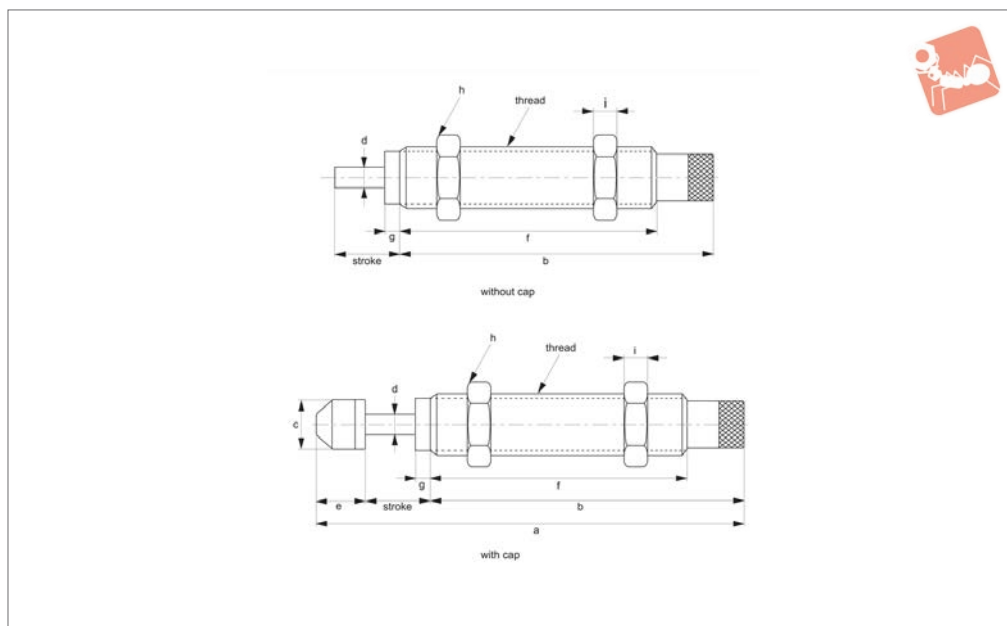




# Shock Absorber, Adjustable

## M14 - M20

# Shock Absorbers



## 68020

SHOCK ABSORBERS

### Material

Outer Tube: STKM11A, hardened and blackened.  
Piston Rod: AISI 1045 hardened to HV940°, chrome plated.  
Return Spring: DIN GWP.  
Muffler Cap: urethane rubber.  
Seal: nitrile rubber.

### Technical Notes

Adjustable shock absorbers have an adjustment collar at their base to enable setting of optimum deceleration of unit to suit application.  
Supplied with rubber muffler cap as standard, this is removable - see introductory technical notes for guidance.

### Important Notes

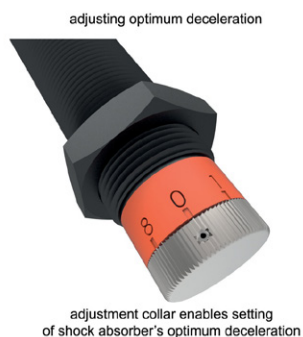
For correct product selection refer to Product Selection Formulae and Calculation pages, and associated Capacity & Selection Charts.

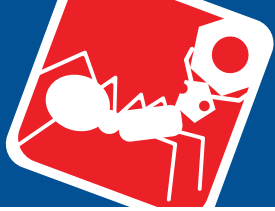
Order No.	With / without cap	Stroke mm	Per hour (ETc) Nm max.	Nm per cycle (Et) Nm max.	Effective mass (Me) kg max.	Speed (v) m/s max.	Operating temperature °C	Weight g
68020.W0139	Without	10	22000	12	35	3.0	-10 to +80	66
68020.W0140	With	10	22000	12	35	3.0	-10 to +80	66
68020.W0141	Without	10	25000	20	80	3.0	-10 to +80	90
68020.W0142	With	10	25000	20	80	3.0	-10 to +80	90
68020.W0143	Without	15	26000	24	100	3.0	-10 to +80	120
68020.W0144	With	15	26000	24	100	3.0	-10 to +80	120
68020.W0145	Without	25	27500	28	140	3.0	-10 to +80	194
68020.W0146	With	25	27500	28	140	3.0	-10 to +80	194
68020.W0147	Without	12	27500	22	130	3.0	-10 to +80	200
68020.W0148	With	12	27500	22	130	3.0	-10 to +80	200
68020.W0199	Without	16	28500	28	200	3.5	-10 to +80	222
68020.W0200	With	16	28500	28	200	3.5	-10 to +80	230
68020.W0201	Without	16	27500	28	200	3.0	-10 to +80	230
68020.W0202	With	16	27500	28	200	3.0	-10 to +80	230
68020.W0203	Without	25	30000	39	312	3.5	-10 to +80	232
68020.W0204	With	25	30000	39	312	3.5	-10 to +80	240
68020.W0205	Without	20	29000	34	298	3.5	-10 to +80	235
68020.W0206	With	20	29000	34	298	3.5	-10 to +80	235
68020.W0207	Without	50	52000	69	420	3.5	-10 to +80	330
68020.W0208	With	50	52000	69	420	3.5	-10 to +80	330

