

# Measuring for Shock Absorbers

## Instructions



Flex Ramp

**CAUTION:** Safety glasses should be worn at all times when working with vehicles and related tools and equipment.



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### Suggested Tools:

- Fork Lift (or Flex Ramp)
- Measuring Tape
- Safety Stand

## Background Information:



Basic Shock Absorbers do not have any load carrying capability. The weight of the vehicle and its cargo is carried or supported by the springs. Shock absorbers, or “shocks” as they are sometimes called, are more accurately called dampeners because in reality they dampen spring occupations. They dampen in a compressing mode when the wheel encounters a bump in the road and dampen in the extension mode when the wheel encounters a hole in the road.

The job of selecting the correct shock absorber for your vehicle is quite simple when your vehicle is completely stock or unmodified. You simply order new shock absorbers according to year, make, model, engine size and in some cases, one or two other specifications. But, If your vehicle has been modified, selecting the right shock for your vehicle becomes a bit more technical.

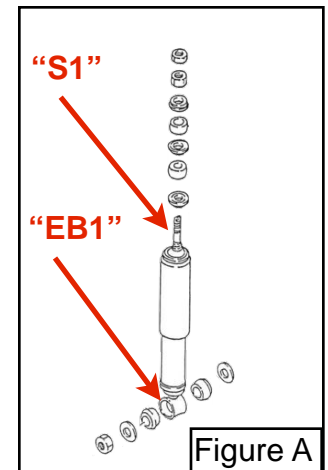
These instructions have been created to make this process easier for you, the customer and for us, the supplier.

To begin this process we need to establish a few terms and definitions:

**Shock Mounting Methods:** How the shock is attached to the vehicle, at the top and bottom.

**Stem** (or Stud) Mount - The symbol used is “**S1**”. This type of mount is where the shock has a vertical stud which mounts in a hole. (See Figure A)

**Eye Bolt** - The symbol used is “**EB1**”. This type mount is where the shock is mounted to a horizontal bolt or stud. (See Figure A)

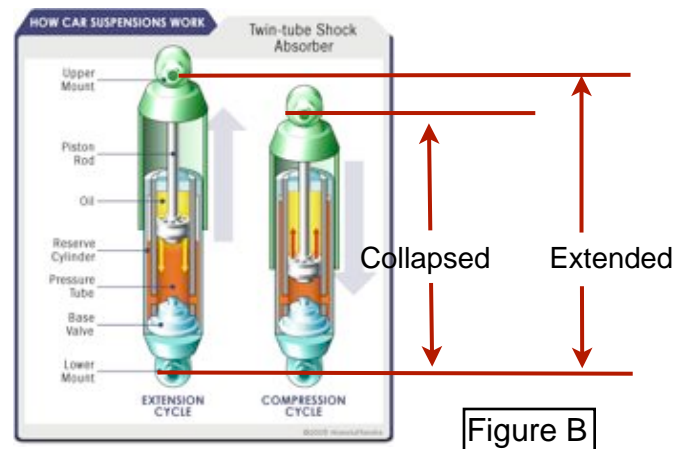


**Shock Length:** This is how long the shock is when fully extended and fully collapsed (or compressed).

Extended length - See Figure B

Collapsed length - See Figure B

**Hardware Kits:** These are the bushings, washers, sleeves and nuts that are needed to attach the shock to the vehicle. These kits vary in contents according to application. (See Example Below)



## Measuring To Determine The FRONT Shock Size



### Step 1

All measurements are to be taken from the center of the shock mount bolt at the top . . . .

### Step 2

. . . and the center of the shock mount bolt (or stud) at the bottom.

