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the world of motorcycles

SE
MOTORCYCLES

# Assembly instructions and safety instructions

# for

**Gabel-Cartridge System SE-50-12001-01-003 für BMW 36 mm Twinshock fork**

**Gabel-Cartridge System SE-50-12002-01-003 für BMW 36 mm Twinshock fork**

**Gabel-Cartridge System SE-50-12005-01-003 für BMW 38,5 mm Monolever fork**

**Gabel-Cartridge System SE-50-12004-01-003 für BMW 41 mm Paralever fork**

# Attention

## Important safety information:

- Work on the steering and brake system poses a safety risk. This work may only be carried out by appropriately qualified persons. Incorrect work can have serious consequences and possibly endanger life and health. Only carry out this assembly if you are qualified to do so and have an official workshop manual as well as all relevant service bulletins. Otherwise, we strongly advise you to have the installation, or at least the inspection of the installation, carried out by a specialist workshop.
- Brake fluid is toxic and can damage the surfaces of the fairing and other components. Protect all components from damage with suitable means. Observe all safety instructions of the brake fluid manufacturer.
- only use fresh brake fluid from a sealed container. Always use new sealing rings that meet the specifications of the line manufacturer. Never combine copper sealing rings with connections made of aluminium.
- ABS brake systems should only be bled at a workshop authorised by the vehicle manufacturer.
- When fitting, removing and tightening original parts, always proceed in accordance with the workshop manual.
- To ensure a safe function, it is essential that all contact surfaces of clamp connections are clean, dry and free of damage during assembly. Make absolutely sure that nothing gets onto these contact surfaces that reduces friction (e.g. oil, silicone, care products, etc.).
  (e.g. oil, silicone, care products, etc.).
- Be sure to tighten all clamping screws with torque. The torque specifications refer to dry screws and threads. The tightness of all screw connections must also be checked during every inspection.
- It is your responsibility to check the product regularly and determine if service or replacement is necessary.
- Please remember that the triple clamp is a safety-relevant component of your vehicle. After a crash or impact, check the handlebar, riser and triple clamp and replace them completely if there is the slightest sign of damage.
- Never lash the vehicle to the handlebars.
- This product is designed for a production vehicle. Sport-Evolution does not accept any liability or guarantee for any damage resulting from the combination with other accessories not tested by Sport-Evolution, as a result of improper installation or lack of maintenance.

## Preparation

- Read the safety instructions and the assembly instructions completely and carefully.
- An insecurely positioned motorbike may fall over during the following work. Therefore, make sure that the motorbike is on firm, level ground and secured against falling over and rolling away.
- Keep children and pets away from the work area.
- Protect dismantled components from damage.
- Never remove the upper triple clamp without taking the weight off the front wheel, otherwise the lower triple clamp may be damaged.
- When dismantling individual parts, note which screws are used to fasten them. Keep these components and screws and, unless otherwise stated, reuse them accordingly when reassembling.

## Final control

- Ensure that all controls on the handlebars are in the correct position, even when the handlebars are fully turned. The hitch and the reservoir must be in the correct working position.

- Ensure that the handlebars and their attachments are free to move and that there is sufficient steering angle to each side. The handlebar must move easily from steering stop to steering stop. Check the free play of the throttle cables: With full steering angle on both sides and the engine running, the engine speed must not change.

- After completing the work, check all components and screws for tight fit, function as well as tightness. Make sure that there is enough brake fluid in the reservoir. Also test the freewheel of the front wheel and the function of the brake system. Likewise, check the function of the clutch, the throttle grip, the electrical system and the anti-theft devices.

- Afterwards, a test drive must be carried out! After the test drive has been completed, all bolted connections must be checked again for tightness, leaks and all moving parts must be checked for sufficient free movement. Re-test the front wheel freewheel and the brake system for overheating. Check the brake fluid level in the reservoir for significant changes.

- After approx. 100 km, check the tightness of all screw connections of the handlebar again with the specified tightening values.

Fork cartridge installation instructions:

The installation of the cartridge system requires specialist knowledge and professional tools, therefore visit a specialist workshop and have the installation carried out there.

ATTENTION: The function of the cartridge system can be impaired even by minor contamination in the µ range. Therefore, pay close attention to cleanliness during the work!

In addition to a well-equipped set of tools, you will need the following to install the system

- a torque spanner with ½ inch drive
- an air/impact wrench
- hot air gun

Package contents:

Cartridge system:
1 x rebound unit (overflow openings damping cylinder bottom) right bar
1 x compression unit (overflow openings damping cylinder top) left bar
1 x SAE 5 fork oil 1 ltr.

1. removal of the original front fork
   a. Ensure that your motorbike is secure and stable.
   b. Raise the front of the motorbike using an assembly stand until the front wheel only lightly touches the ground
   c. Remove the brake calipers , front wheel and front mudguard.
   d. Unscrew the fork caps completely from the inner tubes. Use a ½ inch ratchet spanner and apply light pressure to the fork cap from above. Be careful as the spring is preloaded. Then loosen the screws of the lower triple clamp and pull the fork legs downwards out of the triple clamp.

2. dismantle original fork
   a. Remove the sleeves (preload sleeves) and the fork springs.
   b. Empty the fork oil from the fork leg into a suitable container and then dispose of it properly. Move the inner tube up and down several times so that the oil can flow out completely.
   c. Carefully remove the dust cap and the fork seal retaining ring underneath.
   d. From below, loosen the fork insert screw located in the outer tube. An air/impact wrench is helpful for loosening the screw, as otherwise the fork insert can rotate inside. When loosening the screw, pull the outer tube and inner tube apart with a slight pull.

e. Pull the two fork tubes apart. On some models, it is necessary to pull more forcefully, as the sliding bushings must also loosen. In these cases it is helpful to heat the upper part of the outer tube with a heat gun.
f. Remove the original damping unit, if necessary together with the spring.

Variant 36mm/38,5mm/40mm Fork

g. Remove the circlip from the guide sleeve in the inner tube.
h. Remove the original guide sleeve. The components f to g are no longer used.

Variant 41mm Fork

g. Clamp the inner tube in a lathe. Turn the flared edge so far that the guide bushing can be removed. Make sure that the groove of the Teflon bushing remains intact.
h. Remove the original guide sleeve. The components f to g are no longer used.

3. assembly of the fork cartridge
    a. Push the inner tube and outer tube back together.
    b. Then refit the fork seal ring, the circlip and the dust cap. We recommend replacing the fork seal rings. Use a suitable driving-in tool to mount the sealing ring.
    c. Dismantle the fork seal cap of the new cartridge, as well as the centring washer, the spacer sleeve and the spring and make the following basic adjustment.
    d. Turn the damping adjustment screws (slotted screwdriver) counterclockwise as far as they will go and then turn them in again by 8 turns.
    e. Turn the spring preload adjusters clockwise as far as they will go.
    f. *Now insert the new cartridge cartridges into the respective fork leg.* ***Insert the rebound damping into the right fork leg and the compression damping into the left fork leg. You can recognise the rebound stage by the fact that the openings of the cylinder tube are at the bottom (in the area of the fork foot).***
    g. Carefully insert the cartridge screw into the fork foot from below and then tighten it with a tightening torque of 25 Nm.
    h. Fill the fork leg with the recommended fork oil. The correct air chamber is only set after the bleeding process.
    i. First fit only the fork caps and turn them 4 turns on the piston rod.
    j. Then move the fork cap up and down with the piston rod until the damping is clearly noticeable.
    k. Then lower the inner tube and the piston rod completely. Using a dipstick, set the recommended air chamber and suck out excess oil or fill up to the specified level.

Variant 40mm/41mm Fork:

    l. Mount the components in the following order:
        fork spring
        centering washer
        spacer sleeve
    m. Pull the piston rod upwards as far as it will go and screw the
    Insert the fork cap until you feel a slight stop. Now lock the cable cap with the nut on the piston rod.

To do this, you have to push the spring down a little. Another hand is helpful here.

n. Slide the inner tube upwards and screw in the fork lock cover. Tighten it with a tightening torque of 10Nm. Set the adjustment screw for adjusting the damping and the spring preload to the recommended position respectively.
o. Reassemble the fork, front wheel, mudguard and brake calipers again.

Variant 36mm/38,5mm Fork:

l. Insert the fork leg from below into the fork bridge and push it up to the stop in the upper triple clamp. Tighten the clamping screws of the lower bridge with 20 Nm. Always keep the lower fork tube fixed in the stop, otherwise it can fall away downwards.

m. Pull the piston rod upwards until it stops and screw in the fork cap until you feel a slight stop. Now lock the cable cap with the nut on the piston rod. To do this, push the spring down a little. Another hand is helpful here.
n. Push the inner tube upwards and screw in the fork cap. Tighten it with a torque of 10Nm. Set the adjustment screw for adjusting the damping and the spring preload each to the recommended position.
o. Reassemble the fork, front wheel, mudguard and brake calipers.

Basic setting:

The mode of operation of the adjusters is as follows: The damping of the compression and rebound damping increases clockwise and decreases anticlockwise. Information on their setting always means from to, i.e. turned fully clockwise to a perceptible stop, to up.
The spring preload decreases when turned clockwise and increases when turned anticlockwise. Information on its setting always means from open, i.e. turned all the way to the right up to a perceptible stop, to closed.
Basic setting:

| | |
|---|---|
| Rebound: | 4 Turns |
| Compression: | 4 Turns |
| Spring pre-load: | 8 Turns |

Oil volume or air cushion: more comfort 150 mm
Sporty driving (higher braking stability) 120mm

Spring preload adjustment

Basic setting 8 revolutions
More comfort, better turn-in behaviour: 8 revolutions

Sporty driving, higher braking stability: 12 revolutions

Rebound damping setting

Basic settings 4 revolutions

More comfort: 6 revolutions

Sporty driving:  2 revolutions

Adjustment of compression damping
Basic setting  4 revolutions
More comfort: 6 revolutions
Sporty driving:  2 revolutions

Please proceed carefully. Improper installation can lead to serious accidents as well as damage to the vehicle. Please note that we cannot accept any warranty for vehicle-specific tolerances. It may be necessary to adjust our product in individual cases. Please have work on safety-relevant components (e.g. brakes, wheels, lines, chassis) carried out by qualified personnel only. These installation instructions have been prepared by us to the best of our knowledge, all information is without guarantee. We recommend that you regularly check and, if necessary, retighten all screws that are not secured. Make sure that the free movement of your handlebar and the wheels is guaranteed at all times.

***Note:***
***A fork damping system must be run in for approx. 500 km. It is only in the course of this period that the final, slight slipperiness and the sensitive response behaviour become apparent. Slight grinding or squeaking noises may occur during the first 1,000 km.***

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**Adjust fork filling, oil quantity, air cushion**

