



**FR500S**



## **Technical Information and Tuning Guidelines** **ZF Sachs Dampers for Ford Racing FR500S**

### **General Information**

- The ZF Sachs Dampers for the Ford Racing FR500S were developed exclusively for off-highway purposes and are not intended for use on public roads.
- The dampers are factory charged with nitrogen gas. The front struts are charged to 5 bar (73psi) and the rears shocks are charged to 15 bar (216 PSI.). It is important that these pressures are set with the shock fully extended.
- For safety reasons and rules compliance, it is not permitted to open the shock absorbers.
- Each damper has a serial number near the lower attachment point. The serial number is kept on file with the shock damper forces for each unit.
- The shocks will be checked periodically for unauthorized modifications.

### **Service**

The dampers should be inspected and serviced by ZF Sachs after each season of use. They should also be inspected and repaired after any accident damage.

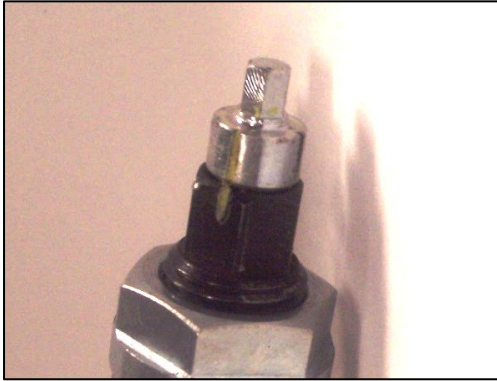
All inspection, servicing, and repair can be performed through ZF Sachs Race Engineering.

Ship-to-address:  
ZF Sachs Race Engineering NA  
Attn: Service Department  
15811 Centennial Drive  
Northville, Michigan 48168

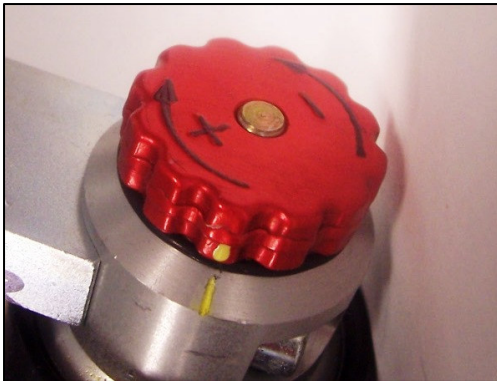
A service form is included at the end of this manual. This **service form should accompany any parts** shipped to ZF Sachs.

## Adjustment Instructions

Dampers are 2-way adjustable, with separate, independent adjustment for the rebound (extension) and bump (compression) forces.



The **rebound adjustment** on the **front strut** is on the top of the piston rod and has a **4mm** hex head. It is accessible from under the hood, and marked in  $\frac{1}{4}$  turn increments



The **compression adjustment** on the **front strut** is a knob on top of the remote reservoir, which is piggybacked to the strut body. It is accessible through the front wheelwell.



The **rebound adjustment** on the **rear shock** is located in the lower shock eye. It is accessible from under the vehicle, and can be adjusted using a small pin to rotate the adjuster; each hole is  $\frac{1}{4}$  turn, and the sweep of the eye (the maximum amount that can be adjusted without repositioning the tool) is also  $\frac{1}{4}$  turn.



The **compression adjuster** on the **rear shock** is a knob on the remote reservoir. It is accessible through the trunk.

### **Rebound Adjustment**

Turning the **rebound adjuster** in the **clockwise direction** (minus) will **soften** the damper forces in extension.

Turning the **rebound adjuster** in the **counter-clockwise direction** (plus) will **stiffen** the extension force.

Note that the rebound adjuster on the rear shock is upside down, and that clockwise/counter-clockwise are referenced by looking upwards from the ground (down the shock rod from the eye side). The eye is marked for reference.

The shock adjustment in rebound has a total of 720 degrees, with the center calibrated factory position being in the 360 degree position plus or minus 15 degrees.

