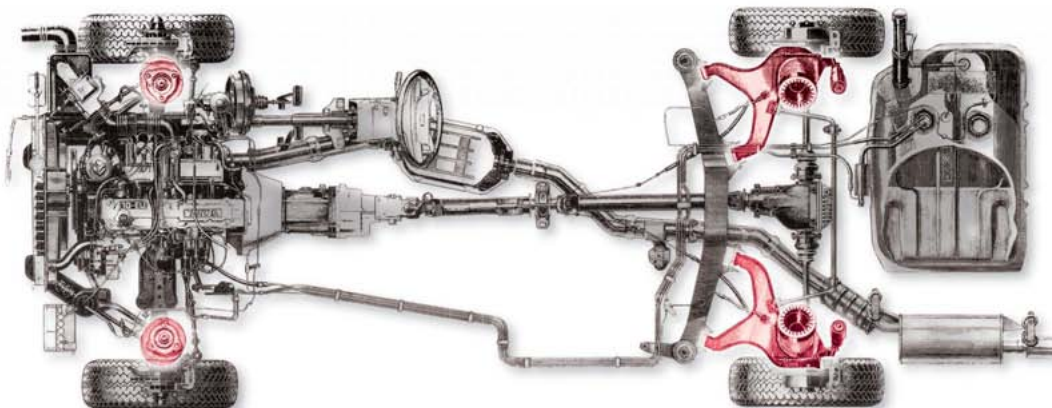


# Suspension System Mechanism



MECHANISM 1

## The suspension

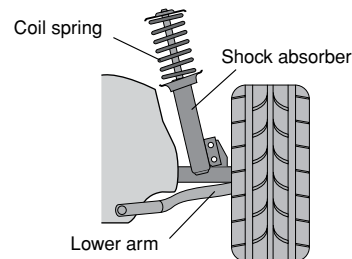
Suspension is designed to dissipate the load forced onto a vehicle by absorbing vibration and impact from the road, stabilizing the position of the car while driving, and sustaining the optimum balance of the car for comfortable driving. The suspension is constructed using a combination of spring or shock absorber that absorbs vibration/impact and a stabilizer that reduces horizontal movement (roll).

MECHANISM 2

## Types of suspension

### Strut type suspension

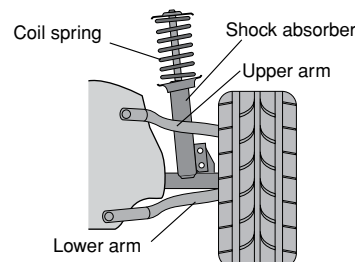
The lower part of the suspension system uses the lower arm attached to the chassis to receive the drive shaft where as the upper part is placed on the extension of the king pin, connected to the body with the coil spring attached to the shock absorber. The system allows for a lower number of component parts, providing increased space as a merit, however, is less effective during larger rolls while cornering.



Strut type suspension

### Double wishbone type suspension

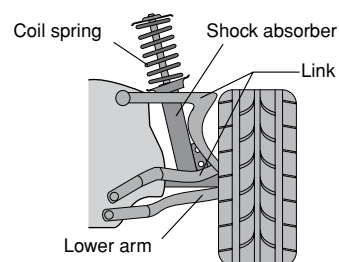
The double wishbone type suspension system has independent moving right hand and left hand parts. The independent hanging type is most common. The two upper and lower suspension arms support the combined shock absorber and coil spring. The wishbone name likens the shape of the arm to the chest bone of birds. The system provides high rigidity, better stability and handling but due to the complex structure, the system occupies space.



Double wishbone type

### Multi-link suspension

The term multi-link is coined as the system is structured by dividing the lower arm into multiple links. The high control ability born of the multiple link system allows the vehicle to sustain the vehicle in an optimum balanced condition during roll, braking, and acceleration. Recently, the system has been used in many luxury vehicles.



Multi-link type

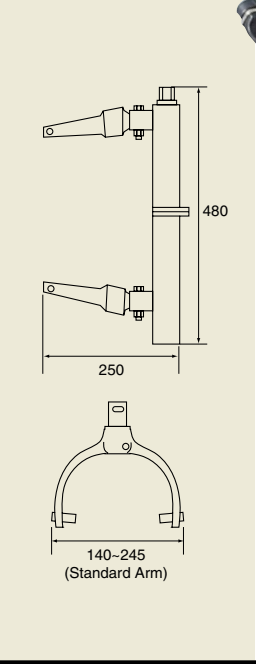
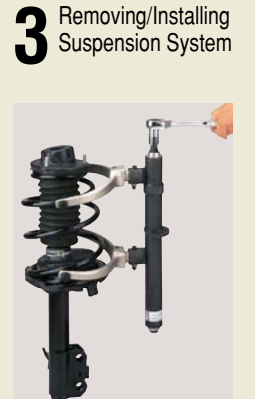
# SUSPENSION Disassembling/Assembling Suspension System

**1** Removing/Installing Wheel Cap  
 ① Remove Wheel Cap  
 ② Remove/Installing Wheel Nuts

- WHEEL CAP WRENCH
- CENTER CAP WRENCH FOR ALUMINUM WHEEL
- OTHER TOOLS
- IMPACT WRENCH
- WHEEL NUT SOCKET FOR IMPACT WRENCH
- CROSS RIM WRENCH
- OTHER TOOLS

**2** Pinching off Brake Hose  
 ① Block off of Hoses  
 ② Disassembling Pipe

- PINCH OFF PLIER
- FLARE NUT WRENCH
- OTHER TOOLS



**STRUT SPRING COMPRESSOR**

No. AS10	kg 6.0	1
Body	AS10-1	
Standard Arm (Dia.90~170)	AS10-2	

**Applicable Coil Spring**

Article	Applicable Capacity
Wire Dia.	18mm or smaller
Outer Dia.	Standard Am... 90~170mm Large Am.....135~220mm
Coiling Cycle	2 times or more
Coil Span	20mm or over

- Purpose**
- For removing/installing coil springs used in automotive suspensions.
  - Wide application for use on front-& rear-suspension of FWD(FF Cars) and RWD(FR Cars), strut type coil springs, etc.

- Special feature**
- If excessive load is applied on spring compressor, breaking mechanism will work inside the drive of center screw bolts. (Breaking load: 1,300kgs.) (Fig.2)
  - Built in center screw bolts for protecting screw part.
  - Compact pipe style body for easy operation.

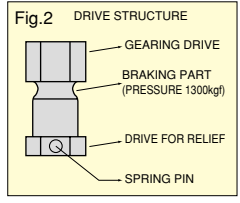
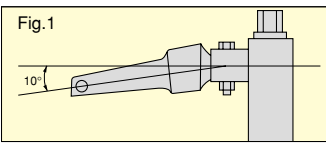
**Body**

No.	Dimension	kg
AS10-1	Length 480× φ42	3.8

**Arm**

No.	Applicable Diameter	kg	1
AS10-2	Standard Am Dia. 90~170	2.2	1
AS10-3	Large Am Dia. 135~220	2.5	1

- WARNING**
- BEFORE USING THIS TOOL, CAREFULLY READ THE PROVIDED INSTRUCTIONS.
  - NEVER APPLY OVER TORQUE ALTHOUGH BRAKE MECHANISM WORKS AT THAT TIME.
  - NEVER USE THIS TOOL WITH IMPACT WRENCH.
  - THIS TOOL IS SUITABLE FOR USING ON JAPANESE CARS.



## Cautionary points on handling the spring compressor

As a result of the investigations carried out based on consumer comments and questions concerning the usage of the previous spring compressor SPU-70315 (1987~1995) provided by our company, the following daily uses were occurring. It is requested that the User's manual and cautionary points along with the maintenance procedures of this product are read thoroughly before use.

If any faults are recognized under the inspection items within the inspection guidelines, stop using this product and replace with the spring compressor (product number: AS10) currently provided by our company.

### Explaining the situation

- Recent strut type springs have high spring numbers or illegally modified springs projecting a high stress load. Attachment and removal of springs that exceed the previous safety standards is being conducted.
- The tool is used when the span of the upper and lower arm (that hooks the spring during spring attachment and removal) is short. The spring characteristic allows for the compression that presses the spring to be different even when compressing the same amount.  
Ex.) Standard number of springs (Load necessary in order to compress the spring by 1mm)  
 2 springs wound 363N/mm  
 3 springs wound 180N/mm  
 The compression load can double depending on the condition in which the spring is hooked (wound).
- The spring is sometimes compressed using prohibited power tools (impact wrench) instead of the hand tool. Using a power tool to compress the spring is dangerous due to the immediate change in tightening strength, which can lead to compression exceeding the permissible range of the product.

The content explained above relates to an extremely dangerous operation on using the tools. Check the following inspection guidelines when using this tool.

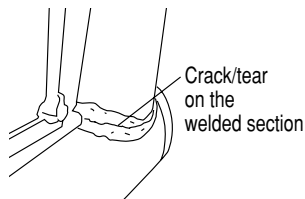
\*Please check the merchandise inventory for a product that is marked by before placing an order.

**Inspection guidelines**

● Inspection spots and inspection methods (do not use if the following inspection items are faulty)

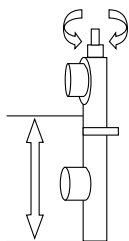
**① Welded spot on the attachment section of the fixed arm**

- Thoroughly clean the welded section using brake cleaners, etc. and visually check for any torn, cracked weld sections. (Cracked or torn sections are faulty)



**② Inspecting the center screw bolt**

- From the slide groove on the main unit moving arm, visually inspect for unusual wear or bends on the center screw bolt.