Order No.	Thread	a	b	c	d	e	f	h	i
68020.W0139	M14x1,5	90.3	71.7	10.3	4	8.6	57.3	14	4
68020.W0140	M14x1,5	90.3	71.7	10.3	4	8.6	57.3	14	4
68020.W0141	M14x1,5	109.5	88.5	12	4	11.2	72.5	19	5
68020.W0142	M14x1,5	109.5	88.5	12	4	11.0	72.5	19	5
68020.W0143	M14x1,5	128.2	102	12	4	11.2	86.0	19	5
68020.W0144	M14x1,5	128.2	102	12	4	11.2	86.0	19	5



Order No.	Thread	a	b	c	d	e	f	h	i
68020.W0145	M14x1,5	153.2	117	12	4	11.2	101.0	19	5
68020.W0146	M14x1,5	153.2	117	12	4	11.2	101.0	19	5
68020.W0147	M16x1,5	99.0	76.5	14	4	11.2	54.9	19	6
68020.W0148	M16x1,5	99.0	76.5	14	4	11.2	54.9	19	6
68020.W0199	M20x1,5	-	117.0	-	6	-	101.0	26	7
68020.W0200	M20x1,5	158.0	117.0	18	6	15.8	101.0	26	7
68020.W0201	M20x2,0	148.3	117.0	17.8	6	15.3	101.0	26	7
68020.W0202	M20x2,0	148.3	117.0	17.8	6	15.3	101.0	26	7
68020.W0203	M20x1,5	157.3	117.0	17.8	6	15.3	101.0	26	7
68020.W0204	M20x1,5	157.3	117.0	17.8	6	15.3	101.0	26	7
68020.W0205	M20x1,5	152.3	117.0	17.8	6	15.3	101.0	26	7
68020.W0206	M20x1,5	152.3	117.0	17.8	6	15.3	101.0	26	7
68020.W0207	M20x1,5	239.3	174	17.8	6	15.3	158.0	26	7
68020.W0208	M20x1,5	239.3	174	17.8	6	15.3	158.0	26	7





## Shock Absorbers benefits and features

Shock Absorbers are widely used in industry where the speed, direction or movement of objects must be changed or stopped. Without suitable methods of control the kinetic energy inherent in many moving objects, which occur in manufacturing, can result in increased machine wear and even machine damage.

Ideally any method of "shock absorption" should provide two key features:

- 1) Bring the moving object to rest quickly, smoothly and without rebounding forces
- 2) In-built reliability and safety

Shock Absorbers are able to quickly convert the kinetic energy of a moving object into heat and to dissipate this into the air, and provide a constant linear deceleration of an object throughout its entire impact stroke, to quickly, smoothly and quietly bring a moving object to rest with the lowest reaction force and in the shortest time. All of these features mean increased manufacturing productivity, extended machine life, and improved efficiency.

### Traditional buffering methods:

- Springs
- Dash Pots
- Air Buffers
- Rubber bumpers

### Costs associated with outdated cushioning methods:

- Loss of production
- Increased machine wear and tear
- Increased maintenance cost
- Increased vibration and noise pollution
- Varying and inconsistent dampening forces, with non-linear or high peak forces at some point in their stroke.

Traditional buffering methods can only dissipate a small percentage of the kinetic energy of a moving object, the remainder is stored (rather than dissipated) as elastic energy which results in high resistance and rebounding forces toward the end of the impact stroke.