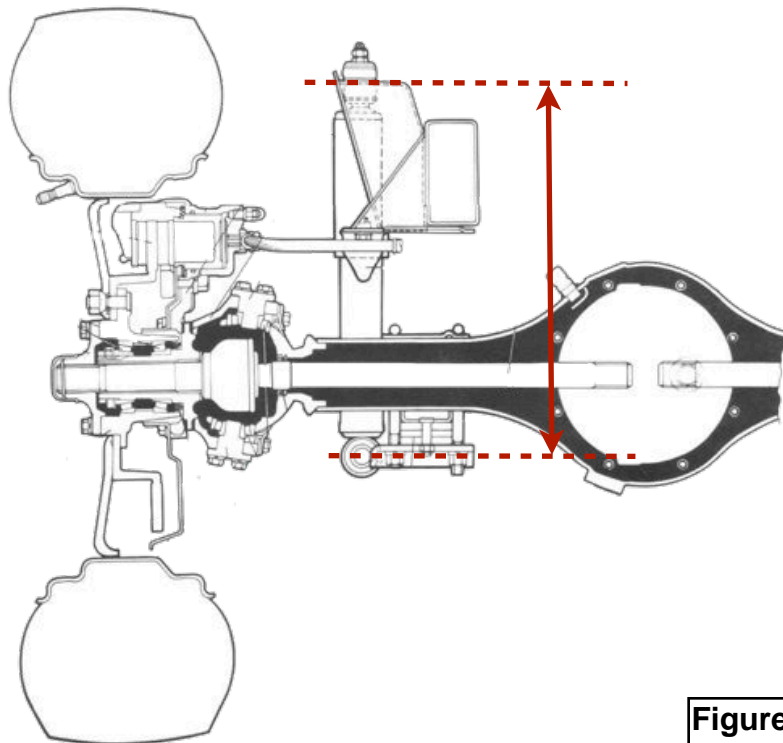


Figure C

### Tech Tip

If the upper shock mount was an OEM (Original Equipment Manufactured) mount, it would be a stem or (stud) mount which would be measured like the one shown in **Figure C**.



## Measuring To Determine The REAR Shock Size

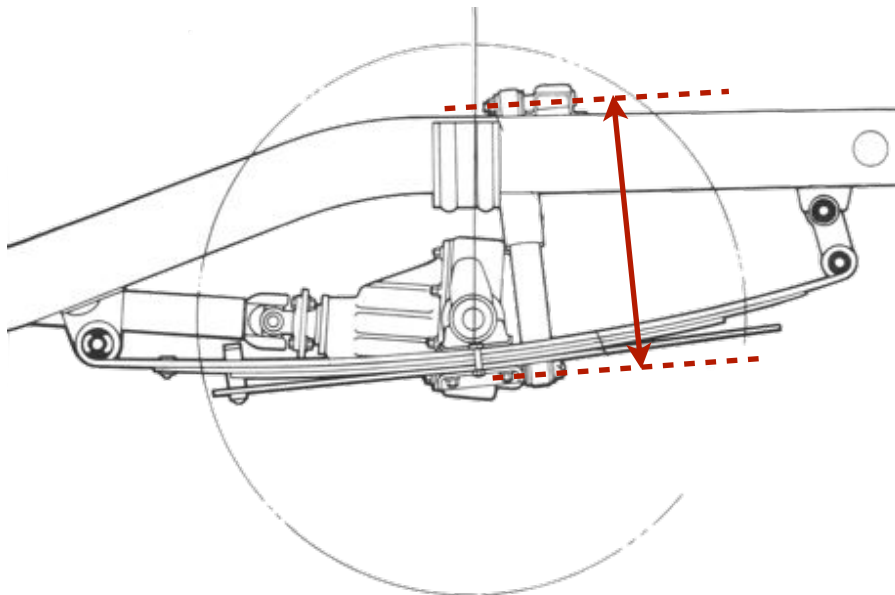


### Step 3

All measurements are to be taken from the center of the shock mount bolt at the top . . . .

### Step 4

. . . and the center of the stud mount bolt at the bottom. See **Figure D**.



