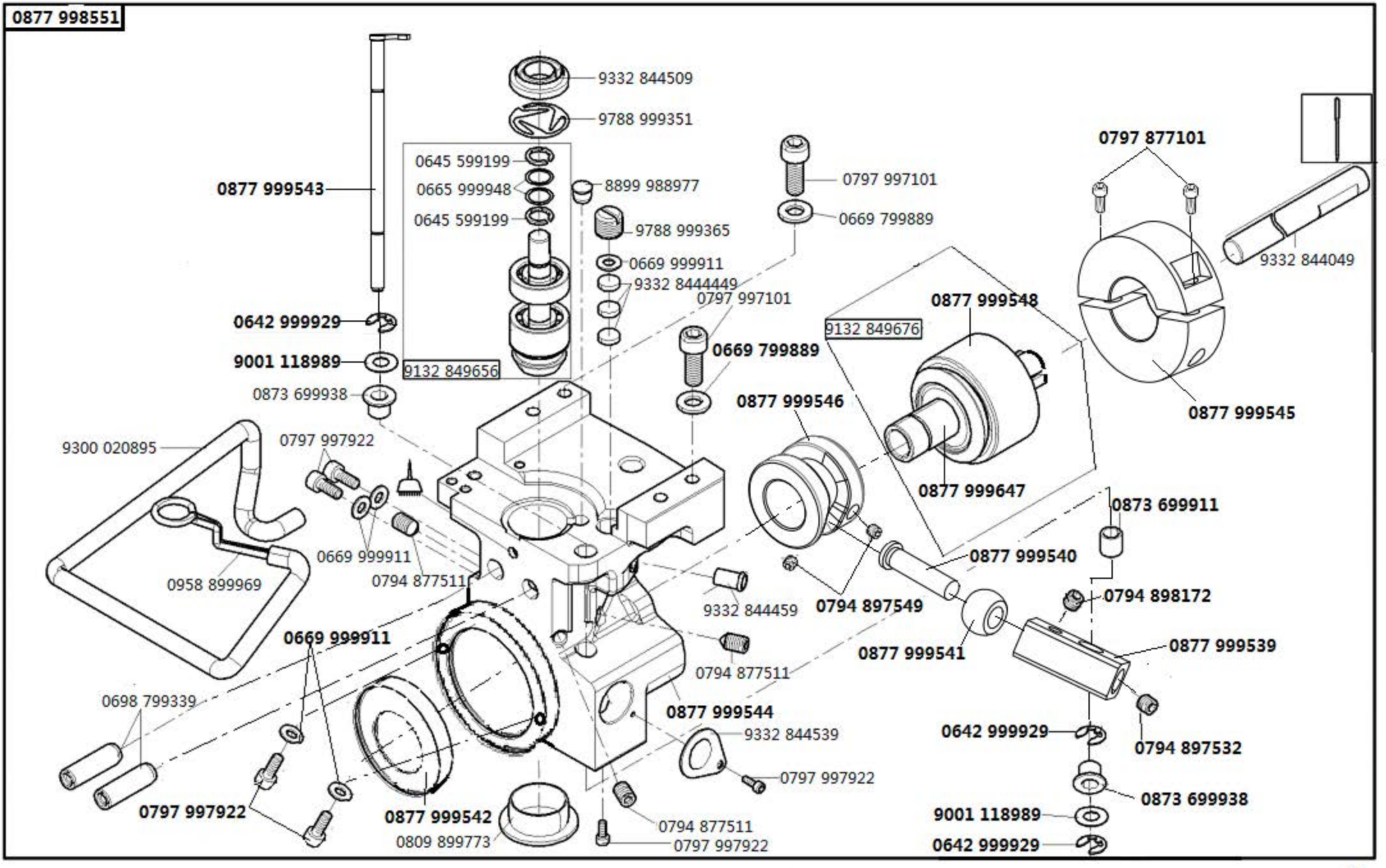
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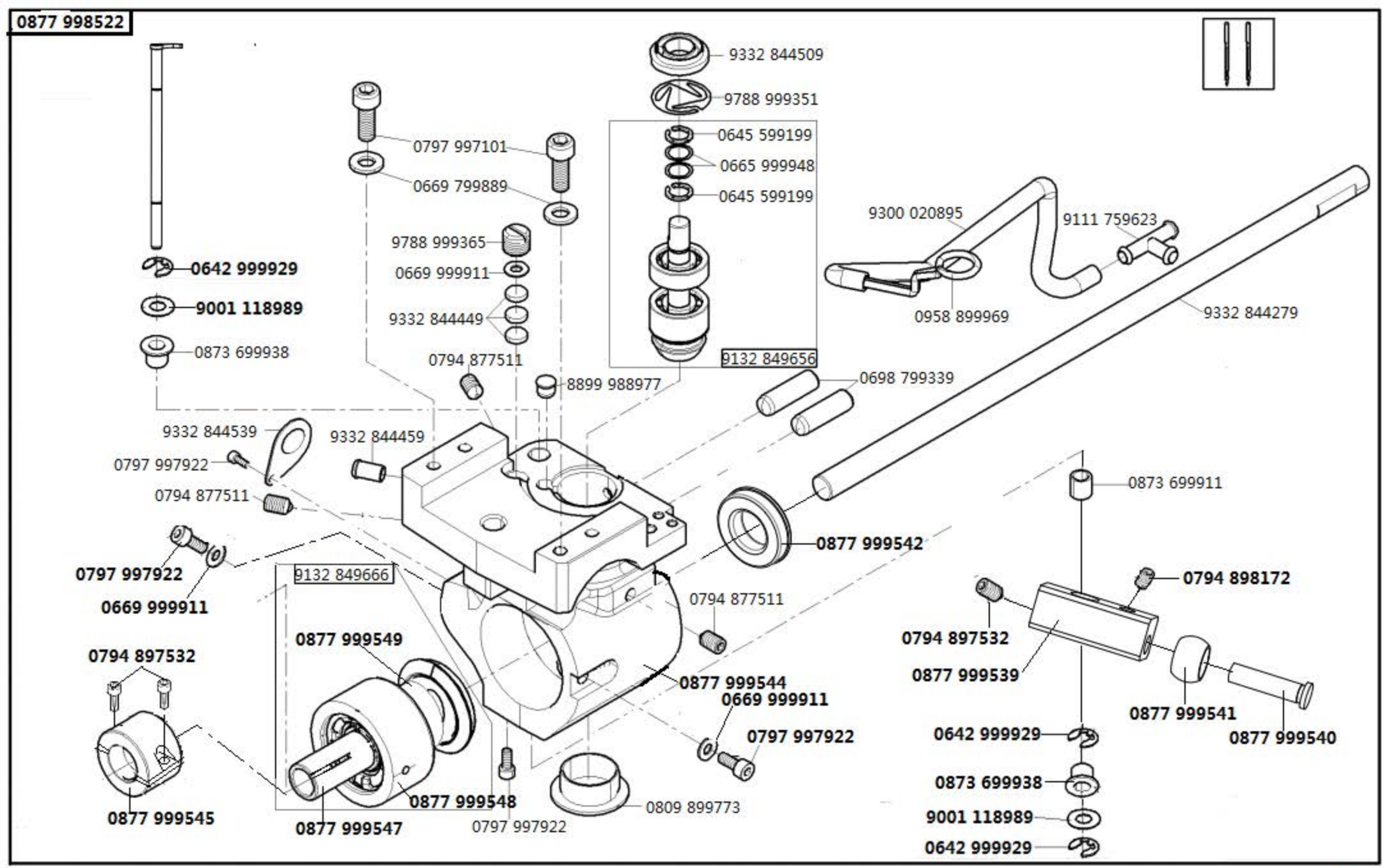
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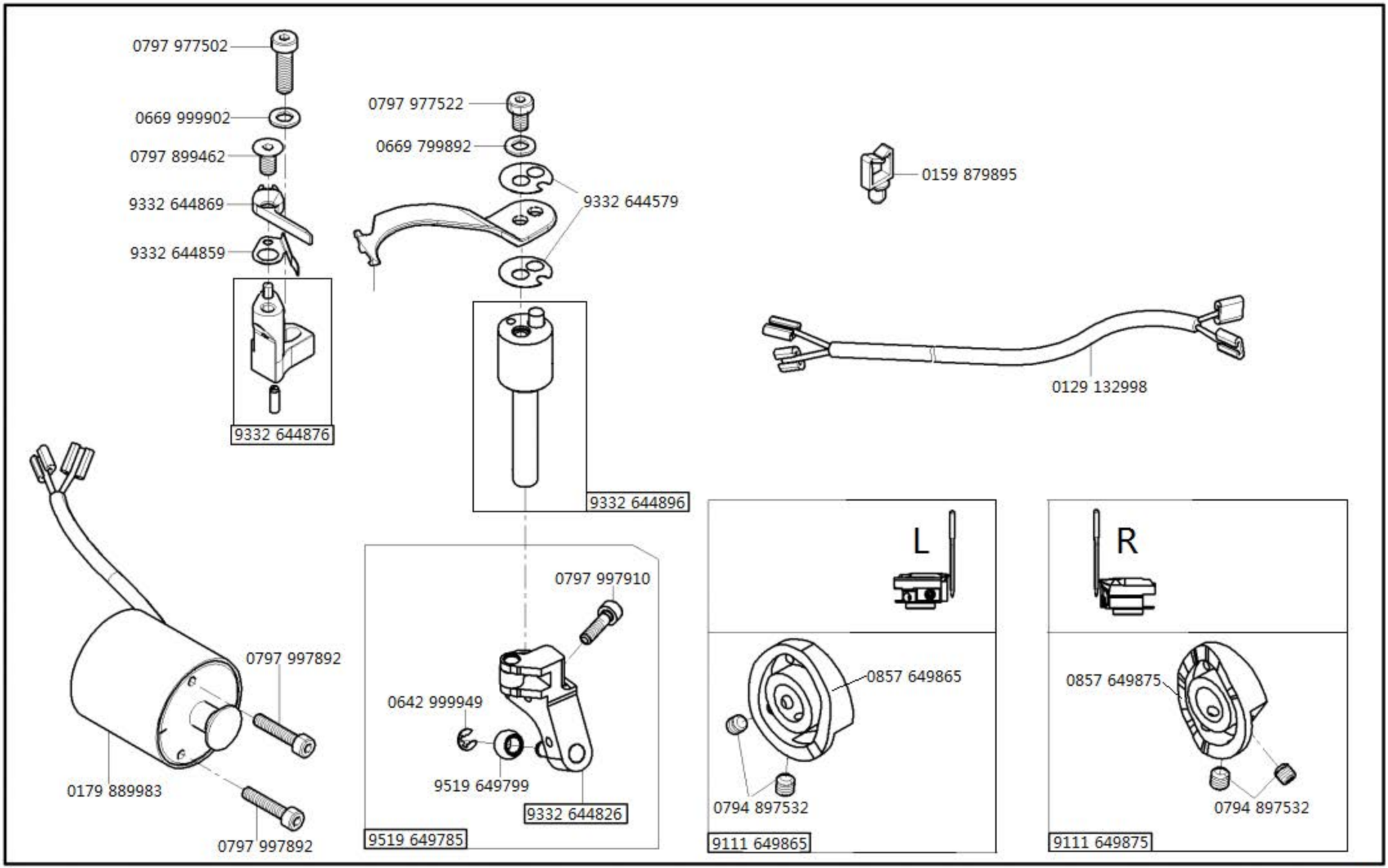
