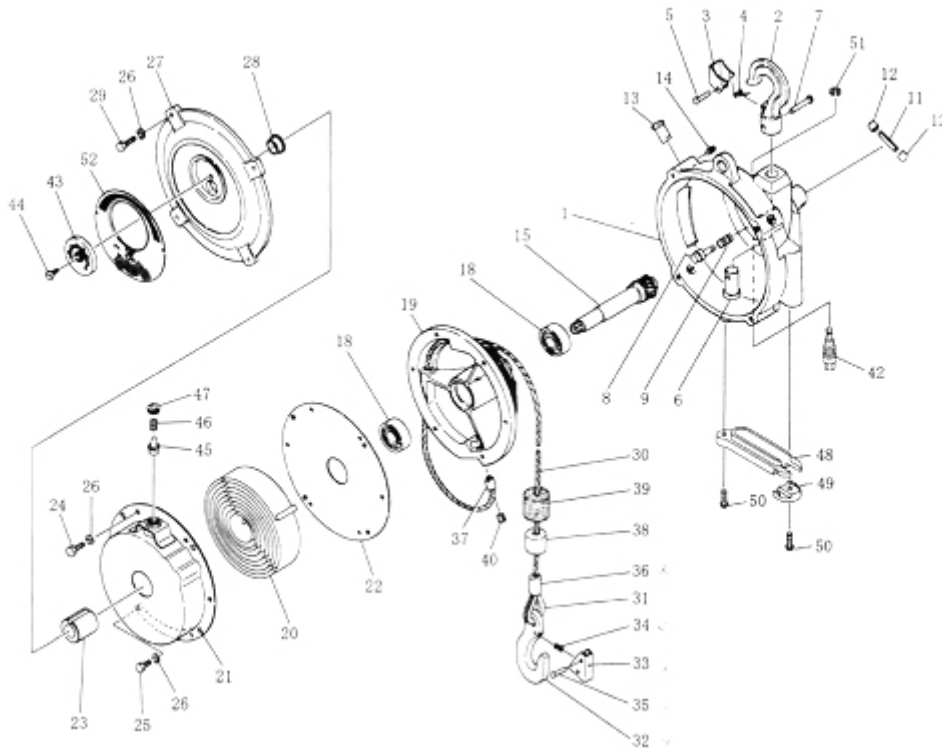


## INSTRUCTION MANUAL FOR SPRING BALANCER

### EXPLODED VIEW OF SPRING BALANCER



### SPARE PARTS LIST FOR TRITORC E SERIES SPRING BALANCERS

Index Nos.	Name of Parts	Model No		Quantity
		E-9	E-15	
1	Casing	Aluminium Alloy Casting	-	1
2	Casing + 11,11A,11B,11C	-	Aluminium Alloy Casting	1
3	Cover	Aluminium Alloy Casting	Aluminium Alloy Casting	1
4	Drum	Aluminium Alloy Casting	Aluminium Alloy Casting	1
5	Drum Cover	-	Aluminium Alloy Casting	1
6	Spiral Spring	Carbon Tool Steel	Carbon Tool Steel	1
7	Spindle	Cold Finished Steel Bar	Cold Finished Steel Bar	1
8	Ratchet	Cold Rolled Carbon Steel Sheet	Cold Rolled Carbon Steel Sheet	1