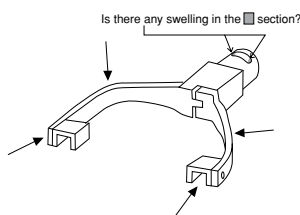


**③ Moving arm friction inspection**

- Turn the head-drive with your hands and check that the moving arm moves smoothly. (When rotation is uneven, the center screw bolt is worn or damaged.)

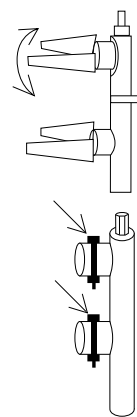
**④ Individual inspection for the fixed and moving arm**

- Remove both arms from the body and inspect for bends and wear.
- Inspect for any deformities on the hole for passing through the attachment bolt.
- Check that the arm can be removed easily.



**⑤ Moving and fixed arm sway inspection**

- After properly attaching the fixed and moving arm to the main unit, check that the neck sways smoothly without unevenness. (If uneven, item (4) is swelled or the attachment section is deformed.)



**⑥ Fixed and moving arm attachment bolt**

- Remove the fixed and moving arm attachment bolt from the main unit and visually check for bends, wear, and damage on the screw section.

If any faults are found in the above inspection, the parts have exceeded their useful life. Continuing to use these parts can cause damage and is dangerous. Avoid use. The listed contents can be used for the inspection for AS10. Please perform these inspections.

**Cautionary points on use**

• Never use an impact wrench as this can cause the spring compressor to break.

**[Pre-use inspection]**

- Perform the following inspections before operation and check for any faults. (Do not use if there are any faults)

- ① Check that the attachment bolts and nuts on Arm 1 and Arm 2 are not loose.
- ② Arm 1 and Arm 2 necks should sway freely.
- ③ Turn the center screw bolt with your hands and check that Arm 2 moves smoothly along its full stroke.
- ④ The hook moves swiftly left and right.
- ⑤ There are no signs of cracking, deformity, or damage.

**[Attaching the spring]**

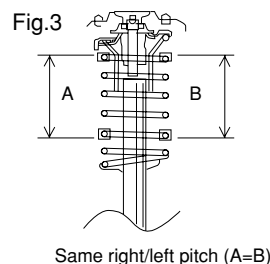
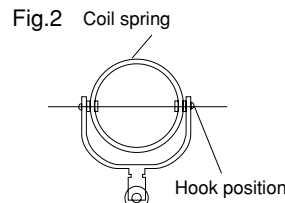
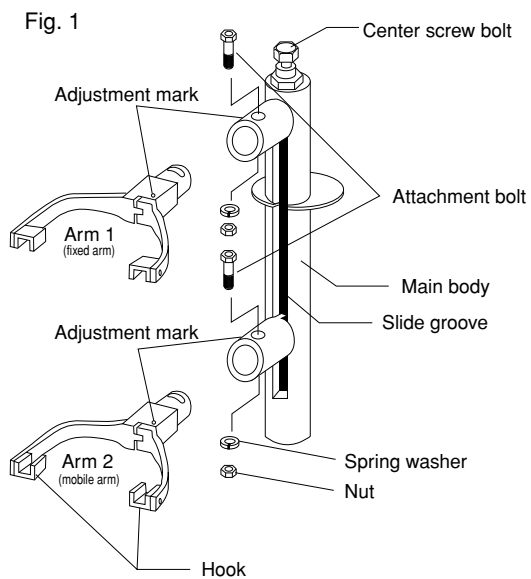
- ① Attach to the diameter section of the spring when attaching the hook to the spring. (Fig. 2)
- ② Set to the widest position when considering the span of the hook for the upper and lower arms. (Distance between diagram 3A and B)
- ③ The spring pitch number (wind number) for the wind between the left and right hooks for the upper and lower arm must be equal. (Fig. 3)

**[In use]**

- When the tightening force suddenly increases during compression, immediately stop operation and loosen the spring.
- Do not compress until the line spaces between the springs are filled.
- Take care as to avoid having the upper and lower arm attachment bolts touch when using springs with low pitch numbers (fewer winds).
- Many springs with low pitch numbers have a high load. Use a torque wrench to control the torque of the tightening drive when using. (Tightening drive torque should be below 44N-m)

**[Maintenance]**

- Amply support the screw section of the center screw bolt and apply lubricant before use.
- When storing, make sure foreign particles/dust, etc. do not enter the slide groove section of the main unit.
- Do not disassemble or modify this product.



**4** Inspecting Torque

● **TORQUE WRENCHES**



➔ P.157

**5** Installing Wheel and Inspecting Torque

● **IMPACT WRENCH**



➔ P.166

● **WHEEL NUT SOCKET FOR IMPACT WRENCH**



➔ P.218

● **CROSS RIM WRENCH**



➔ P.119

● **WHEELNUT TORQUE WRENCH**



➔ P.219