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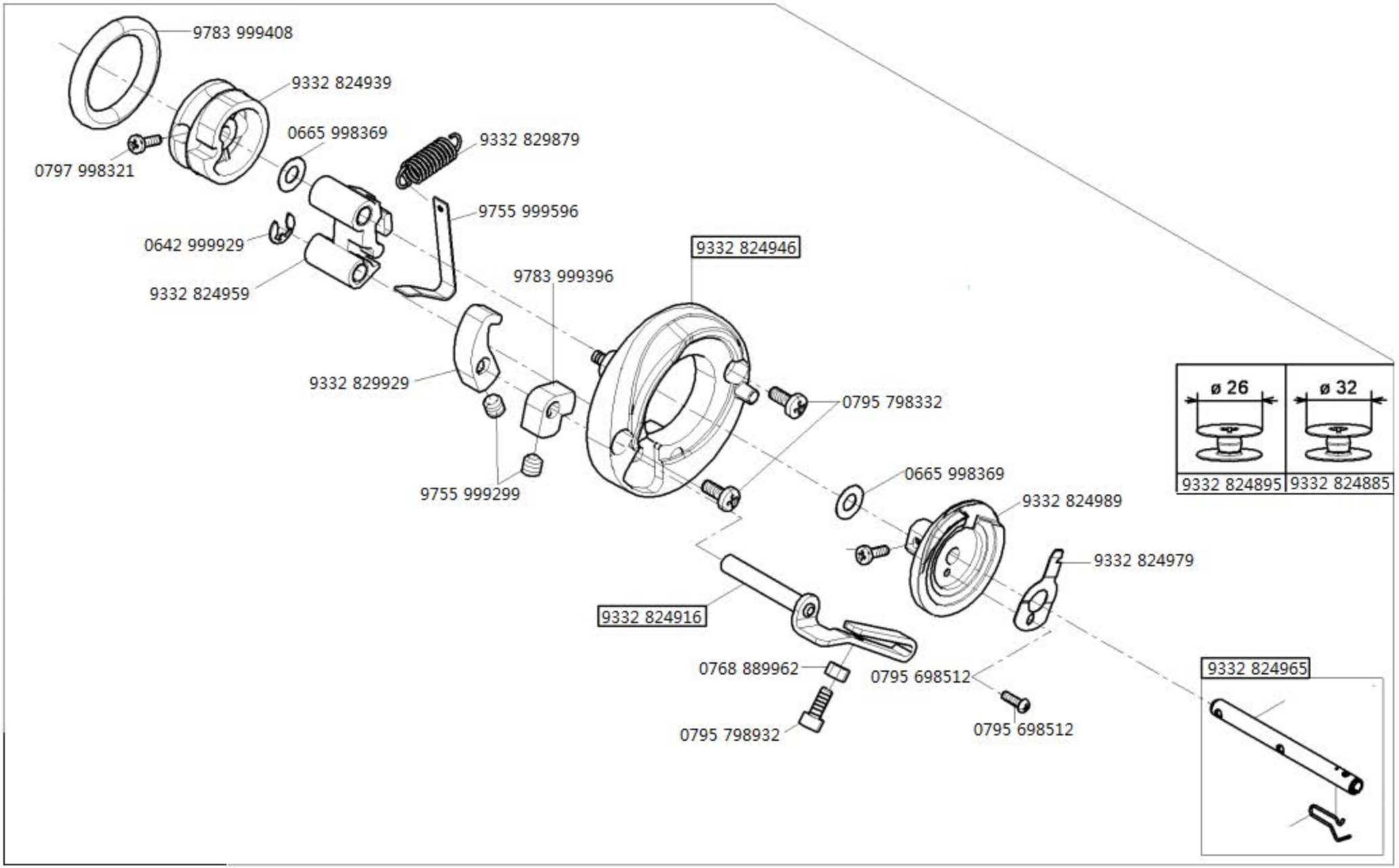
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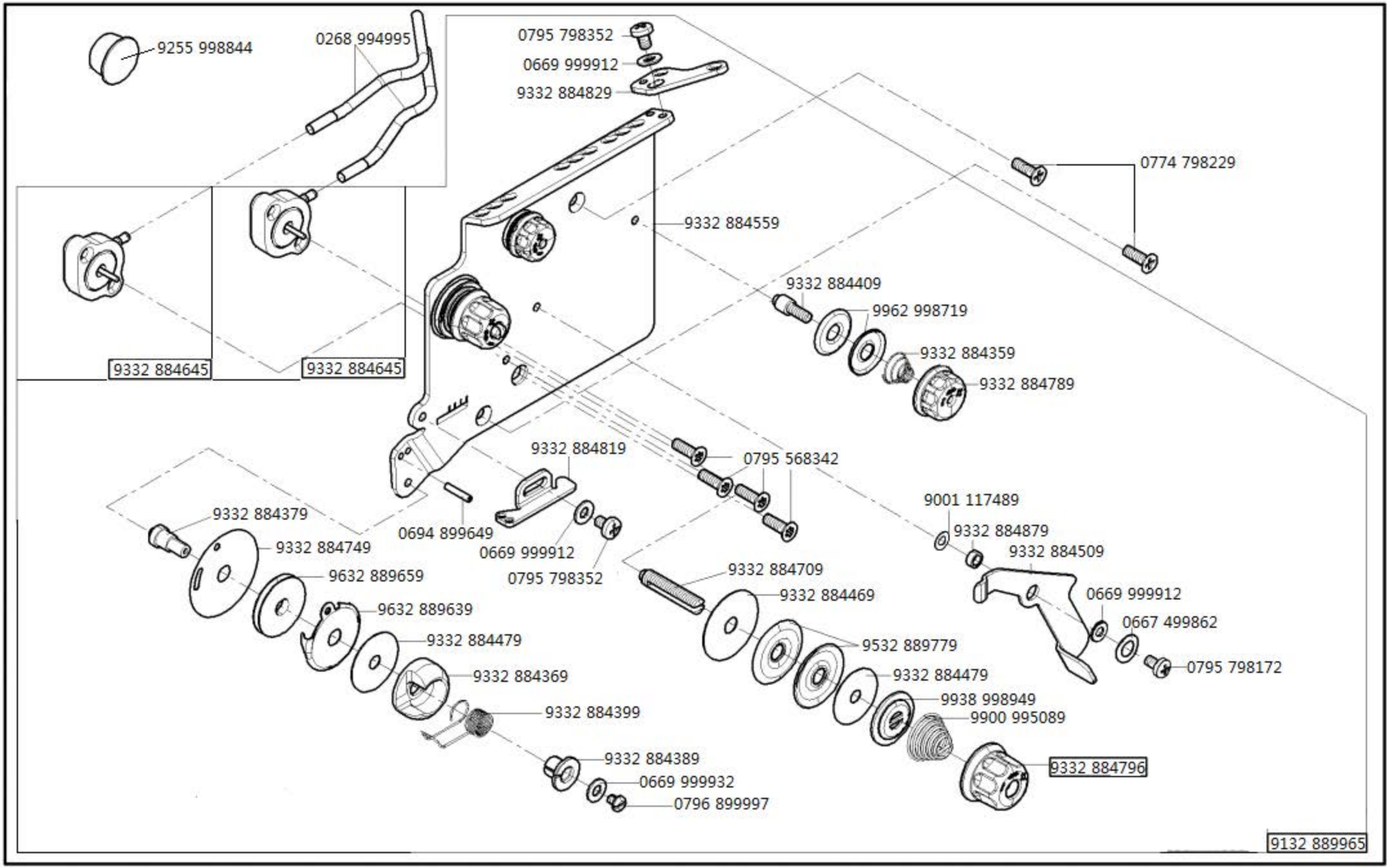
