Einbauhinweise / Installation Instructions			KW automotive	
Hinweis Nr./ Instruction No.	686 71 002		Erstellt am/ Date	20.02.2006

KW automotive

EINBAUHINWEISE

Vor der Fahrwerksmontage ist folgendes in jedem Fall zu beachten:

- **Das Gutachten muss mit den technischen Daten des Fahrzeugs übereinstimmen (VA- und HA-Last, Leistungsbereich, Fahrzeug Typ Nr. und ABE EG Nr.).**
- **Die Fahrwerkskomponenten müssen mit dem Gutachten übereinstimmen (Feder - und Federbeinkennzeichnung).**
- **Die Einbauhinweise sind genau einzuhalten.**

Bei der Entwicklung von KW Gewindefahrwerken wird auf eine möglichst einfache Handhabung geachtet. Sofern dies nachfolgend nicht abweichend beschrieben ist, werden alle Fahrwerkselemente gemäß den Richtlinien der Fahrzeughersteller aus- und eingebaut. Irrtümer und Änderungen vorbehalten. Aktuelle Einbauanleitungen unter www.kw-gmbh.de.

INSTALLATION INSTRUCTIONS

Before you start installation work, please read the following carefully:

- **Ensure that the TUEV certificate matches the vehicle specifications (front and rear axle weights vehicle identification number (VIN)) etc...**
- **The suspension components must match the suspensions application specifications (springs and shock/struts identification numbers).**
- **The instructions have to be strictly observed.**

KW Coilovers for automobile suspensions are designed for easy installation. If not otherwise stipulated in these instructions, all suspension components are installed and removed in accordance with the manufacturer's specifications for installing and removing standard springs and damper components. At the time of printing all instructions and specifications are correct. However please check with your local KW dealer or the KW website www.kwsuspensions.com (US-program only) www.kw-gmbh.de(European program) for the latest updates.

KW automotive

Set Up Manual KW-Variant 3

No. 685 77 021

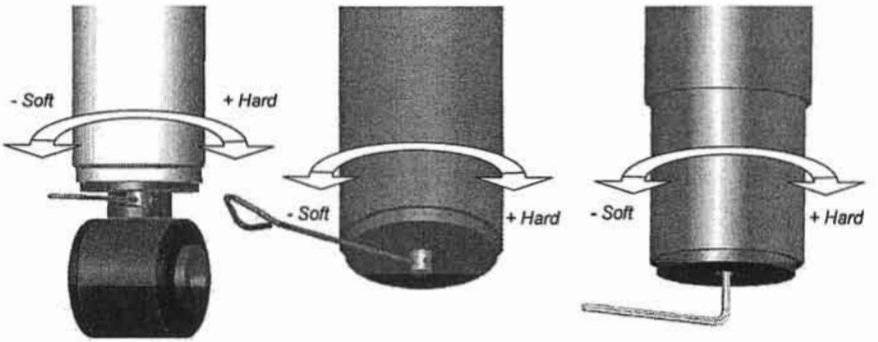
Our 2-way adjustable competition shock absorber is based on the KW twin tube damping system, and features independent bump and rebound adjustment. Depending on the sealing and the adjusting system of the individual kit, our systems may be charged with pressures of 3 to 8 bars, or without any pressure at all.

Adjusting the Bump/compression:
The compression forces can be adjusted on our patented 2-way bottom valve. Access to the bump valve in most instances is found on the bottom of each shock case. Hardness adjustment on the rebound valve is made on the end of the piston rod with the supplied setting wheel or with a 2mm Allen key.

Adjusting Bump:
Bump forces, especially on low damper speeds, have a great influence on handling and driving behaviour of your car. The setting of the bump forces will be made from the bottom of the shock case. Behind the adjusting grove you gain access to a knob with 4 holes. With the supplied small pin, the adjusting knob can be turned a quarter per turn in either direction. Smaller increments are possible.
Before performing any adjustments, the valve must be closed by turning the adjuster in the full clockwise direction or clicks. In this position, the shock will be at full hard, or "maximum power". From here, the adjustment range is 4 x ½ turns (2 full revolutions).
To avoid the mismatch of the dampers when actively changing settings, you should close the valve from time to time to re-calibrate the settings from side to side.