9	Screw (M5x12)	-	-	1
10	Screw (M5x18)	-	-	4
11	Screw (M6x12)	-	-	1
12	Screw (M5x10)	-	-	4
13	Screw (M5x20)	-	-	1
14	Upper Hook	Rolled Steel For General Structure	Rolled Steel For General Structure	1
15	Safety Plate	Cold Rolled Carbon Steel Sheet	Cold Rolled Carbon Steel Sheet	1
16	Spring	Hard Drawn Steel Wire	Hard Drawn Steel Wire	1
17	Rivet (3x11)	-	-	1
18	Rivet (3x17.5)	-	-	1
19	Spring Cover	Cold Rolled Carbon Steel Sheet	-	1
20	Hook Shaft	-	Cold Finished Steel Bar	1
21	Wire Rope (3x1180)	-	-	1
22	Wire Rope (3x1500)	-	-	1
23	Wire Stopper	Aluminium Alloy Road Bar	Aluminium Alloy Road Bar	1
24	Buffer	Nitrile Butadiene Rubber	Nitrile Butadiene Rubber	1
25	Lower Hook	Cold Rolled Carbon Steel Sheet	Cold Rolled Carbon Steel Sheet	1
26	Name Plate	Aluminium Alloy Plate	Aluminium Alloy Plate	1

**Selection of suitable model**  
**( Refer to illustration of Fig.1 )**

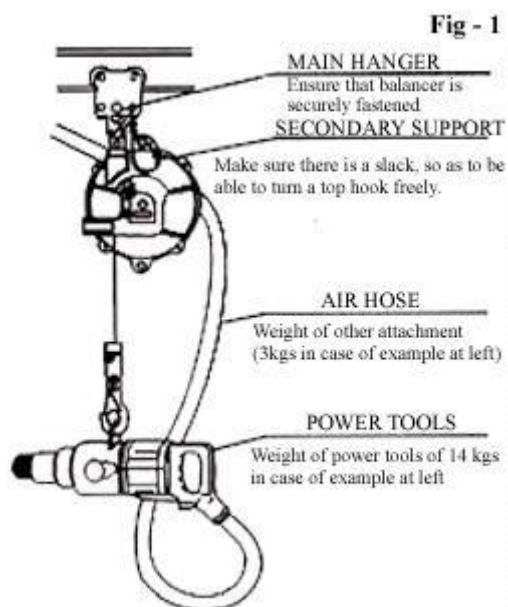
**1) Select the correct model of spring balancer for the loading weight of suspension.**

**When selecting a balancer, first consideration should be given to the weight the total load to be balanced (tool plus cable or hose plus other attachments).**

Example :

Weight of Power Tool	+ Weight of Attachment	=	Weight of Total Load
(14 kgs)	+ (3 kgs)	=	(17 kgs)

Select the TRITORC Spring Balancer Model E - 1 5 in the above case



**In case the weight of total load is between maximum capacity of one spring balancer and minimum capacity of another spring balancer, for instance. Where the total weight is 9 kgs.**

**It is better to select a bigger capacity spring balancer, Model E-15 ( 9-15 kgs in balance range ) than E-9 (9 kgs in balance range ). Otherwise it may shorten the life of the spirial spring if smaller model is selected. E-15 in this case is selected.**

### Manner of suspension

**Make sure the following points, and suspend at the correct place :**

- » Ensure that the balancer is fastened securely.
- » It must be in a position to operate smoothly, even if, the spring balancer be used in slanting position.
- » Be sure to fit a secondary support chain or wire rope sling.
- » ( Make sure there is enough slack in secondary support chain, so as to be able to turn the top hook freely ).
- » Avoid possibility of colliding with another spring balancer, when installing two or more balancers on a trolley.

**NOTE :- ALWAYS ENSURE THAT THE TOP HOOK, HOLDING THE BALANCER, IS FREE TO ROTATE.**

### Adjustment of Spiral Spring

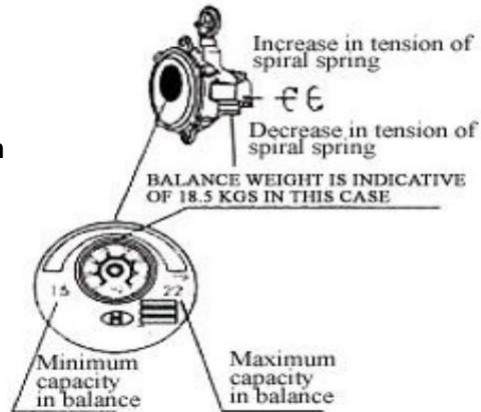
( Refer to illustration of Fig.2 )

2).Adjust the tension of spiral spring to suit for loading weight and working condition by turning of worm.

Tension of spiral spring increases when turning the worm clockwise direction. To decrease the tension of spiral spring for load in lesser weight turn worm counterclockwise direction. You can judge the approximate loading weight through the plastic gauge.

When supplying the products from factory, the tension of spiral spring is set at a medium position.

**NOTE :- AVOID ADJUSTING THE SPIRAL SPRING OVER OR BELOW THE RATED CAPACITY OF THE BALANCER. USE BALANCER ALWAYS WITHIN THE BALANCE RANGE. IF THE SPRING IS WOUND OVER ITS MAXIMUM CAPACITY, IT WILL SHORTEN THE STROKE OF THE CABLE AND DECREASE THE LIFE OF SPIRAL SPRING. AND IF THE SPRING IS LOOSEMED TO LOWER TENSION THAN MINIMUM CAPACITY, SAFETY DEVICE WILL ACT AND STOP OPERATION PREMATURELY.**



Replacement of attached equipments

( Refer to illustration of Fig.3 )

3).The following procedure should be adopted, in the following order if it is necessary to replace any parts during operation of spring balancers,

- » Pull all length of cable (wire rope) out of drum, and set stopper pin (8) at a groove as illustrated on fig. 3 and lock drum (19).
- » After making sure of locking the drum, change attached parts.

**NOTE :-IT IS VERY DANGEROUS TO ATTEMPT TO REPLACE ANY PARTS BEFORE MAKING SURE THE DRUM IS LOCKED BY THE STOPPER PIN TO PREVENT THE SPRING SNATCHING BACK. THEREFORE, DO NOT RELEASE MANUAL DRUM LOCK WITHOUT ATTACHING FULL LOAD.**

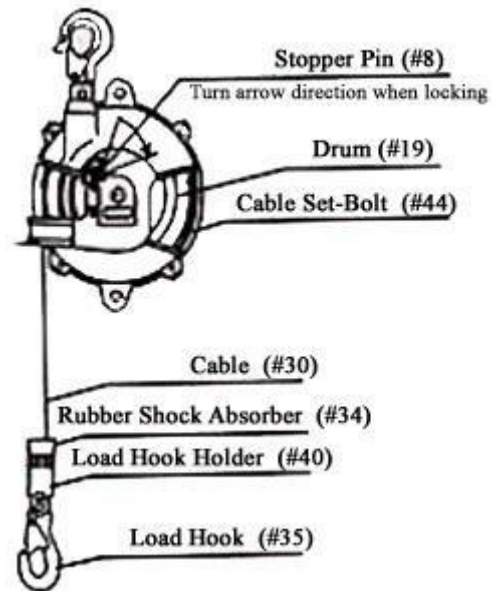
If weight of total load to be attached afresh is different from previous equipment, re-adjust the tension of spiral spring anew.

Replacement of Cable

(Refer to illustration of Fig.3)

- » Pull all length of cable (30) out of drum and set stopper pin (8) at a groove (move to position of arrow on illustration of Fig. 3), and lock drum (19). In this condition, cable set-bolt (44) must be in a position of illustration as shown in Fig. 3.
- » Take attached equipment off load hook (35). (DETACH ATTACHED EQUIPMENT FROM LOAD HOOK AFTER MAKING SURE OF THAT THE DRUM IS LOCKED. OTHERWISE THERE IS A DANGER OF THE CABLE BEING PULLED SUDDENLY IF CONDITION OF LOCK IS INSUFFICIENT)
- » Remove cable set-bolt and take out cable completely from drum.
- » Remove load hook (35), rubber shock absorber (34), adjustable cable stop (52) and adjustable cable stop taper nut (53) from cable. And, exchange damaged or worn-out cable for new one.
- » Fix cable complete on drum. The manner of re-assembling of cable complete in reversed order of disassembly.
- » Fix cable set-bolt. Mount equipment to be attached on load hook and release stopper pin.

Fig - 3



**DO NOT RELEASE STOPPER PIN PRIOR TO ATTACHMENT OF EQUIPMENT.**

**Procedure of Disassembly (disassemble in order of description)**

**When the spring balancer is to be disassembled the procedure indicated below is recommended (refer to exploded view of spare parts).**

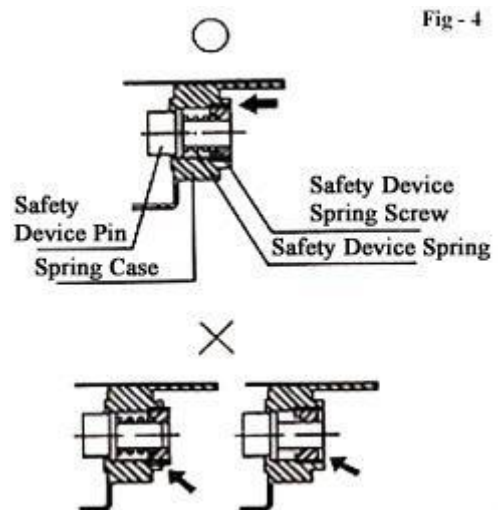
- » Take attached equipment off load hook (35), And detach spring balancer from trolley or beam.
- » Remove gauge (47).
- » Turn worm (46) counter-clockwise direction and loosen spiral spring (20) and remove worm. (worm come off case (1) when spiral spring is loosened completely).
- » Remove hex cap screw (14) and take out safety stop arm (13).
- » Remove cable set bolt (44), and take out cable (30) from drum (19).
- » Remove casing cover (27).
- » Take spring case (21), drum (19) and spindle (15) simultaneously off case.

- » Pull out spindle, and take spring case off drum.
- » Pull out spindle, and take spring case off drum.
- » Take bushing (23) and safety device pin off spring case.

### Procedure of Assembly

( Refer to illustration of Fig.4 )

- » Install bushing (23) into spring case (21).
- » Install spindle (15) and spring case on drum.  
After making sure that stopper pin (8) is not at a position of drum lock, assemble drum, spindle and spring case into case and set casing cover (27).
- » Install safety stop arm (13). Fasten hex cap screw 14 correctly.  
After installation thrust washer onto the end of worm (46), assemble worm with turning clockwise direction.
- » Install cable (30). Fix cable set bolt (44).



### Load and Inspection of Operation

- 2-1).** Attach an equipment on the load hook. (35) and adjust the tension of the spiral spring by turning the worm to take up the length of stroke of cable. (It is recommended to set the balancer at a medium position of tension of spiral spring).
- 2-2).** Install safety device pin (49). safety device spring (50) and safety device spring screw (51).The upper surface of the safety device spring screw should be adjusted to same level of surface of spring case.
- 2-3).** Attach gauge (47), Adjust the indication of gauge with loading weight.

### MAINTENANCE AND INSPECTION

**For the purpose of preventing accidental falling, inspection should carried out at least one time on a monthly basis.**

- » Make sure whether the bolts of the respective parts are not loosened.
- » Make sure whether top hook and load hook are not worn-out or damaged.
- Make sure whether cable is not torn or worn-out.
- » ( take care to check a condition of tear, kink of wire rope and damages of locking part of end on cable ).
- » Make sure whether safety device is operated correctly.

**In the event that any part of the spring balancer has broken or damaged, repair immediately through your maintenance department or contact TRITORC EQUIPMENTS PVT. LTD. IMMEDIATELY.**

## TIPS ON USE OF BALANCERS AND SECONDARY SUPPORT CHAINS