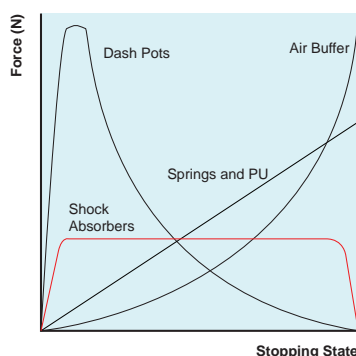
Wixroyd Shock Absorbers are designed to stop a moving object smoothly and quietly from the beginning to the end of its impact stroke. Their design enables a constant resistance force or linear deceleration throughout the impact stroke, quickly converting the kinetic energy of the moving object into heat which is quickly dissipated into the air. A linear deceleration curve, as achieved by our shock absorbers, brings an object to rest in the shortest time while reducing damaging impact forces.

**Energy Capacity:** Shock absorbers can absorb more energy, without increasing deceleration or reaction forces.

**Stopping Force:** Shock absorbers provide smooth deceleration of parts, which means less machine wear and hence reduced maintenance.

**Stopping time:** Shock absorbers bring moving loads to rest more quickly, increasing productivity.

- Consistent and reliable dampening force or linear deceleration, throughout entire impact stroke
- Smoother motion and deceleration of moving parts
- Increased productivity
- Extended machine life and improved efficiency
- Simplified application design and build costs
- Reduced maintenance costs
- Improved health and safety, through reduced vibration and noise pollution



**Dashpots:** produce large peak forces at beginning of impact stroke, abruptly slowing load - however braking force quickly declines.

**Springs & Rubber Buffers:** energy is stored rather than dissipated, resulting in rebounding of the load.

**Air Buffers:** initial braking force is low, but due to the compressibility of air it increases sharply toward later stages of stroke, resulting in inconsistent braking force.

**Shock Absorbers:** designed to stop a moving object smoothly and quietly from beginning to end of its impact stroke. Their design enables constant resistance force or linear deceleration throughout impact stroke, they quickly convert kinetic energy of a moving object into heat which is quickly dissipated into the air.

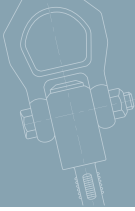
## Why do we need shock absorbers?

## The cost of outdated buffering methods

## Benefits of using Wixroyd Shock Absorbers

## Advantages of using Wixroyd Shock Absorbers

## Comparison of shock absorbers vs. other methods



### Wixroyd Shock Absorbers are available in two primary types

#### Self-compensating



Self compensating shock absorber **68001**

Our Self-Compensating Shock Absorbers are effective for a stated range of Effective Mass ( $M_e$ ), and are self-compensating within this range - see selection charts. As long as the applications effective mass remains within the given range then no additional adjustment is required for changes in weight, speed or propelling force.

See models: **68001**, **68002**, **68003**, **68004**, **68008**, **68012**



Self compensating shock absorber **68002**

Each Self-Compensating Shock Absorber is available in three standard max. Impact speed (v-m/s) variations:

- 1 - high impact speed
- 2 - medium impact speed
- 3 - low impact speed

For specific max. impact speed values please refer to the selections charts and the specific product tables.

For hard impact at the start of a stroke it is advisable to choose a high impact speed model, for hard set down at the end of a stroke it is advisable to choose a medium or low impact speed model, or to move up to the next higher bore size

#### Adjustable



Adjustable shock absorber **68020**



Set collar to 0 at initial installation



After a few cycles adjust collar setting to suit application

Adjustable Shock Absorbers have an adjustment collar at their base (with a scale of 0-9), which enables adjustment of the Shock Absorber's optimum deceleration to suit the application.