**Special accessories:**

folding ruler or tape measure

**Procedure:**

1. jack up the motorbike and take the weight off the fork or alternatively remove the fork leg according to the manufacturer's instructions.
2. Dremove the spring bearing / fork lock cover of the upper fork. Depending on the version, this is screwed on or fixed with a circlip. **Caution:** The cover is under tension due to the pre-tensioned spring. When removing the cover, it is therefore essential to ensure sufficient counterpressure during unscrewing / removal.
3. Remove the original sleeve (not on all models) and the spring upwards.
4. Open the drain plug of the fork (at the bottom of the fork tube according to the manufacturer's instructions) and drain the old fork oil.
   Tip: Slightly extend and retract the fork so that the oil also drains completely from the inside of the fork.
5. Close the drain plugs again and pre-fill 150 ml per fork leg.
6. dip the fork in and out several times to bleed the fork.
7. lower the front of the motorbike / fork completely, or push the inner and outer tubes together completely.
8. adjust air cushion / oil level: The oil level is the measurement between the top edge of the upper fork tube and the oil level inside the fork. This can be easily measured with a folding ruler or tape measure.
9. procedure: If the measurement is too high, top up with oil, if it is too low, drain the oil.
   Tip: If there is too much oil in the fork, the easiest way to suck it out is with a syringe and a small hose.

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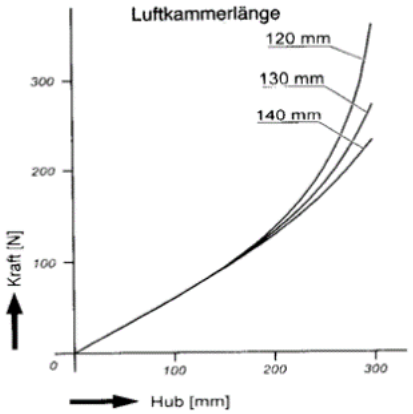
The progression of the fork can be changed via the size of the air cushion (oil level). A higher progression means a harder fork towards the end of the suspension travel. This has an effect, for example, during hard braking manoeuvres or when the fork sags (fork goes into the end stop).

**Air cushion / oil level**:

- more comfort 150 mm
- more reserves 120mm (higher braking stability)

The diagram illustrates the development of the forces in the course of the travel of a suspension fork. It is easy to see how this force changes towards the end of the travel as the air chamber changes.




10. The next step is to insert the fork spring (lower position), followed by the preload sleeve (upper position).
11. Reassemble the upper spring bearing / fork lock cover with any original parts (washers) in the reverse order of removal.
12. jack down the motorbike or re-install the fork legs in the chassis.