Bump adjusting principles:
Generally, hard low speed bump settings will stabilize the corresponding axle (less over steer on the rear, for example) or offer the front a more precise steering response. Too much low speed bump power will decrease grip!
Depending on the valve configuration found inside the kit, maximum bump forces will not influence the suspensions response when encountering hard bumps, such as curbs on the racetrack.

Attention! Do not turn the adjusting spindle by force when you reach the end of the adjustment range, this may damage the fine valve inside the system!



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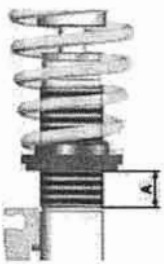
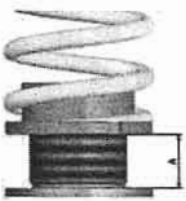
Technical data	Coilover part number ... 71 002			
Vehicle model	Porsche 911 Carrera 2 Type 996		max. permissible front axle load: 825 kg	
	front axle		rear axle	
Spring signature	KW 7101		KW 20-60-80 / KW 90-170*	
Coilover strut / Shock absorber signature	710 1001		710 1102	
Approximate adjustment range* A in mm	min:	max:	min:	max:
	50 mm / 2 inch	70 mm / 2,8 inch	30 mm / 1,2 inch	50 mm / 2 inch
Approximate wheel hub center to fender edge measurement** B in mm	min:	max:	min:	max:
	325 mm / 12,8 inch	345 mm / 13,6 inch	335 mm / 13,2 inch	355 mm / 14 inch

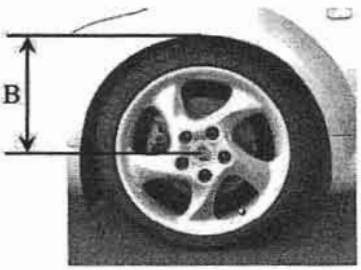
Calculating the adjustment range: (Photos are examples only)



Remaining thread measurement of Strut A



Remaining thread measurement A



Measurement B
Wheel hub center wheel arch

Please enter the adjusted height of the modified car into the list:

Coilover part no	Vehicle type	Measurement A		Wheel hub center to wheel arch Measurement B	
		Front	Rear	Front	Rear

* The remaining thread measurement is approximate and is only intended as a general guide. Actual results may vary due to various axle weights.

** **IMPORTANT:** The allowable measurement between wheel hub center and fender edge as indicated above, may not exceed this measurement when using standard fenders.

KW automotive

Adjusting rebound:
The rebound adjustment is positioned in most cases at the end of the piston rod (top of strut). Please use the supplied KW adjustment wheel on the extruded tab adjuster for all adjustments. Some applications, such as Audi A4 8E, need to be adjusted by using a 2mm allen key.

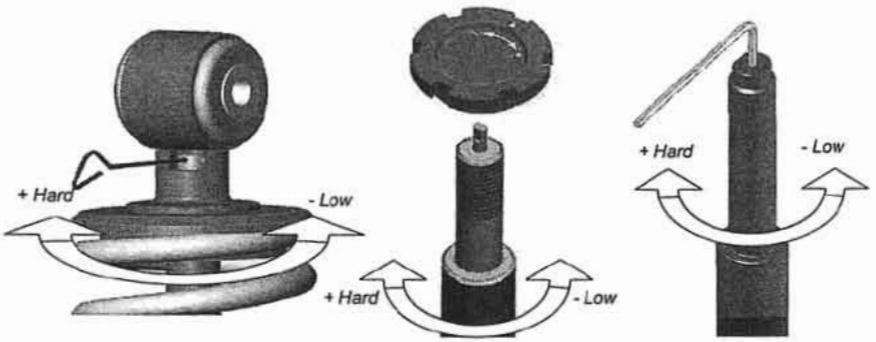
1st step: Place the KW adjuster or 2mm allen key on the adjustment tab/allen bolt.

2nd step: Turn the adjuster clockwise until it stops. This is now adjusted to full hard. (clockwise=harder).

3rd step: Turn the KW adjuster or 2mm allen key counter clockwise to soften the rebound setting to the desired level. The effective adjustment range is from 0 - 3 turns / 0 - 18 clicks open.

Attention:
Never drive the vehicle with the shock absorbers set to full hard or full soft!
Never apply force to the adjusting mechanism of the shock absorber. As soon as you reach the end of the adjustment range, you will recognize a certain resistance. Stop turning to avoid damage to the bottom valve.

Rebound Adjusting principles:
In general a soft rebound adjustment provides a comfortable ride at low vehicle speeds but the vehicle will have less stability at higher speeds, especially on the front axle (vehicle will tend to float at higher speeds). A hard rebound adjustment offers more stability but could reduce vehicle grip (i.e. the vehicle will tend to skip across road imperfections, reducing traction).



Our recommendation for your car to start with:

Front axle	Bump:	1,00	Turns open	Rebound:	1,25	Turns open
Rear axle	Bump:	0,50	Turns open	Rebound:	1,25	Turns open

Or Shock absorber with new clicking system:

Front axle	Bump:	1,00	Turns open	Rebound:	8	Clicks open
Rear axle	Bump:	0,50	Turns open	Rebound:	8	Clicks open

Danger:

1. Always follow the latest accident prevention regulations (not applicable for North America) for each step to prevent any serious bodily harm or injury.
2. We recommend the use of a vehicle hoist or lift when installing the suspension. If a lift is not available and jacking equipment is used, make sure that the vehicle is secured with commercial wheel blocks and jack stand to ensure safety.
3. The suspension components may only be installed by trained technical personnel using the proper tools.
4. The General Installation instructions, as well as the Technical Inspectorate (German TÜV) documents must be read BEFORE attempting installation.
5. Never use impact wrenches or guns to install or remove shock absorber piston hardware.
6. Never disassemble or cut open shock absorbers and/or shock absorber inserts. They contain oil under pressure. Danger of explosion.
7. Before driving on public highways, carry out the work steps on page 7, items 11 through 14 after installation.
8. The suspension regulation (when available) needs to be disabled through an authorized dealer.
9. Please take care in any case that fittings (for example fittings of shock absorber housings or fittings of the lower control arm in the housing of the wheel bearing) are free of dust and oil. (see manufacturer guideline)

General Instructions for Use:

1. When adjusting the vehicle height, make sure that the threads are clean and free of debris. After initial cleaning, move the perch by 10 mm (0.4 Inches) downwards, and then clean the area that you desire to adjust the perch (up or down).
2. During height adjustments on separate shock and spring systems, remove the perch from the vehicle to adjust the height.
3. After adjusting the vehicle height, repeat steps 11 through 14 from page 7.
4. In the area of the piston rod and the sealing package of the new and used damper might be oil and grease collected. This could either be caused by using a special black grease during assembling the washer or due to accumulation of streak oil. Further more oil is used during assembling the cartridge and rod guide. There is no reason of worrying about and damage, as in this area also dust and dirt used to be collected.

General Mounting Specifications:

1. We recommend the use of a vehicle hoist or lift when installing the suspension.
2. **Caution:** If the vehicle is equipped with ride height sensors, they should be removed before removal of struts or dampers, otherwise damage may occur.
3. The struts should be removed as specified by manufacturer's instructions.
4. Manufacturer recommended tools for removal of the original struts, or a suitable spring compressor, must be used in order to remove most factory mounted suspension systems.
5. Mount the complete suspension system as described on the following pages.
6. Never use impact drivers to install nuts on the piston rods as permanent damage may occur. It is imperative that you do not damage the piston rod surface, through use of pliers etc, as the smallest damage will result in seal damage, and will not be covered under warranty.
7. Stay within the lowering range specified in the table on page 3.
   Example: With a specified range of 20-60 mm (0.8—2.3 Inches), 40 mm (1.5 Inches) is your height adjustment range.
8. Ensure that the set screw on each spring collar is tightened to prevent movement of the spring perch. On vehicles with separate shock/spring combinations, no set screw is necessary.

   Caution: Do not over tighten the set screw. Maximum torque is 1-2 Nm (0.74-1.47 ft-lb).
9. Install the suspension components in the vehicle as specified by the vehicle manufacturers in their document.
10. Except as noted, all torque values must comply with manufacturer recommended specifications.
11. After assembly and installation is complete, the vehicle should be rolled onto level ground. Once on level ground, measure the vehicle height and adjust to the customer's requirements, within the prescribed lowering range.

    Caution: Wheel hub center—wheel arch maximum measurement in the table of page 3 must not be exceeded! Also take into account minimum road clearances specified in the table on page 7 (only valid for Germany!).

    Caution: It is common for the vehicle suspensions to settle by an additional 5—10 mm (0.2—0.4 Inches)
12. Examine the clearance between the tires and the suspension over the full range of motion of the wheel. The minimum clearance between the suspension and the tire is 5 mm (0.2 Inches). If this clearance is less than 5 mm (0.2 Inches), wheel spacers may be necessary. With strut designs that are located close to the wheel, but that have no steering functions, use 100 mm (3.9 Inches) spacers on diagonally opposed wheel (e.g. front right, rear left). In this position, you must be able to achieve the minimum clearance required. You can also check the clearance between tire and body.

    Caution: With torsion beam trailing arm axles, this method is not sufficient. The wheel must be under full load as well as test driven to properly calculate the clearances of 5 mm (0.2 Inches) from any other components.
13. The geometry of the suspension needs to be adjusted according the regulations of the vehicle manufacturer. If a value cannot be reached due to the difference in the height, a optimal value next to the tolerance range of the vehicle manufacturer needs to be adjusted.
14. All components that are controlled by vehicle ride height (e.g. headlights, brake bias regulator etc.) must be adjusted as specified by the vehicle manufacturer instructions and procedures.
15. For vehicles with ESP, DSC or EPC your new suspension components may cause an engine fault code to appear. This is only temporary as the vehicle electronics adjust to the new components/height. On some models this will end after driving approximately 3-5 miles, or through turning the steering wheel from full left to full right. On other models, this must be reset through the factory diagnostic port by a qualified technician.

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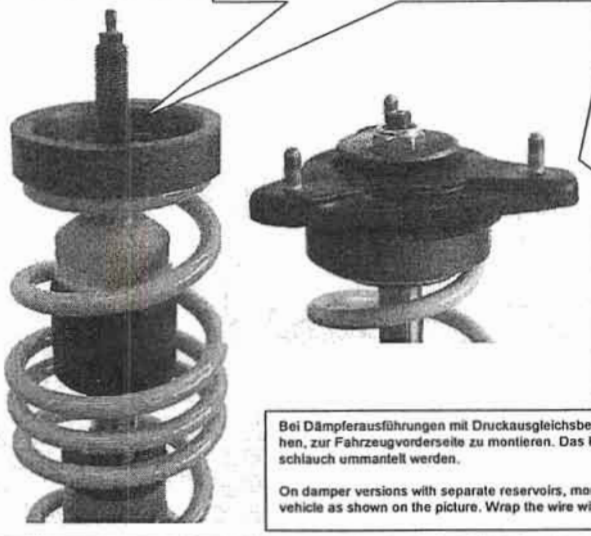
Vorderachse/ Front axle:

Angeliefertes Federbein mit aufgesteckten Stützscheiben.

Supplied coilover strut with installed supporting washers.



Originalstützlager aufstecken und mit der mitgelieferten Stoppmutter verschrauben. Auf der Oberseite des Stützlagers wird die Originalstützscheibe verwendet, auf der Unterseite die mitgelieferte. Das Anzugsdrehmoment der Kolbenstangenbefestigung beträgt 60 Nm. Die Montagehinweise zum Einbau des Federbeines in das Fahrzeug entnehmen Sie bitte den Unterlagen des Fahrzeugherstellers.

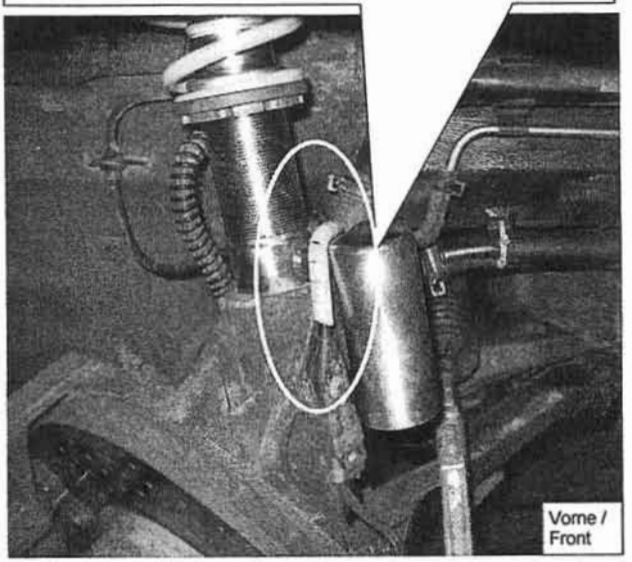
Insert original supporting bearing and mount it with the supplied stop nut. On the upper side of the supporting bearing install the standard supporting washer and at the lower side the supplied supporting washer.
Tightening torque for the piston rod is 60 Nm (44 ft-lb). Please install the strut unit to manufacturers recommended settings regarding tightening torque and fixing specifications.

Bei Dämpferausführungen mit Druckausgleichsbehälter ist dieser, wie auf dem Bild zu sehen, zur Fahrzeugvorderseite zu montieren. Das Kabel muss mit dem mitgelieferten Kabelschlauch ummantelt werden.

On damper versions with separate reservoirs, mount the reservoir facing the front of the vehicle as shown on the picture. Wrap the wire with the supplied cabel conduit.

Nach erfolgtem Einbau des Fahrwerkes, ist die Freigängigkeit der Bereifung zum VA-Federbein zu überprüfen. Das Mindestabstandsmaß an der engsten Stelle darf **5 mm** nicht unterschreiten und ist gegebenenfalls mittels handelsüblicher, TÜV geprüfter Distanzscheiben wieder herzustellen.

After you have completed installation of the suspension, check the clearance of the tyres to the front suspension strut. The minimum clearance at the narrowest point is 5 mm and must, where necessary, be provided using commercially available, Technical Inspectorate (German TUEV) approved spacers.



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Hinterachse/ Rear axle:

Angeliefertes Federbein mit aufgesteckter Stützscheibe.

Supplied collover strut with installed supporting washer.

Originalstützlager auf das Federbein aufstecken und mit der mitgelieferten Mutter verschrauben. Auf der Oberseite des Stützlagers wird die Originalstützscheibe verwendet, auf der Unterseite die mitgelieferte. Das Anzugsdrehmoment der Kolbenstangenbefestigung beträgt 60 Nm. Die Montagehinweise zum Einbau des Federbeines in das Fahrzeug entnehmen Sie bitte den Unterlagen des Fahrzeugherstellers.

Put the standard supporting bearing on the collover strut an fix it with the supplied nut. On the upper side of the supporting bearing install the standard supporting washer and at the lower side the supplied supporting washer. Tightening torque for the pisten rod is 60 Nm (44 ft-lb). Please install the strut unit to manufacturers recommended settings regarding tightening torque and fixing specifications.

Bestätigung

Bestätigung	: Technische Unbedenklichkeit bezüglich der Verwendung konstruktiv unterschiedlicher Federteller für höhenverstellbare Fahrwerke
Auftraggeber	: KW automotive GmbH, D-74427 Fichtenberg

Technische Daten der alternativ verwendbaren Federteller (Maßangaben in mm)

Maße	Federteller / Sicherungsring 650 30 036 / 650 30 035	Federteller 650 30 054	Federteller 652 43 226
Durchmesser, max.	80 / 80	80	82
Durchmesser, min.	52 / 52	52	52,5
Durchmesser, Federauflage	61 / ---	61	61
Höhe	13,5 / 6,5	17,5	22,5 ww. 24
Werkstoff	Aluminium	Aluminium	Kunststoff

Konformität der Maßhaltigkeit : Hinsichtlich der Tieferlegungsmaße am Fahrzeug werden mit den drei aufgeführten Federtellern die im Toleranzenkatalog zu § 30 StVZO „Beschaffenheit der Fahrzeuge" zulässigen Abweichungen eingehalten.

Festigkeitsprüfungen : Die Festigkeit der Federteller wurde durch Laborberichte und Fahrversuche nachgewiesen.

Bestätigung der altern. Verwendbarkeit : Die alternative Verwendung eines der drei oben genannten Federteller, anstelle des im Teilegutachten beschriebenen Federtellers, ist technisch unbedenklich.

Hinweis für die Abnahme nach § 19 Abs. 3 : Es sprechen keine Bedenken gegen die Verwendung der Bestätigung als ergänzende technische Information zum genannten Teilegutachten bei der Abnahme nach § 19 Abs. 3 StVZO.

Hannover, Datum des Teilegutachtens
IFM/925/Bb

IFM TÜV NORD DIN EN ISO/IEC 17025 KBA-P00004-96

Barbknecht

Obering. Dipl.-Ing. Barbknecht
Amtlich anerkannter Sachverständiger

E-Mail KBarbknecht@tuev-nord.de
Telefon +49 (0)511 986-1595
Fax +49 (0)511 986-1998