The units are all calibrated and marked with a yellow line on the rod and upper adjustment shaft of the strut. This is called the 0 (zero) position. The recommended adjustment range for tuning is plus or minus 270 degrees.

### **Compression Adjustment**

On the top surface of the adjustment knob, there are arrows pointing for firmer and softer settings.

Turning the **compression adjuster** in the **clockwise direction** (plus) will **stiffen** the damper forces in compression.

Turning the **compression adjuster** in the **counter-clockwise direction** (minus) will **soften** the extension force.



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There are between 45 and 50 clicks (1/8 turn per click) total. There are 2 yellow marks that will line up between 22 and 27 clicks. This is the midpoint and calibration point for the compression settings. This is referred to as the center (20 clicks) position. There should be a minimum of 20 clicks above (plus/clockwise) and 19 clicks below (minus/counter-clockwise) this position. The compression adjustment is referred to as the number of clicks from 1 through 40.

### **Nominal Settings**

It is recommended that you start your tuning from the as-delivered, centered positions. Both front and rear shocks are delivered in the "0/20" position (0 degrees Rebound/20 clicks Compression). Neither of these references refers to the mechanical center points of the adjustment; they refer to the hydraulic force calibration position.

## Basic Shock Tuning Suggestions

	FRONT		REAR	
	Comp	Reb	Comp	Reb
<b>Straightaway Bouncing</b> - all damping levels are generally low. In some cases the adjustments could be too firm if the car is overreacting to small inputs	+	+	+	+
<b>Straight Line Braking - Front Lockup</b>	-			
<b>Straight Line Braking - Rear Lockup</b>	+			-
<b>Trail Braking - Slow turn-in response</b>	+			+
<b>Trail Braking - Understeer</b>	-			+
<b>Trail Braking - Oversteer</b>	+			-
<b>Turn In (no braking) - Understeer</b>		-		+
<b>Turn In (no braking) - Oversteer</b>		+		-
<b>Steady State Turning - Understeer*</b>	-	-	+	+
<b>Steady State Turning - Oversteer*</b>	+	+	-	-
<b>Corner Exit - Understeer</b>		-	+	
<b>Corner Exit - Oversteer</b>		+	-	
<b>Straight Line Acceleration - Lack of traction</b>		-	-	

\* - Once the vehicle is steady-state (no pitch/roll) in a turn, damper movements are no longer influencing the behaviour.

These are basic, general guidelines on how to tune different issues with dampers. There are other items to tune that can also help with your optimal set-up in different areas. Tire Pressures, alignment settings, ride heights and sway bar adjustments can also address some of the same issues. Every track will be a series of compromises in different areas to get the fastest vehicle set-up for the racing conditions, remember weather and the time of day can also be variables.

ZF Sachs Race Engineering NA  
 15811 Centennial Drive  
 Northville, MI. 48168  
 USA  
 Phone: +1 (734) 416-6200  
 Fax: +1 (734) 416-1948  
 E-mail: service.srena@zf.com



# SERVICE ORDER

## Damper systems

**Note: This order form must be attached to the damper in order to execute the service order.**

**We reserve the right to bill a service charge of \$60.00, even if no repair was carried out.**

Please print

Customer's delivery address:		Customer-no.:	
Company name		Order / Delivery note-no.:	
Street		Contact person (ZF SRE):	
City / State / ZIP Code		Date of contact:	
Contact			
Phone-no.	Fax-no.		
E-mail address:			
Vehicle manufacturer and type:	Mileage:	Accident:	<input type="checkbox"/> Yes <input type="checkbox"/> No

Article-no.:	Description:	Type of repair: <input type="checkbox"/> Measurement of performance <input type="checkbox"/> Setting change <input type="checkbox"/> Damage repair <input type="checkbox"/> Rebuild
Reason for repair:		

Requested delivery time: (Notice: approx. leadtime 3 weeks)

If request for service is declined please  send back the damper  scrap the damper

Notice: payment policy for new customers:  advanced payment  credit card

date:

Signature: