Coil-Over Spring Rater
Users Manual

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Introduction

This manual contains specifications and operation instructions for Intercomp's Coil-Over Spring Rater. **Note**: This unit can serve a dual purpose for use as a Coil Spring Tester.

Specifications

Controls

General:	Zero, backlight, On/Off.
Display:	4 digit LCD.
Travel indicator controls:	Zero, in/mm. 10.625 inch total travel

Electrical

Batteries:	1 (9-volt) size disposable alkaline or rechargeable Nickel-Cadmium cell.
Resolution:	24 bit A/D delivers over 16,000,000 internal counts
Auto-Zero:	Automatically zeros off errors of zero-load.
Battery life:	300 hours with an alkaline battery 20 hours with backlight on
Low battery indication:	Flashes 'L.bAt' when battery is running low; Automatically turns off when battery power is low enough to affect reliability.
Travel indicator:	Displays spring compression length to the nearest .001 in or .01 mm.

Performance

Accuracy:	±0.25% of applied load or ± display graduation, whichever is greater.
Capacity:	5000 lb x 1 lb / 2500 Kg x .5 Kg

Environmental

Humidity:	10 to 95% Non-Condensing.
Temperature:	Operating: -10 C to +40 C. / +15 F to +105 F.
	Storage: -40 C to +75 C. / -40 F to +170 F.

Physical

Dimensions:	Base: 10" X 10.8" / 25cm X 27cm
	Height: 54.2" / 138cm
	Weight: 44 lb. / 22 kg

Optional Equipment

Shock Dyno Clevis (.5 in)   Part # 805188
Compressor Adapters   Part # 110062
Shock Mounts (.625 in)   Part # 110070
Pull Bar Mounts (.75 in)   Part # 110071
Pull Bar Rater Kit   Part # 110064

Declaration of Conformity

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We,   Intercomp Company
      3839 County Road 116
      Medina, Minnesota 55340 USA

Declare under sole responsibility that the Coil-Over Spring Rater to which this declaration relates meets the essential health and safety requirements and is in conformity with the relevant EC Directives listed below using the relevant section of the following standards and other normative documents.

2001/95/EC - on general product safety
2004/108/EC - relating to electromagnetic compatibility and replacing Directive 89/336/EEC
EN 55011:2009, Class B - Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN61000-6-1:2007 - Generic standards, Residential, commercial and light industry environment
EN 61000-6-2:2005 - Immunity for industrial environments
EN 61000-6-3:2007 - Emission standard for residential, commercial and light-industrial environments
2006/42/EC - on machinery, and amending Directive 95/16/EC (recast)
2013/56/EU amending Directive 2006/66/EC on batteries and accumulators

This product complies with all safety-relevant provision referring to protection against electrical hazards and other hazards, such as mechanical hazards, fire hazards, noise and vibration. The safety issues of this measurement equipment have been evaluated under the self-certification provisions of the relevant directives.

The related technical construction files are held for inspection in the U.K. at Intercomp Europe Limited.

Mark Browne / Quality Manager
June 9, 2014

Operations

Controls

On/Off

Press this button to turn the unit on. The unit tests itself; when these tests have completed successfully, the system begins weighing. Press this button again to turn the scale off.

ZERO

Tells the spring tester to display a zero weight. This button should be used any time the tester shows a non-zero value with no weight on the pad. If you press ZERO with weight on the pad, that weight becomes the zero condition for the scale. When this weight is removed, a negative weight shows until the system is zeroed again. **NOTE:** if this negative number is too large to fit on the display, the scale will display 'zero' until you press ZERO.

The tester contains a feature called Auto Zero Tracking (AZT), which corrects for slight zero changes during normal operation. If small weights are added slowly, the spring tester could zero them off.

Backlight
Press this key to toggle the backlight on and off.

Units Switching (lb and kg)
The coil spring tester can toggle between lb and kg. To switch units simultaneously press and hold the ZERO and backlight keys. After pressing and holding these keys for a few seconds, the unit will momentarily display:

1) "*H9S*", if you have now switched to display in kgs.
2) "*LbS*", if you have now switched to display in lbs.

Options menu
The options menu allows access to the following functions: Peak mode, Print, Average rate, Auto-off, Print Mode, and baud rate. To enter into the options menu, simultaneously press the ZERO and backlight keys. The display will show "*PEAH*". Press the Zero key to scroll through the menu options. To use or edit a specific function, simultaneously press the ZERO and backlight keys. At this point you will need to enter in a number:

How to enter a number:
Press the backlight key to increment the value of the blinking digit. To move the place of the blinking digit, press the ZERO key. When the desired number is displayed, simultaneously press the ZERO and backlight keys and release.

Options Menu:

Step	Function	Note	Default
PEAH	Peak Mode	Toggles peak and normal mode	*nor*
Prnt	Print	Prints one line	
A.rt	Average Rate	1, is off, 4 is one second - max 120.	*4*
A.oFF	Auto off	000 = off, 1 to 240 minutes	*0 10*
Prt.t	Print Mode	*Prnt* = demand print, *COnt* = Continuous.	*Prnt*
bAUd	Printer baud rate	1200, 2400, 4800, 9600, 19.2k, 38.4k, 57.6k, or 115k	*9600*

Peak hold mode
In this mode the unit will display only the highest weight applied to the pad - until you press the ZERO key.

To get into peak mode: Access the options menu. When the display shows "*PEAH*", press the backlight key and release. The display will read: "*PH*" and the tester will return to measurement mode and will display the peak force.

To return back to normal measurement mode, repeat the above procedure (display will show "*nor*"). The unit will always turn on in 'normal' operating mode.

Print
Reserved for a future update.

Average Rate
The Average rate is the number of past readings that are averaged together to make a reading. The default average rate is 4.

To adjust the average rate: Access the options menu. Press ZERO until the display reads "*A.rt*". Press the backlight key and release. Enter the desired average rate. The default rate, 4, is the equivalent to one second. To save the setting, simultaneously press the ZERO and backlight keys. The display will return to the mode menu. (To turn off this feature enter a value of 0)

Auto-off
The auto off time is how long the scale will remain on without any activity (a key being pressed or a change in weight).

To adjust the auto-off time: Access the options menu. Press ZERO until the display reads "*A.oFF*". Press the backlight key and release. Enter the auto-off time (in minutes). To deactivate auto-off, enter 0. The maximum time is 240 minutes. Simultaneously press Zero and backlight keys to save, the display will return to Mode menu.

Print Mode Select (Serial output)
Reserved for a future update.

Baud Rate
Reserved for a future update.

Coil Over Spring Rater Operating Tips.

Overview

Intercomp's coil over spring rater is the most versatile spring rater made by Intercomp to date. It can be used as a coil-over rater, coil-over compressor, or coil spring tester with appropriate accessories.

Coil-Over Rater Basic Use and Operation

1. Scale the race vehicle as it is to be raced.

2. With the vehicle at ride height ready to race measure the center to center length of your shocks. The same steps to settle the vehicle suspension you currently use for setting ride heights and weight percentages should be used for this process.

3. Document these values for future use.

4. Elevate the vehicle for service.

5. Label the coil over's location on the assembly.

6. Remove the coil over assembles from the vehicle.

7. Measure the center to center free length of the shock.

8. Adjust the center to center distance of the shock mounts to ½" longer than your maximum center to center the free length of your longest shock by loosening the handles and flanged nuts on front of the device.

9. Tighten the fasteners once this step is complete.

10. Install the coil over in the upper clevis using the provided pin.

    a. ½" shock mounts come standard.

    b. 5/8" shock mounts are available if required for your application.

11. Adjust the height of the lower clevis by extending the ram with the provided jack handle.

12. Install your shock into the lower clevis using the provided pin.

    a. The lower pin must be slid all the way into the clevis to ensure the pin does not interfere with the travel indicator.

13. Zero the indicator.

14. Zero the travel indicator.

15. Turn the mounting pins so that the flats are horizontal and hook a tape measure on one flat while reading the shock center to center length on the opposite pin.

16. Compress the assembly until the center to center length of the shock is the same as it was installed in the vehicle.

17. Record the displayed force. This value and length can now be used to install any spring combination on that corner while maintaining ride heights.

NOTE: High rebound shocks will take additional time for the jack to return to zero once the relief valve is opened.

Coil Over Spring Compressor Operating Tips

Warning: If the user is trying to dis-assemble a coil over the jack should be extended approximately the distance the spring is compressed.

Overview

The Intercomp Coil-over Compressor is to be used on Intercomp Coil-Over Raters; Intercomp adapters provided at purchase (4).
   a. Additional adapter sets are available from your local Intercomp Dealer.

Intercomp's Coil-Over compressor adapters are to be mounted in series with 2.5" springs and are compatible with any coil-over spring adapter on the market. This allows the user to compress springs ranging from 2.5" to 5.5" with the correct adapters.

Use and Operation

1. Remove the indicator and load cell mount of your COSR by loosening the handles and flanged nuts on front of the device and sliding the assembly off of the frame.
2. Install the coil over compressor with the concaved face of the center hole facing up.
3. Reinstall the components removed in step 1 at this time.
4. The height of these components should be high enough to not interfere with compressing the coil over assembly.
5. Measure the compressed height of the coil spring assembly.
6. Subtract the value from step 5 from the free length of the spring assembly.
7. Use the provided jack handle to extend the ram the difference calculated in step 6.
8. Install the coil over assembly you wish to disassemble with the body of the shock installed in the lower shock mount using the provided pin.
9. Slide the coil over compressor bracket down to the top of the coil over compressor adapter. (this should be installed in series with the spring)
10. Tighten the adjustable handles on the coil-over compressor.
11. Compress the spring by extending the ram using the provided jack handle.

12. Remove the coil over kit from the assembly once there is adequate space to.

13. Loosen aluminum knob at the base of the jack to release force on applied to the spring.

Caution there may load on the coil over assembly.

14. Verify that the spring floats freely and remove the pin.

15. Remove the shock and spring and proceed as desired.

16. To store the coil over compressor reverse steps 1-3 or remove the upper shock pin and slide the compressor to the top of the assembly just bellow the load cell. (Make sure the compressor is not touching the load cell as this will vary readings.

NOTE: High rebound shocks will take additional time for the jack to return to zero once the relief valve is opened.

Coil Spring Rater Operating Tips

Overview

The Intercomp Coil-over spring rater may also be used to rate springs. The process described below is for rating coil springs in their intended travel range.

Use and Operation

1. Remove the spin on clevises used to mount coil-over assemblies in the Coil over spring rater.

2. Select the proper plate for the top of the spring to be checked. One side is designed for springs with a "pigtail".

3. Install the coil spring rater adapter on to the upper threaded adapter.

4. Tighten the adapter so that it is snug.

5. Install the upper spring perch by spinning it on to the adapter you installed in steps 2 and 3.

6. Tighten the spring perch so that it is snug.

7. Place spring into the spring tester, flat end down. The spring cannot be rated if it does not have one flat end.

8. Center the spring in the upper and lower plates. If the spring has an ungrounded end (coil-over) the spring must use the entire upper support spiral.

9. Lower the upper spring perch by loosening the handles and flanged nuts on front of the device.

10. When rating springs with less than 10" of combined preload and travel set the upper spring perch ½" above the coil spring to be tested.

11. Tighten the fasteners once this step is complete.

12. Use the provided jack handle to extend the ram and compress the spring until a weight registers on the digital display. The spring should barely touch the top plate.

13. ZERO on the travel indicator. Then compress the spring 1" to achieve a pre-load.

14. ZERO weight display and travel indicator.

15. Compress the spring exactly 1" higher, and then record the displayed weight. This indicates the initial spring rating in Pounds per Inch (when in "pounds" mode).

16. Compress the spring **exactly 1" higher**, and then record the displayed weight. This indicates the initial spring rating in Pounds per Inch (when in "pounds" mode).

17. Repeat steps 15 and 16 to determine linearity characters of the spring.

18. Gradually release pressure from the jack, and remove spring.

Error Messages

Message	Meaning
'EEPE'	**EEPROM FAILURE Calibration information lost or corrupted**
Calibration information is held in a special permanent memory area. A checksum code is generated and written to this memory during the calibration process. Each time the power is turned on this code is regenerated and compared to the stored value. If a change is found this error message is displayed. Recalibration may clear the error display, but if the problem persists the control panel will have to be replaced.	
'Ad 1'	**A/D converter failure**
The A/D circuit board has indicated a fault and needs to be repaired or replaced.	
'LCb 1'	**Power-up Self-Test has detected a load cell error**
The load cell may have failed or there is a bad connection. If the load cell resistance checks are good then the A/D circuit board has indicated a fault and needs to be repaired or replaced.	
'LC 1'	**Run-time checking has detected a load cell error**
The load cell circuit may have failed or there is a bad connection. . If the load cell resistance checks are good then the A/D circuit board has indicated a fault and needs to be repaired or replaced.	
'L.bAt'	**Low battery voltage**
This message displayed intermittently indicates that the control panel has measured the battery voltage and found it to be too low. The most likely cause is that the batteries may need to be changed. If a new set of batteries fail to correct the situation, then the control panel may need to be replaced. Also check the battery holder and wiring.	
'CAP'	**Overload or calibration information lost or bad load cell**
The control panel has detected a weight reading that is larger than expected. This may be caused by the application of too much weight to the scale. If this display is seen when there is no weight on the scale, then the most likely causes are a defective load cell or defective control panel. To isolate the problem, measure the signal across pins two and three on the load cell connector on the control panel. This should be between zero and one millivolt. If found to be higher or lower, then the load cell system must be checked. See procedure elsewhere in this manual. If the signal is within this range then the calibration data may be lost. Attempt to recalibrate the scale. If this does not clear the problem, then replace the control panel.	
'2Er0'	**Zero Range Error**
Scale tried to zero off a load outside the range specified in the zero range setting. Remove any load and press zero.	
'HELd'	**Key is held down**
If this message is displayed with no key pressed examine the key pad and key pad connector ribbon.	
'd iSP'	**Number can't be displayed**
The most common cause of this error is pressing the zero key with a full load on the scale. When the load is removed, the full number with a minus sign will not fit on the display. Pressing the zero key again will clear this display.	

Changing the Battery

Turn the power off. Slide the battery hatch down. Remove the battery from the case and detach the old battery. Connect the new 9V battery and return to the case. Replace the cover.

How to reach Intercomp Service

Things to know:

Inform the Service Dept. that the product is a Coil-Over Spring Rater.
When was the Coil-Over Spring Rater purchased?
Where was the Coil-Over Spring Rater purchased?

For Intercomp Service call or fax:

>   FAX # (763)-476-2613
>   (763)-476-2531
>   **1-800-328-3336**

Or fill out Service Support Form at:

>   www.intercompcompany.com

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