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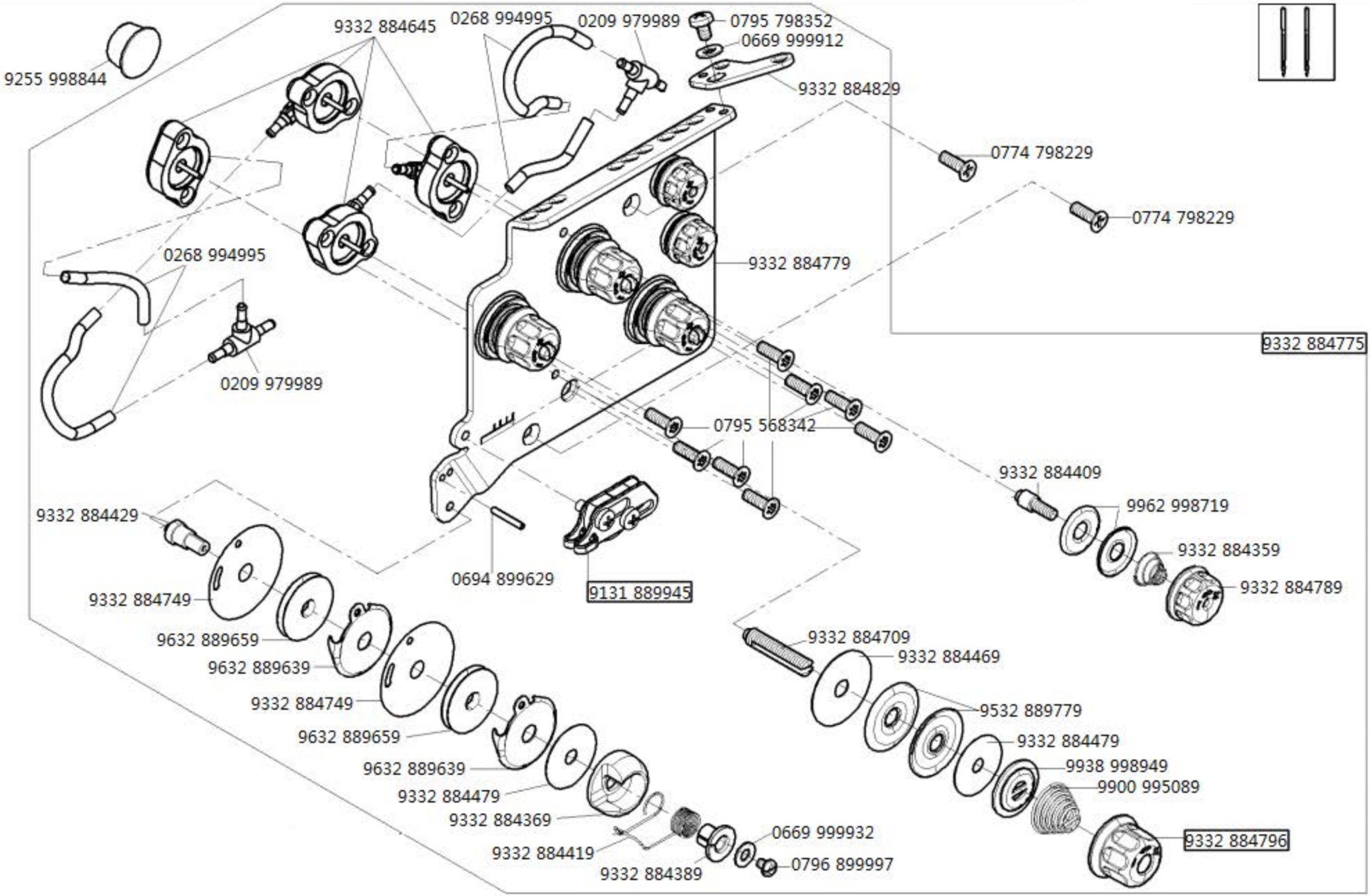
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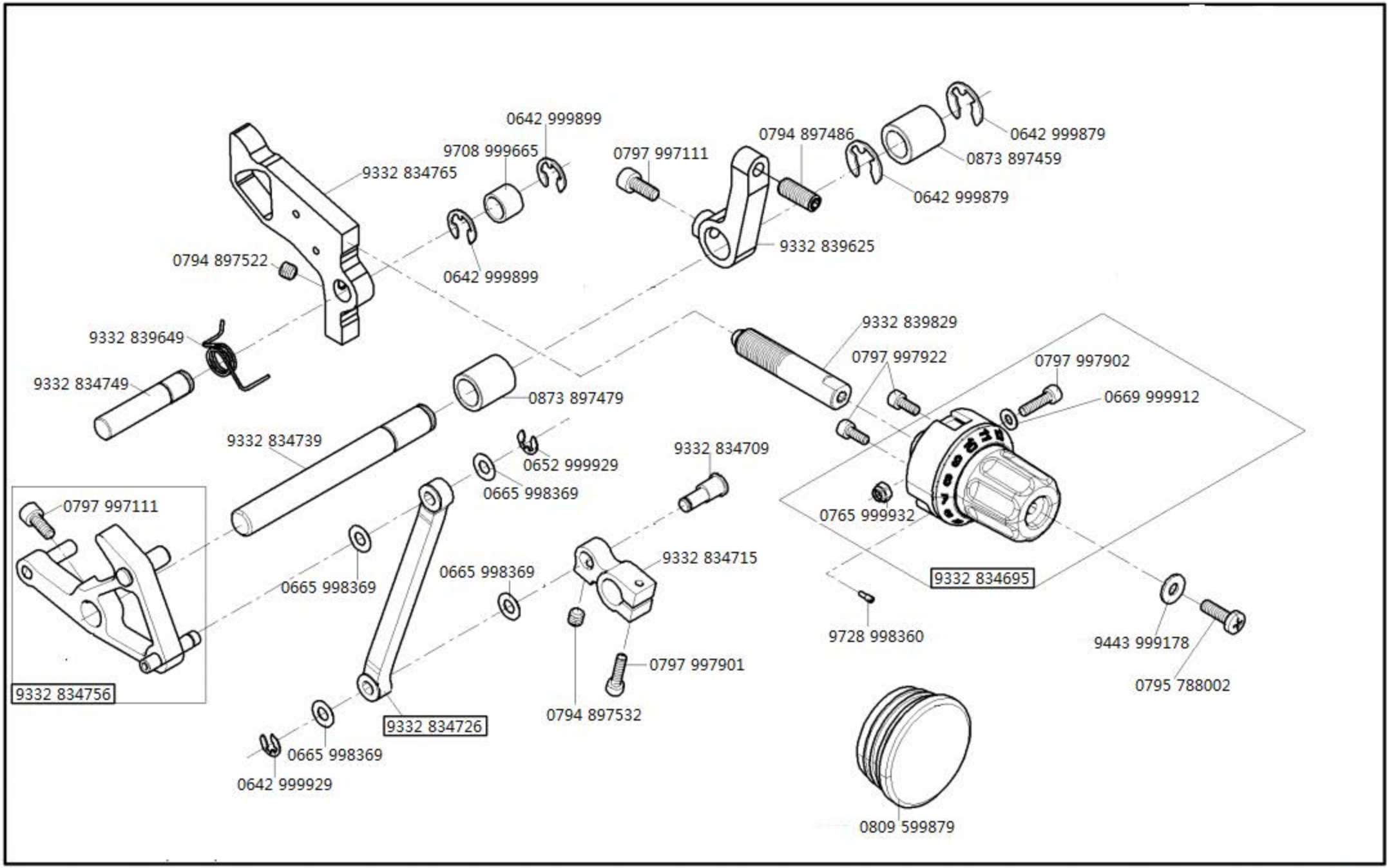
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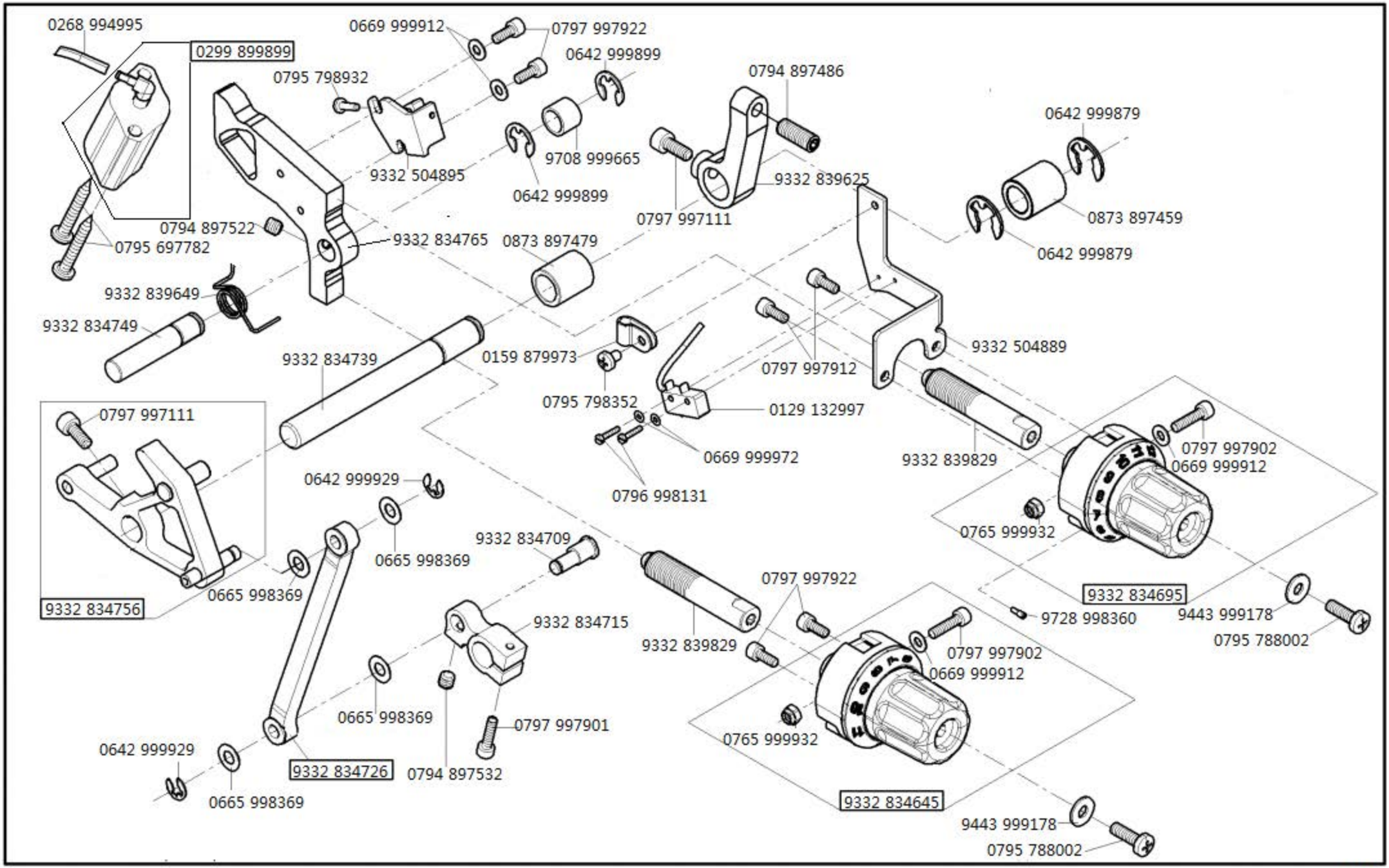
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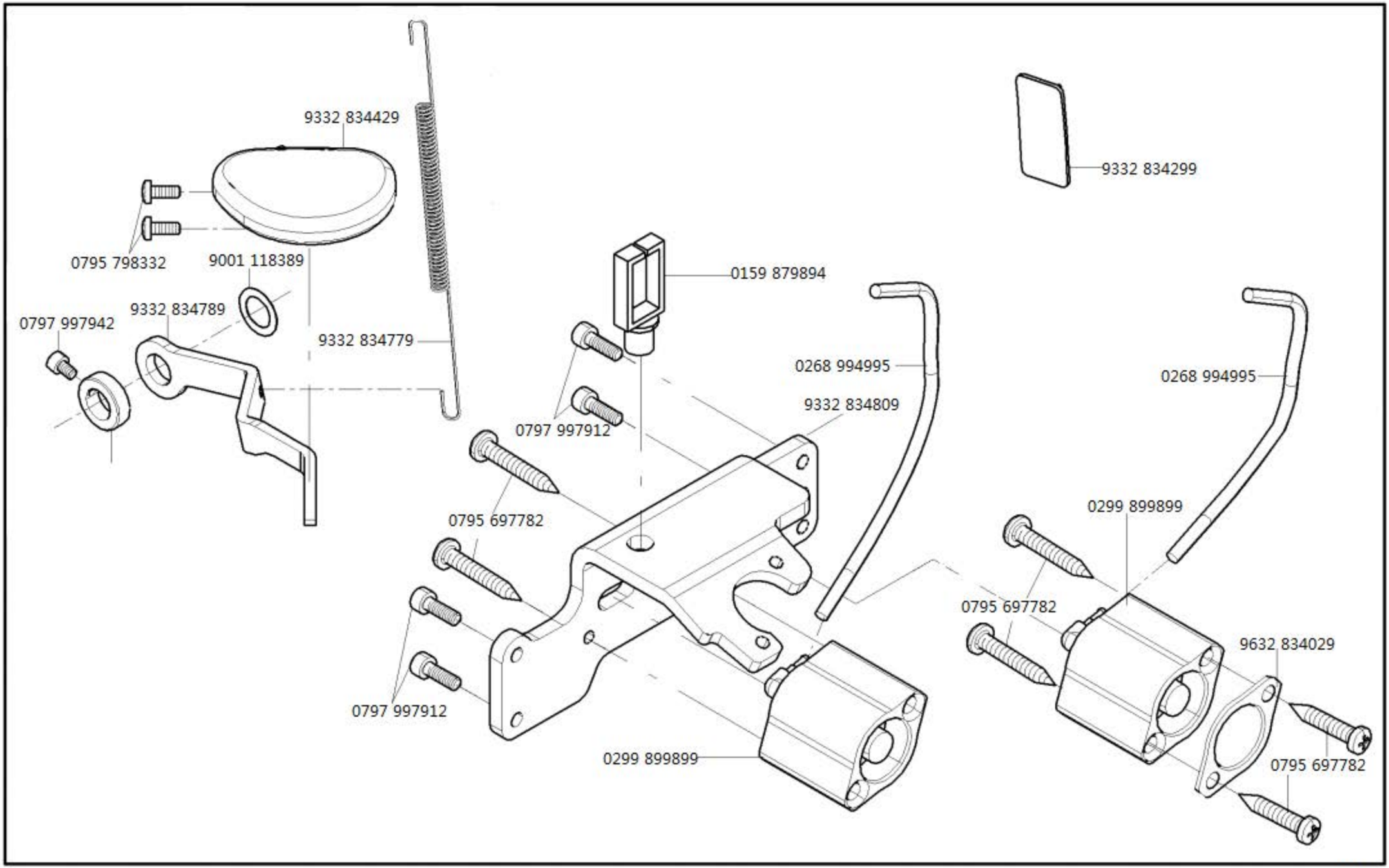