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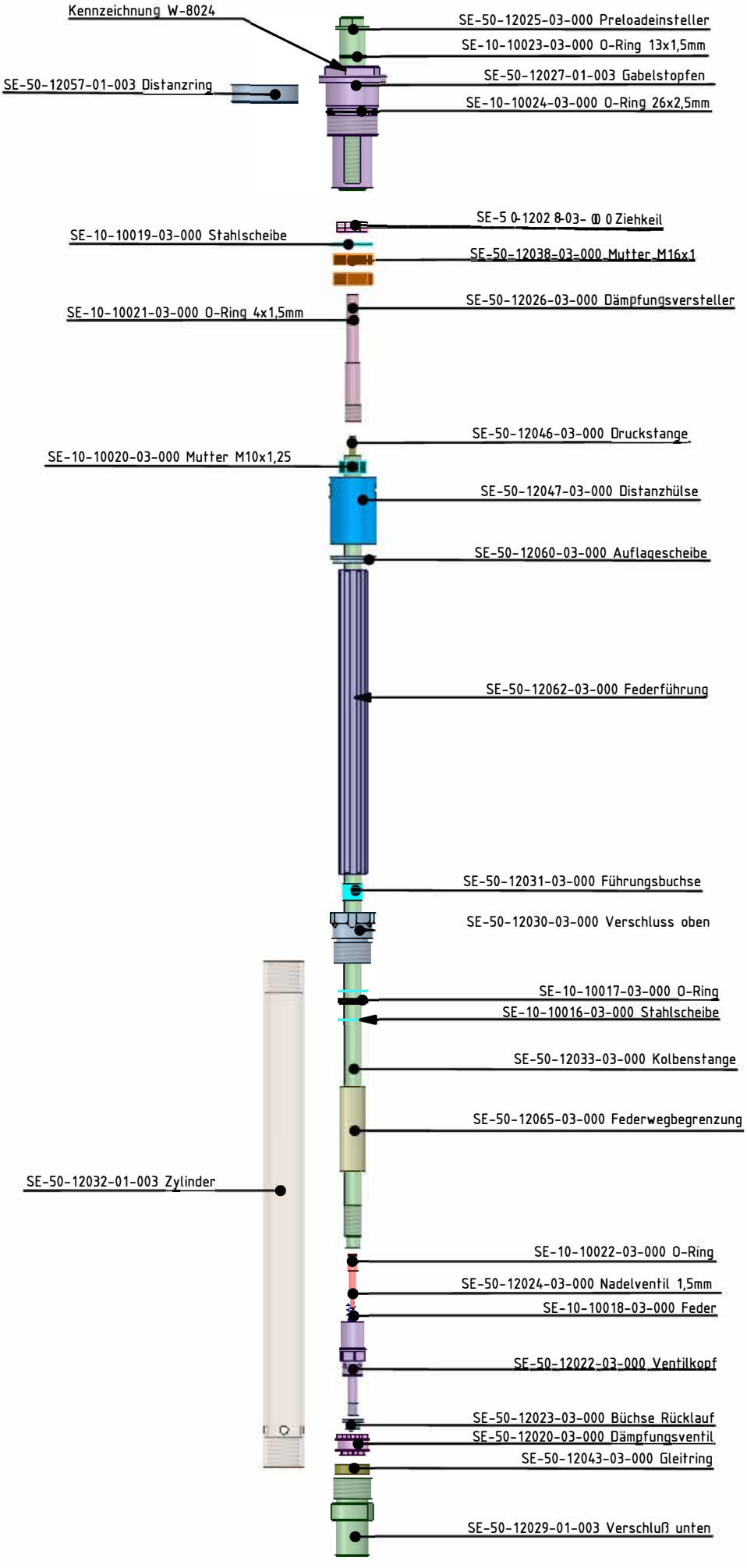
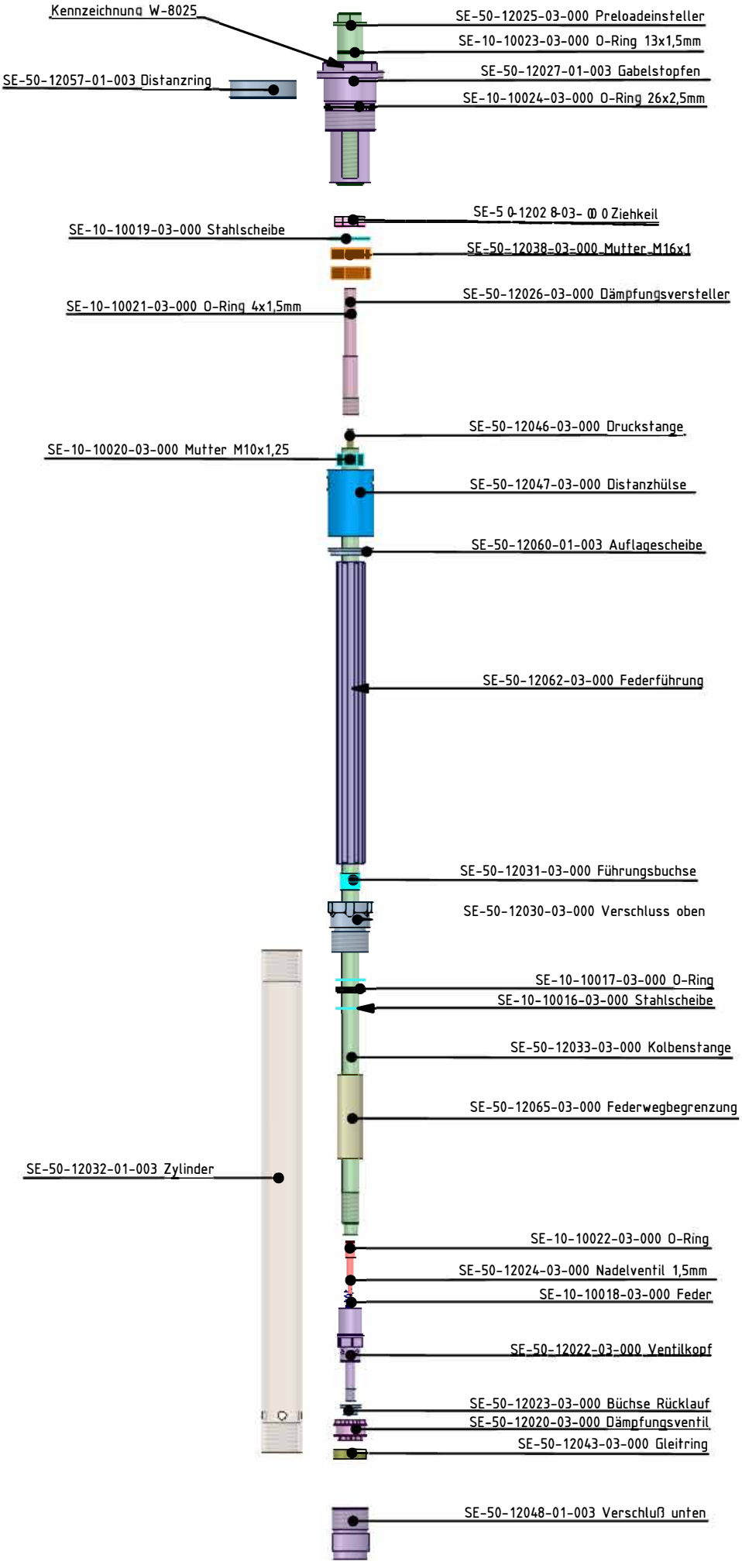