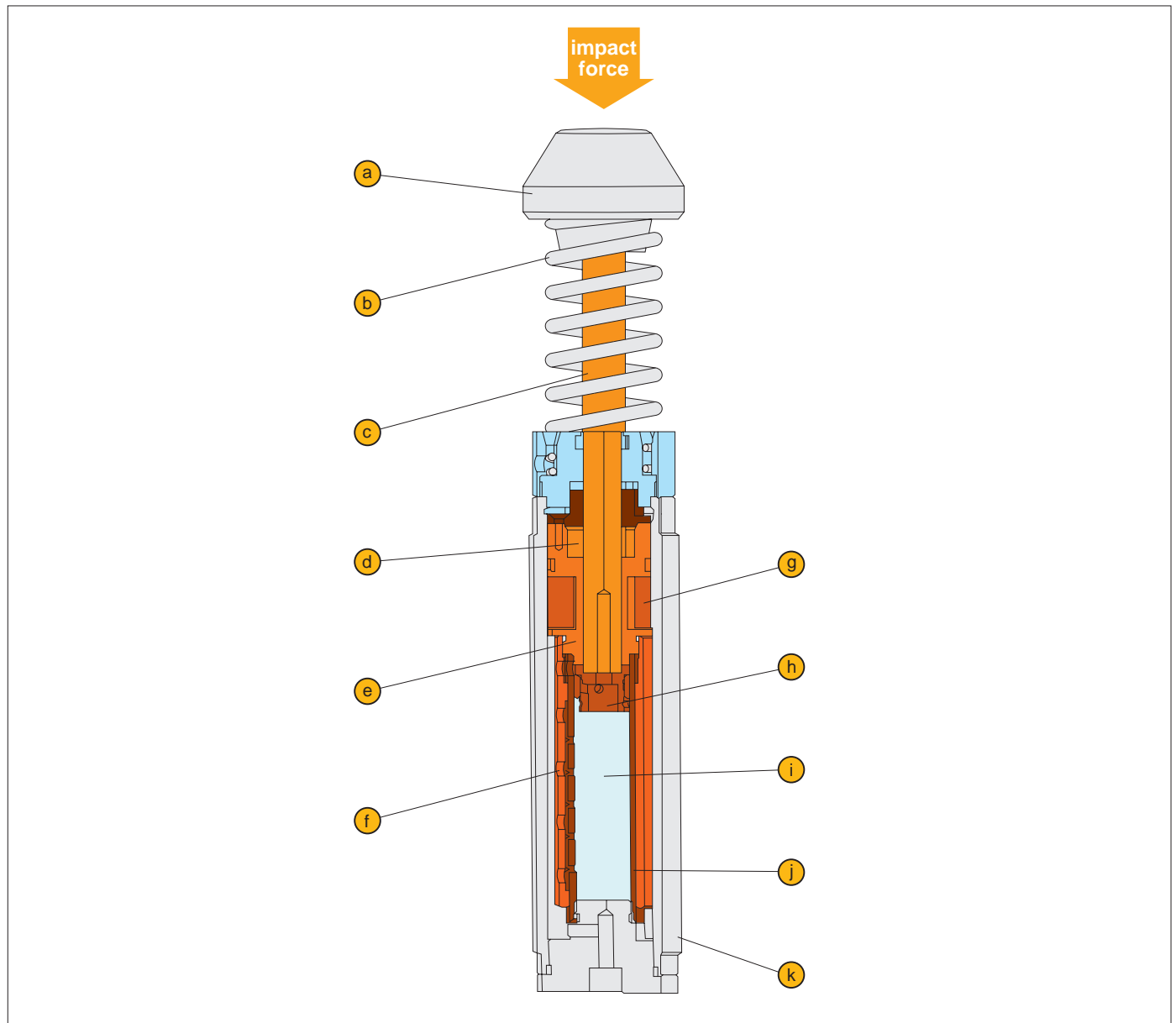
After initial installation, the Shock Absorber should be cycled a number of times to settle, and then the adjustable collar turned to the desired position for the application.



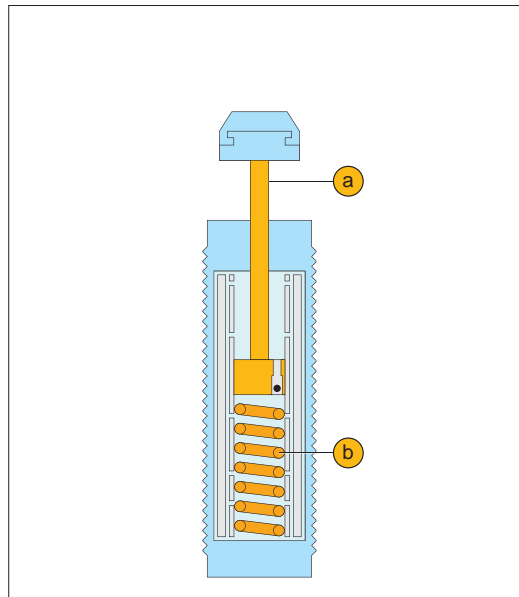
### Inside a Wixroyd Shock Absorber

The design of Wixroyd Shock Absorbers is beautifully simple and beautifully effective. Made from high quality materials and components, they provide the highest performance and reliability.

#### Shock absorber design

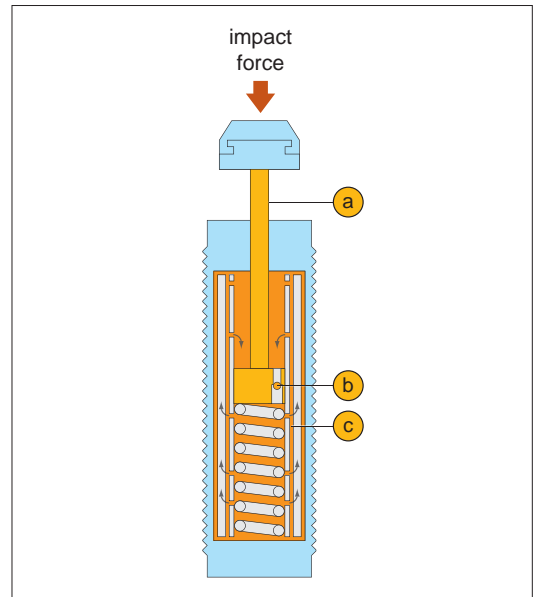


- |  |  |
|--|--|
| <b>a</b> Impact Cap  | <b>g</b> Accumulator; neoprene rubber                |
| <b>b</b> Return Spring; DIN GWP (external and internal models avai.) | <b>h</b> Check Valve                                 |
| <b>c</b> Piston Rod; AISI 1045, hardened to HV940°, chrome plated    | <b>i</b> Fluid                                       |
| <b>d</b> Seal  | <b>j</b> Inner Tube                                  |
| <b>e</b> Bearing   | <b>k</b> Outer Tube; STKM11A, hardened and blackened |
| <b>f</b> Orifices  |  |



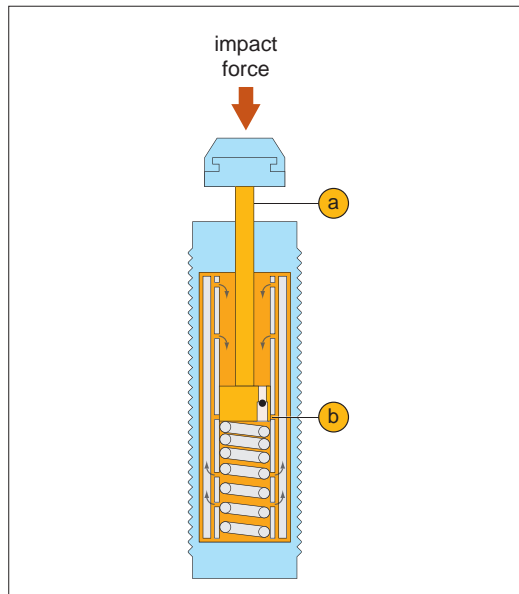
### At rest

1) Shock Absorber at rest, piston rod (1), fully extended through force exerted on it by return spring (2).



### Initial impact

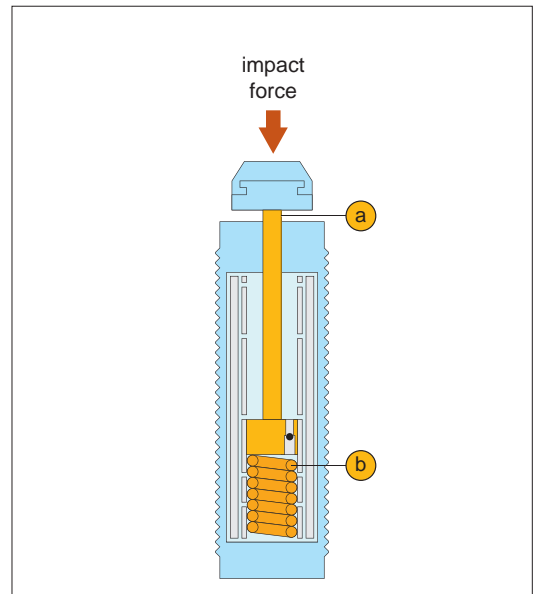
2) Moving load impacts piston (1), which moves into shock absorber body increasing pressure in chamber.  
3) Piston rod check valve closes (2). Hydraulic oil behind the piston head is initially able to escape/vent into the accumulator (3).



### Continued impact and linear deceleration

4) As load on piston rod (1) increases, the rod continues to move back into the inner tube, as it does so the number of available metering orifices (2) through which the hydraulic oil is able to escape reduces - hence the velocity of the moving load continues to decelerate.

5) The number and position of the orifices are such that the pressure in the inner tube remains constant throughout the entire impact stroke - providing constant linear deceleration. (Number of metering orifices decreases proportionally through length of piston rod.)



### Load brought to rest

6) The moving load is brought to a smooth and quiet stop.

7) When the load is removed the return spring (2) pushes the piston (1), back to its original resting position, ready for the next cycle.