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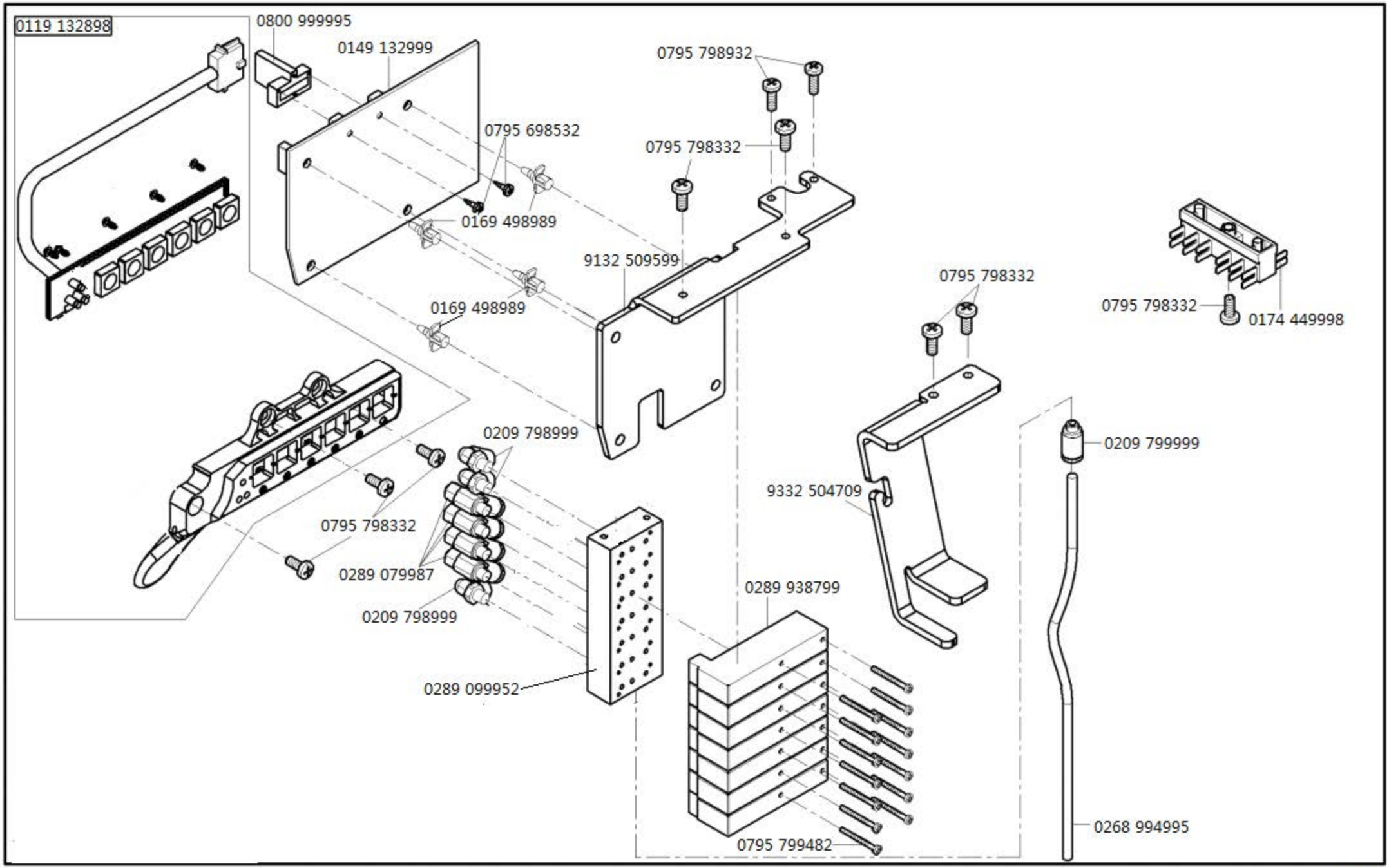
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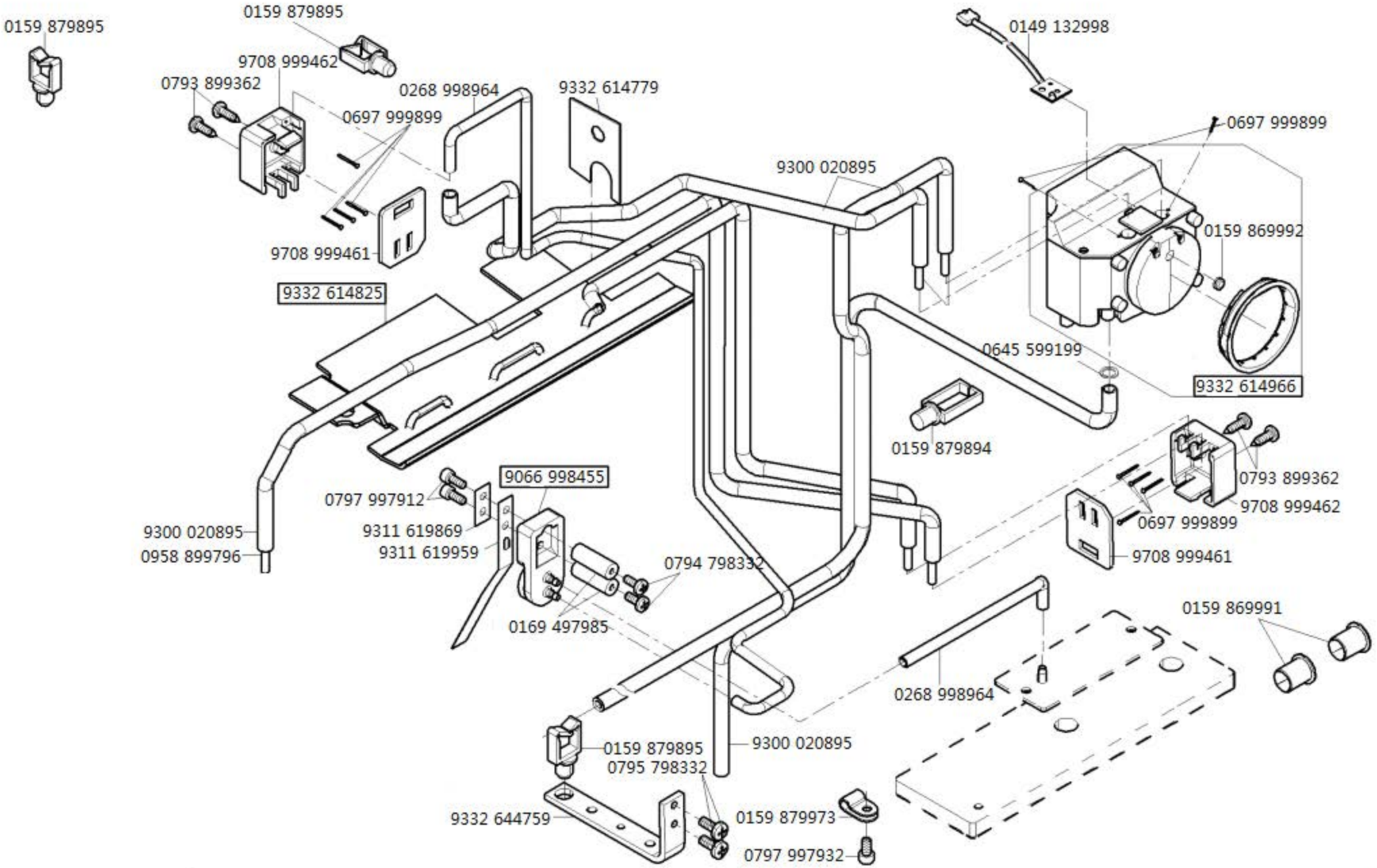
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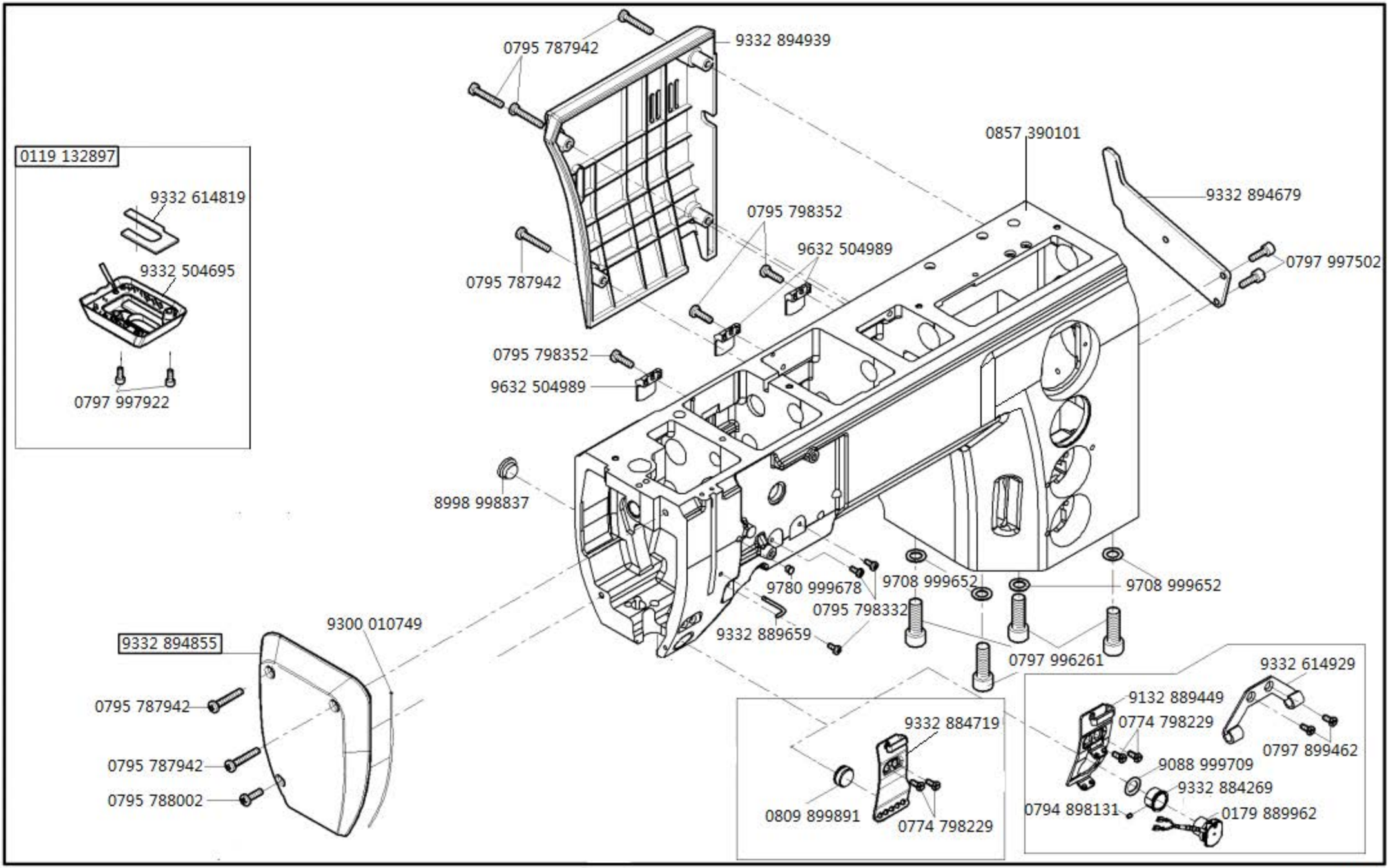
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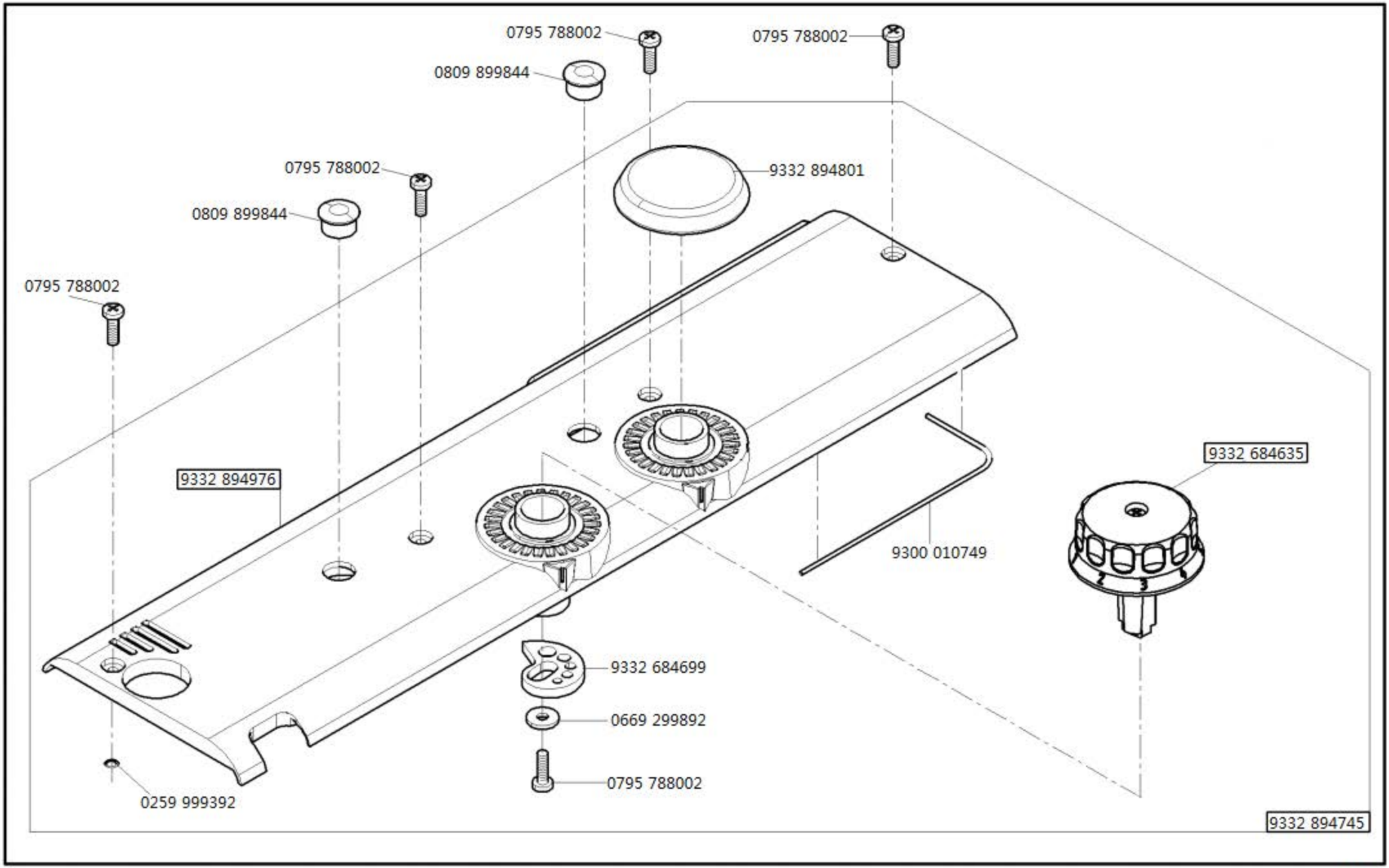