**Figure D**

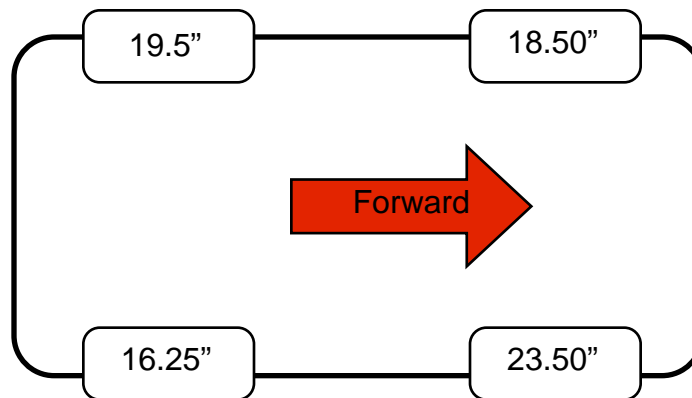
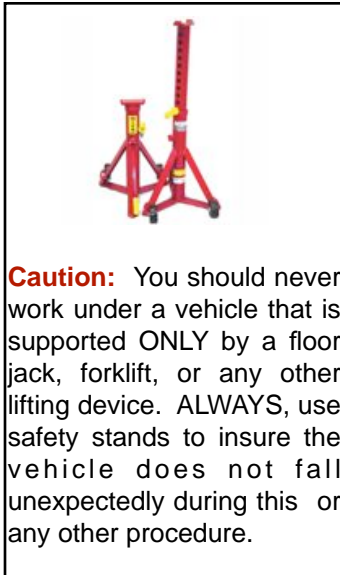


**NOTICE:** These instructions will work for any vehicle. We chose to use a 1987 Suzuki Samurai as our example.



## Step 5

Using a fork lift or flex ramp; lift the Right Rear wheel until another wheel (either Right Front or Left Rear) leaves the ground. Place a safety stand under the vehicle in case the lifting device fails. Measure all 4 shock absorber lengths and record the measurements. See **Figure E**

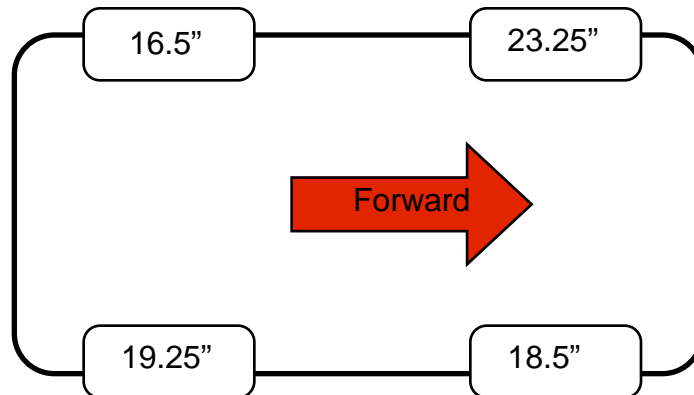


**Figure E**



## Step 6

Lift the Left Front Wheel until another wheel (either Left Front or Right Rear) leaves the ground. Measure all 4 shock absorber lengths and record the measurements. See **Figure F**.



**Figure F**

## Step 7

Now that you have all 8 measurements, lets analyze the results. Lets look at the rear measurements first. The rule is: **The new shocks should collapse less than the smallest measurement and extend more than the longest measurement.** This means the new shock absorbers, once installed, should never compress all the way and should never extend all the way. Another way of looking at it is; the shock absorbers should not limit wheel travel in any way, at any time.

### Rear Results

Smallest Measurement 16.25"  
Largest Measurement 19.50"

This means the REAR shock absorber should be able to collapse to a measurement less than 16.25" and extend to a measurement greater than 19.50". To make things easier lets round these numbers:

**16" Collapse Length**  
**20" Extended Length**

This means our rear shock should collapse less than 16" and extend greater than 20". If you have to compromise either measurement, it is better to increase the extended length.

## Step 8

Now lets look at our front measurements.

### Front Results

Smallest Measurement 18.50"  
Largest Measurement 23.50"

This means the FRONT shock absorber should be able to collapse to a measurement less than 18.50" and extend to a measurement greater than 23.50". To make things easier lets round these numbers as well.

**18" Collapse Length**  
**24" Extended Length**

This means our front shock should collapse less than 18" and extend greater than 24". If you have to compromise either measurement it is better to increase the extended length.

Note: In our example both shocks (Front and Rear) require a mounting method of Eye Bolt "EB1" on both ends.



# Selecting the Shock



## Rear Shock Rounded Measurements:

- Less than 16" Collapse Length
- Greater than 20" Extended Length

## Front Shock Rounded Measurements:

- Less than 18" Collapse Length
- Greater than 24" Extended Length

### HARDWARE KITS

- |                                  |                                  |
|----------------------------------|----------------------------------|
| KIT#1→ 1 1/2" SLEEVE (#1)        | KIT#6→ 1 12mm x 2.095            |
| 1 12mm SLEEVE (#4)               | 1 NARROW SLEEVE (T)              |
| KIT#2→ 1 10mm SLEEVE (#6)        | KIT#8→ 1 3/4" I.D. BUSHING (#3)  |
| 1 9/16" SLEEVE (#9)              | 1 16mm I.D. SLEEVE (Q)           |
| 1 1/2x2.235 ext SLEEVE (C-2)     |                                  |
| 1 3" CROSSPIN (#7)               | KIT#9→ 1 5/8" CHEVROLET          |
| KIT#3→ 1 3/4" I.D. BUSHINGS (#3) | 1 OE MOUNT BOLT (P-19)           |
|                                  | KIT C-1→ 1 2.50" ext. LATE CHEVY |
| KIT#5→ 1 2.50" CROSSPIN (#5)     | KIT#1→ 1 UPPER MOUNT             |

NOTE: Numbers in ( ) refer to individual piece PT.#s

DT3000	8000 Pre-Runner	9000 Nitrogen	Extended Length	Collapsed Length	Mount. Code Upper	Mount. Code Lower	Hardware Kits Included
-	-	M-9035	13.50	9.00	S1	EB1	1
-	-	M-9039	13.50	9.00	S1	EB1	1,5
-	-	M-9044	13.50	9.00	S1	EB1	1,6
S-3035	S-8035	S-9035	13.50	9.00	S1	EB1	1
S-3039	S-8039	S-9039	13.50	9.00	S1	EB1	1,5
S-3044	-	-	13.50	9.00	S1	EB1	1,6
S-3809	-	-	13.50	9.00	EB1	EB1	1,9
S-3078	S-8078	S-9078	14.50	9.50	S1	EB1	1,5
S-3087	S-8087	S-9087	14.50	9.50	S1	EB1	1,6
S-3803	-	-	14.50	9.50	EB1	EB1	1,9
3052	8052	9052	15.50	10.00	EB1	EB1	1,9
3069	8069	9069	15.50	10.00	S1	EB1	1
3073	8073	9073	15.50	10.00	S1	EB1	1,5
3075	8075	9075	15.50	10.00	S1	EB1	1,2
3434	8434	9434	15.50	10.00	S1	EB1	1,8
3900	8900	9900	17.50	11.50	EB1	EB1	1,C1
3906	8906	9906	17.50	11.50	EB1	EB1	1
3923	8923	9923	17.50	11.50	S1	EB1	1
3095	8095	9095	18.50	11.50	EB1	EB1	1,9
3112	8112	9112	18.50	11.50	S1	EB1	1
3122	8122	9122	18.50	11.50	S1	EB1	1,8
3129	8129	9129	19.50	12.50	EB1	EB1	1,2
3135	8135	9135	19.50	12.50	EB1	S1	1
3146	8146	9146	19.50	12.50	S1	EB1	1
3155	8155	9155	19.50	12.50	S1	EB1	1,6
3856	8856	9856	19.50	12.50	S1	S1	-
3163	8163	9163	21.50	13.00	EB1	EB1	1,2
3166	8166	9166	21.50	13.00	EB1	EB1	1,2,3
3180	8180	9180	21.50	13.00	S1	EB1	1
3182	8182	9182	21.50	13.00	S1	EB1	1,8
3184	8184	9184	21.50	13.00	S1	EB1	1,5
3189	8189	9189	21.50	13.00	S1	EB1	1,6
3259	8259	9259	21.50	12.00	S1	S1	-
3231	8231	9231	22.50	13.50	EB1	EB1	1,2
3234	8234	9234	22.50	13.50	EB1	EB1	1,2,3
3248	8248	9248	22.50	13.50	S1	EB1	1
3250	8250	9250	22.50	13.50	S1	EB1	1,8
3252	8252	9252	22.50	13.50	S1	EB1	1,5
3257	8257	9257	22.50	13.50	S1	EB1	1,6
3265	8265	9265	24.50	14.50	EB1	EB1	1,2,9
3268	8268	9268	24.50	14.50	EB1	EB1	1,2,3
3277	8277	-	24.50	14.50	EB1	EB1	1,3
3282	8282	-	24.50	14.50	S1	EB1	1
3293	8293	-	23.50	13.50	S1	S1	-
3333	8333	-	26.50	15.50	EB1	EB1	1,2
3336	8336	-	26.50	15.50	EB1	EB1	1,2,3
3350	8350	-	26.50	15.50	S1	EB1	1
3352	8352	-	26.50	15.50	S1	EB1	1,8
3361	8361	-	25.50	14.50	S1	S1	-
3368	8368	-	29.50	17.00	EB1	EB1	1,2
3371	8371	-	29.50	17.00	EB1	EB1	1,2,3
3386	8386	-	29.50	17.00	S1	EB1	1
3385	8385	-	28.50	16.00	S1	S1	-
3403	8403	-	32.00	18.50	EB1	EB1	1,2
3407	8407	-	32.00	18.50	EB1	EB1	1,8
3421	8421	-	32.00	18.50	S1	EB1	1
3420	8420	-	31.00	17.50	S1	S1	-
3600	-	-	36.00	20.50	EB1	EB1	1,2