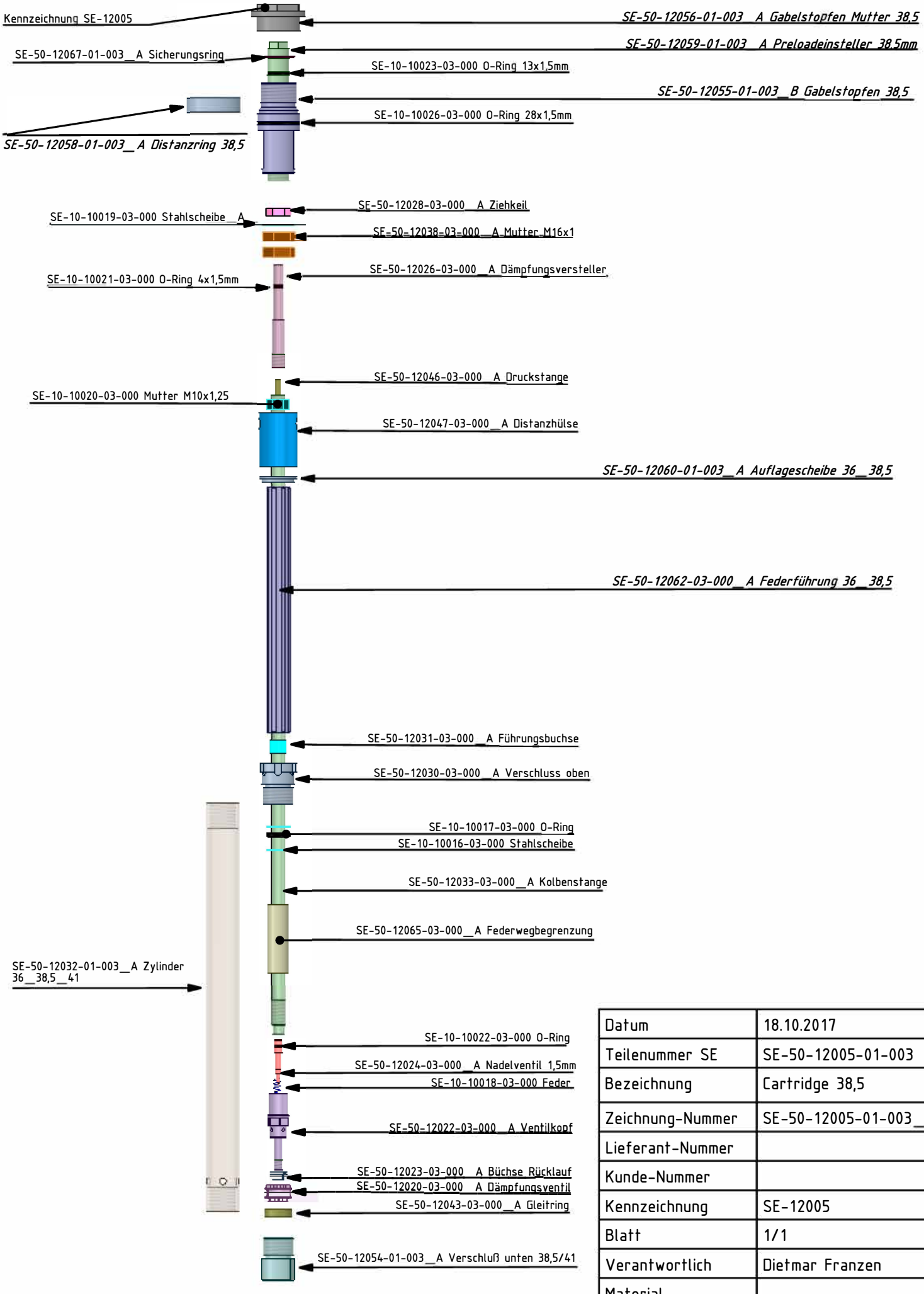


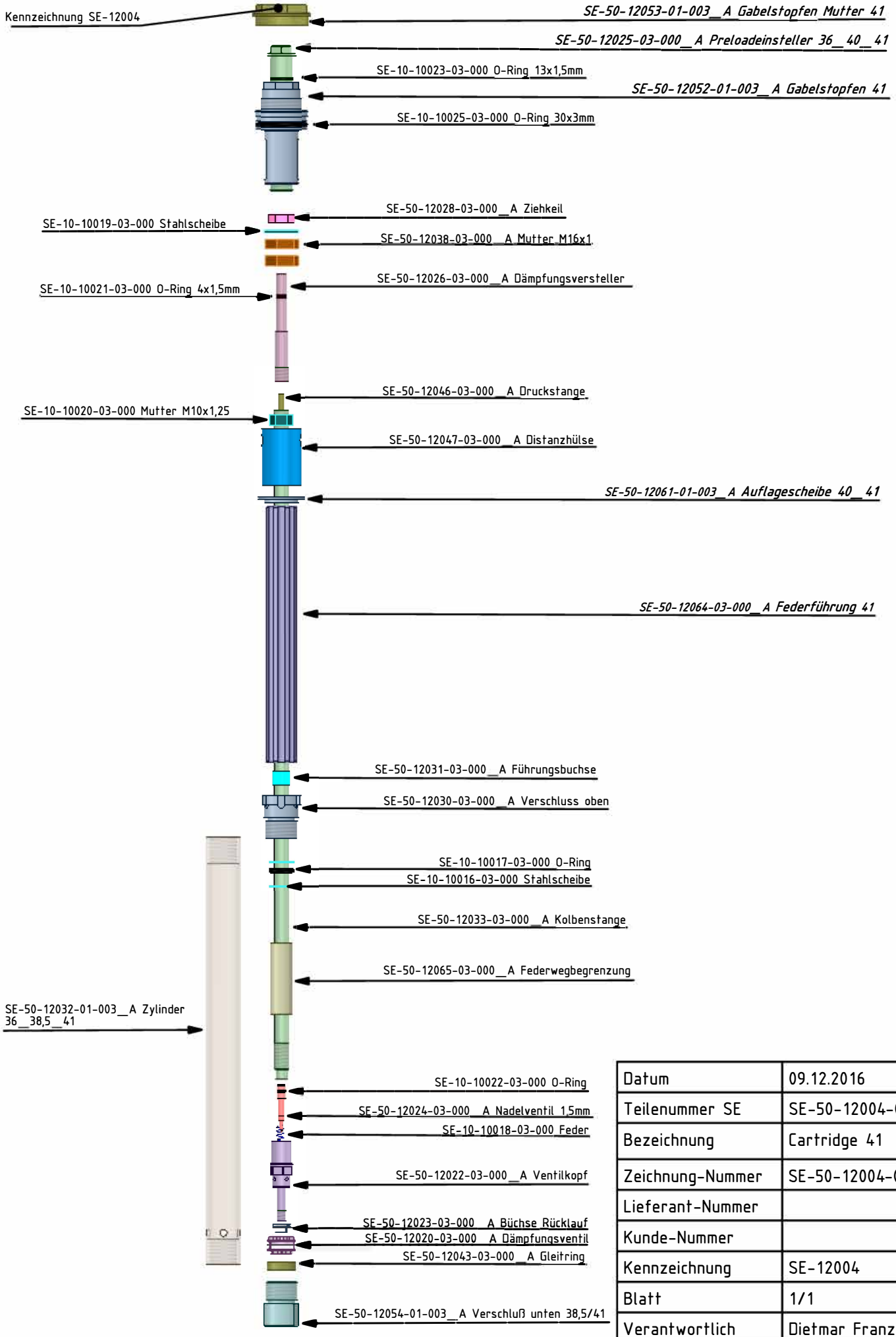

| | |
|---|---|
| Datum | 09.12.2016 |
| Teilenummer SE | SE-50-12001-01-003 |
| Bezeichnung | Cartridge |
| Zeichnung-Nummer | SE-50-12001-01-003/1 |
| Lieferant-Nummer | |
| Kunde-Nummer | |
| Kennzeichnung | SE-12001 |
| Blatt | 1/1 |
| Verantwortlich | Dietmar Franzen |
| Material | |
| Anmerkung | 36mm Gabel mit Schingsattelbremse |




| | |
|---|---|
| Datum | 09.12.2016 |
| Teilenummer SE | SE-50-12002-01-003 |
| Bezeichnung | Cartridge |
| Zeichnung-Nummer | SE-50-12002-01-003/1 |
| Lieferant-Nummer | |
| Kunde-Nummer | |
| Kennzeichnung | SE-12002 |
| Blatt | 1/1 |
| Verantwortlich | Dietmar Franzen |
| Material | |
| Anmerkung | 36mm Gabel mit konventioneller Bremse |




| | |
|---|---|
| Datum | 18.10.2017 |
| Teilenummer SE | SE-50-12005-01-003 |
| Bezeichnung | Cartridge 38,5 |
| Zeichnung-Nummer | SE-50-12005-01-003__B |
| Lieferant-Nummer | |
| Kunde-Nummer | |
| Kennzeichnung | SE-12005 |
| Blatt | 1/1 |
| Verantwortlich | Dietmar Franzen |
| Material | |
| Anmerkung | 38,5 mm Gabel |




| | |
|---|---|
| Datum | 09.12.2016 |
| Teilenummer SE | SE-50-12004-01-003 |
| Bezeichnung | Cartridge 41 |
| Zeichnung-Nummer | SE-50-12004-01-003__A |
| Lieferant-Nummer | |
| Kunde-Nummer | |
| Kennzeichnung | SE-12004 |
| Blatt | 1/1 |
| Verantwortlich | Dietmar Franzen |
| Material | |
| Anmerkung | 41 mm Gabel |