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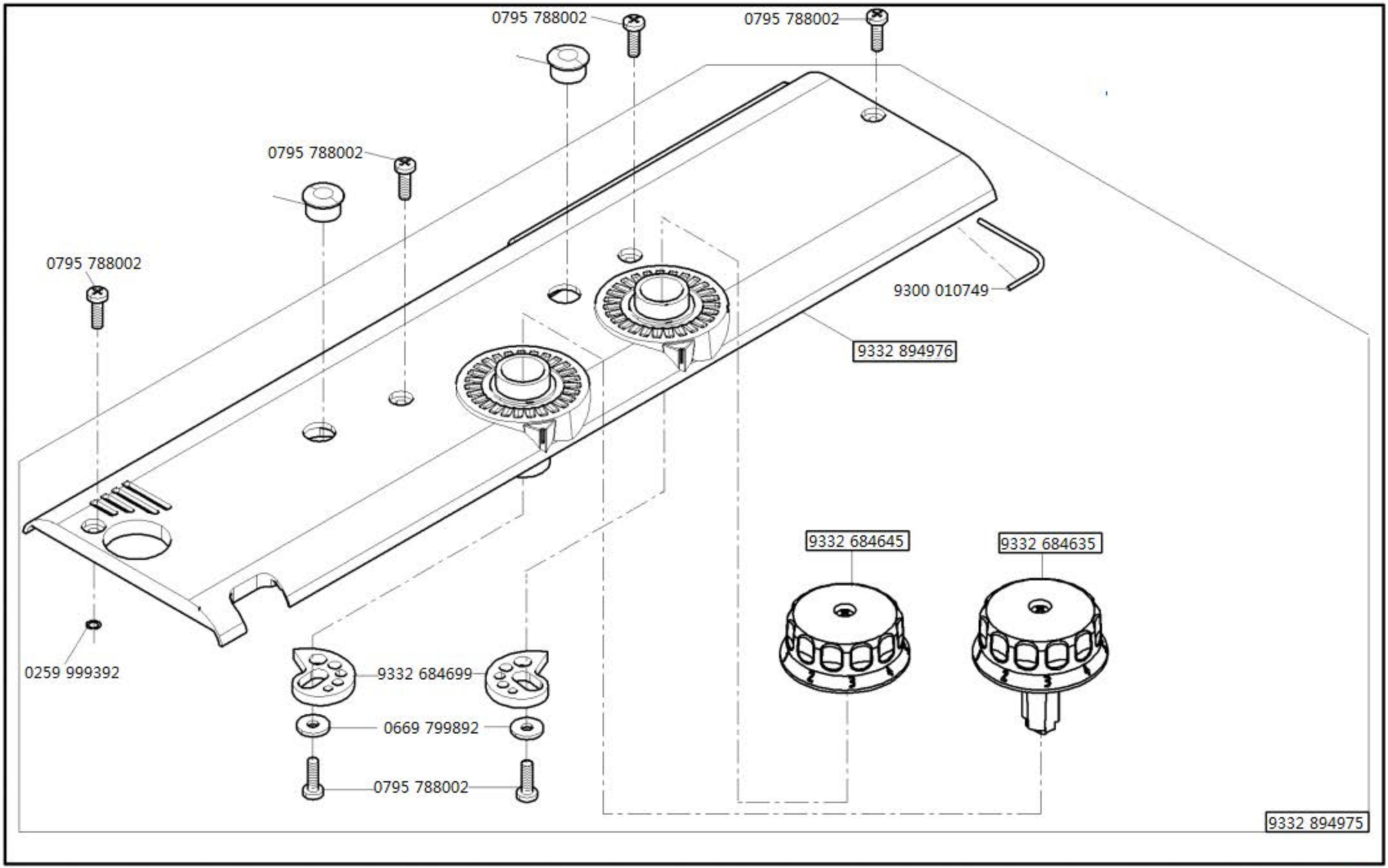
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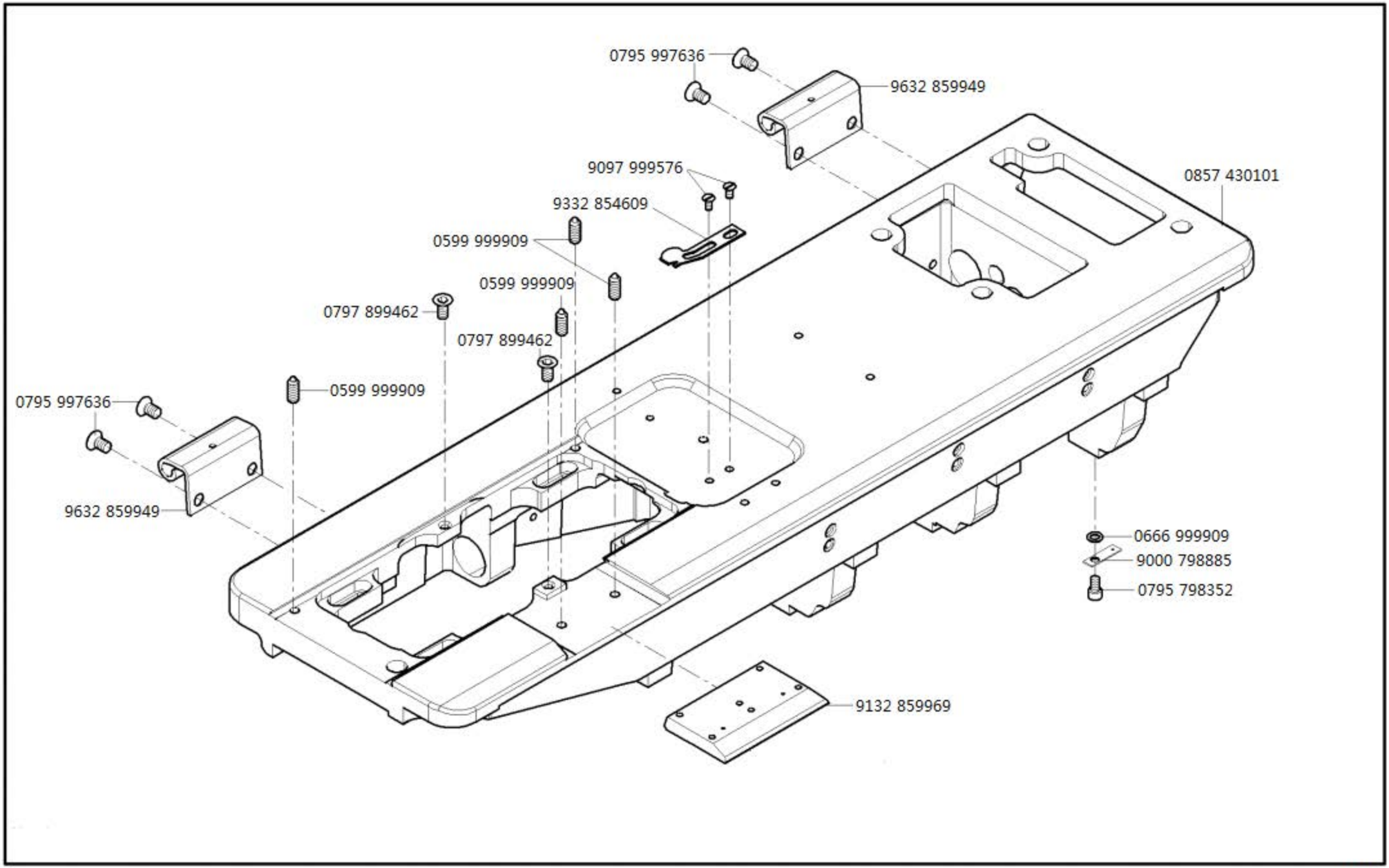
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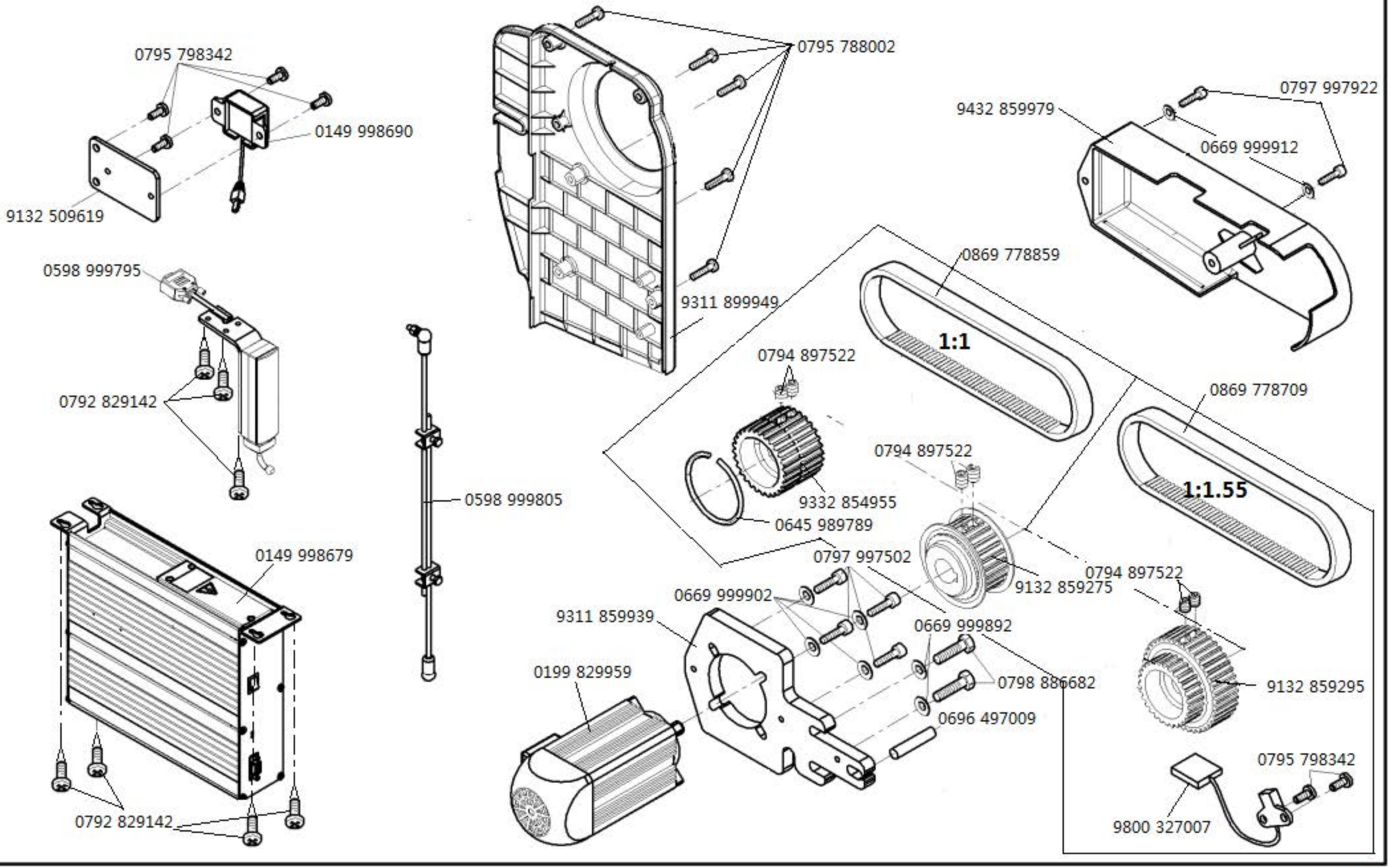
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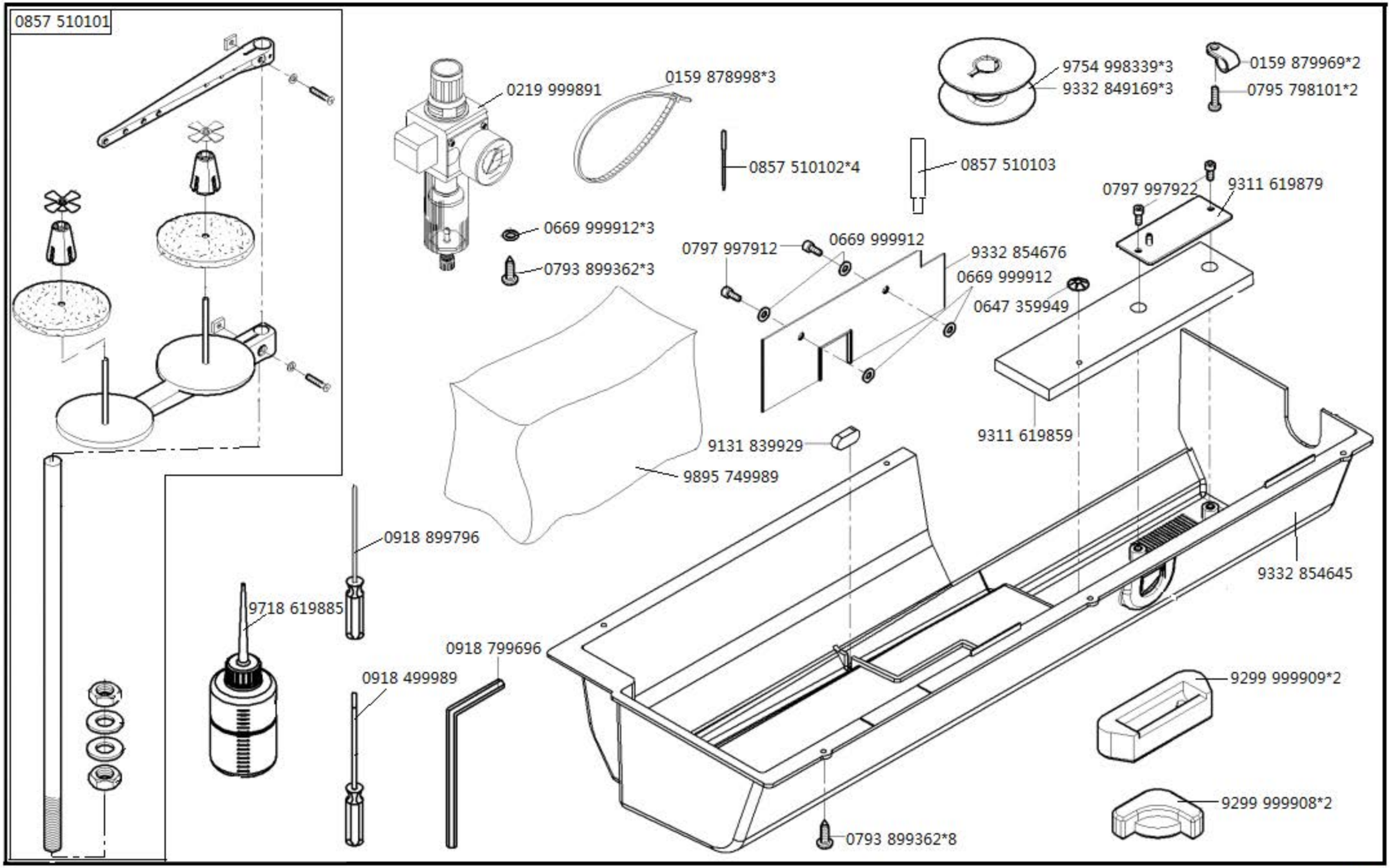
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