Extended and Collapsed lengths shown are for DT3000 Series Shocks others maybe slightly different.  
Lowered Truck Shock specifications are listed in Shock App. Guide  
Call for Specs on Shocks not listed on this page.

EB1 = Eye Bolt

S1 = Stem (or Stud)

Figure E

## Step 9

Our rear shock choice is:  
**Pt # 3268 for a 3000 Series**  
**Pt # 8268 for an 8000 Series**

Note: The 3234 or 8234 could have been used here but we like a longer extended length in case we want to add a bit more lift to our vehicle in the future.

## Step 10

Our front shock choice is:  
**Pt # 3336 for a 3000 Series**  
**Pt # 8336 for an 8000 Series**

Note: The 3371 or 8371 could have been used here but we felt that the 17" collapsed length might be a bit too close to our 18" measurement. Especially if you chose the 8000 Series shock with the built-in bump stop.



3000 Series



Bump Stop

8000 Series



### Tech Tip 1

The DT3000 Series is designed for Suzuki and smaller Toyota size vehicles, such as the Tacoma and 4Runner. If you have a full size pickup, such as a Tundra, you may consider the 8000 Series shock absorber. The 8000 Series shock is a little stiffer than the 3000. It also has a built in bump stop. However, the bump stop is not a real advantage because the shock will never completely compress, especially if you select the correct shock according to these instructions.

### Tech Tip 2

Both the 3000 and 8000 Series shock absorbers come equipped to accommodate a 5/8" bolt with the Eye Bolt "EB1" mounting method and the necessary bushings, washers and nuts to accommodate the Stem (or Stud) "S1" mounting method.

### Tech Tip 3

Along with the standard hardware mentioned above the shocks will include additional hardware. The additional hardware that is included is shown in the far right column of **Figure E**. It is labeled "Hardware Kits Included". The contents of these kits are detailed at the top of **Figure E**.

### Valued Customer

We hope these instructions have been helpful. Please call our Tech Support line if you have any questions. The phone number is shown at the bottom of each page.



As always, If you experience any difficulty using these instructions please contact Low Range Off-Road Technical Support at 801-805-6644 M-F 8am-5pm MST. Thank you for purchasing from Low Range Off-Road.



These instructions are designed as a general installation guide. Installation of many Low Range Off-Road products require specialized skills such as metal fabrication, welding and mechanical trouble shooting. If you have any questions or are unsure about how to proceed, please contact our shop at 801-805-6644 or seek help from a competent fabricator. Using fabrication tools such as welders, torches and grinders can cause serious bodily harm and death. Please operate equipment carefully and observe proper safety procedures.

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