



# ***TUBUS<sup>®</sup> Bumpers***

***Elastomer Products for Energy Control  
Outperform Rubber, Urethane and Coiled Steel***



**ACE Controls Inc.**  
*Innovation in Deceleration and Motion Control  
ISO 9001 Certified*

**01/09(R)**  
**Revised 12/10**

## Absorbs More Energy

**TUBUS Series high performance elastomer bumpers** from ACE Controls are highly engineered products that **absorb more energy per unit of weight and volume than many known materials**. In various applications, these dependable bumpers significantly **outperform rubber, urethane and coiled steel**. TUBUS Series bumpers consistently solve energy absorption problems where other materials have failed or simply don't exist.

**These durable bumpers solve difficult energy management problems in applications involving shock isolation, vibration isolation and return springs**. TUBUS Series bumpers from ACE are reshaping performance standards in cost-effective energy absorption, durability, resilience and application flexibility.

TUBUS Series bumpers are **comprised of a thermal plastic co-polyester material that is excellent in resisting oil, grease, chemicals, salt water, ultra-violet light and microorganisms**. They do not absorb water and will not swell.

The secret is in both the shape and in the proprietary manufacturing process. **Each TUBUS Series bumper is specifically processed to a precise shape to meet the required load rates**.

**The result is a highly tailored, highly engineered product that adds performance and value to each application.**

## Proven Endurance and Resilience

The success of the proven elastomer bumper is demonstrated by the following information:

- ◆ **Thousands of hours in mine trucks without failure**
- ◆ **Many years in rail car impact devices without failure**
- ◆ **Millions of cycles at maximum deflection without failure on step machines for the fitness industry**
- ◆ **More than 10 years in forklift truck masts without failure**
- ◆ **Millions of parts in automobiles without failure**

Proven TUBUS Series bumpers are ideally **suited for applications in the electric drive, heavy corrosive and crane bumper markets** as well as numerous others.

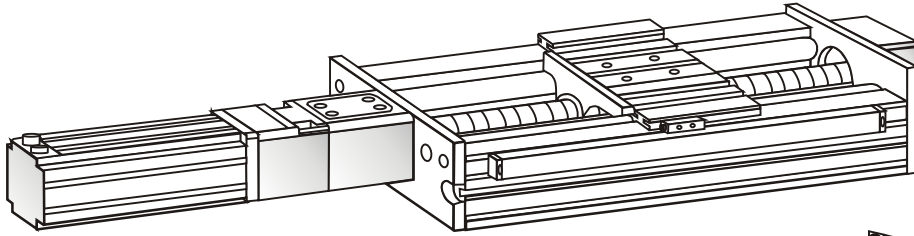
TUBUS Series bumpers from ACE Controls are the lightweight, ultra-strong, exceedingly durable and economical product solution for your bumper application needs.

## Advantages

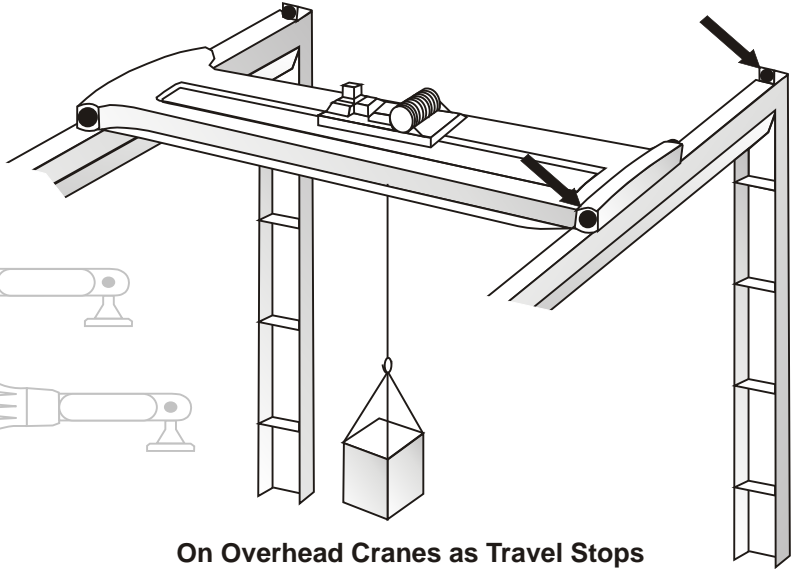
Cost-effective  
Space saving design  
Low weight  
Long life expectancy  
Easily adaptable to existing systems  
Unaffected by oil, grease, chemicals, salt spray, ozone, sunlight, hydraulic fluids or fuels  
Maintenance free  
Wide service temperature range

## TUBUS Bumpers Durability

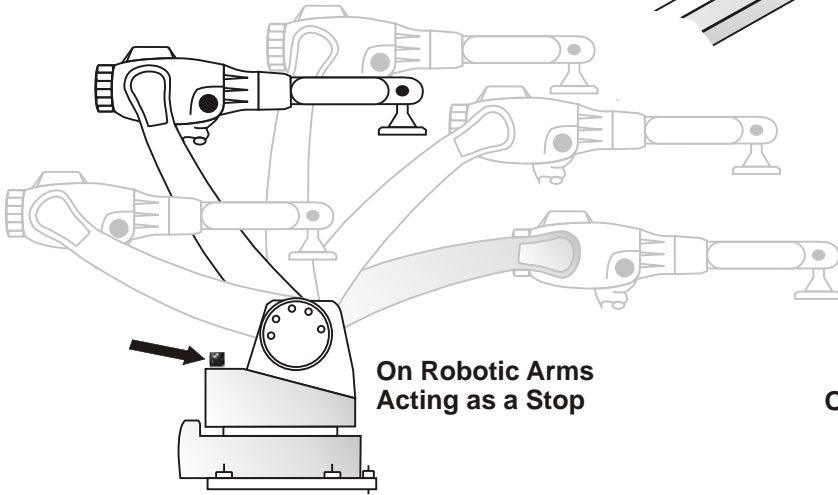
5 times longer life expectancy than coiled steel  
10 times greater than rubber  
20 times greater than urethane



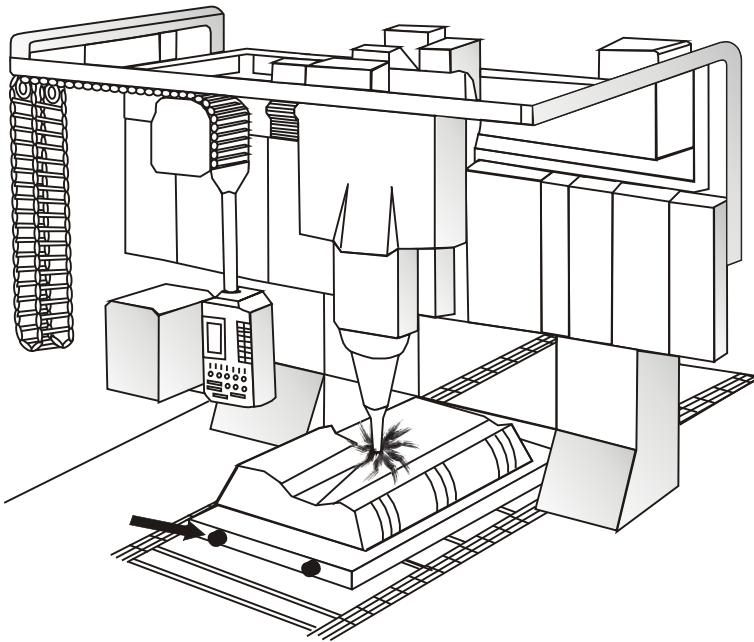
On Electric Drive Units



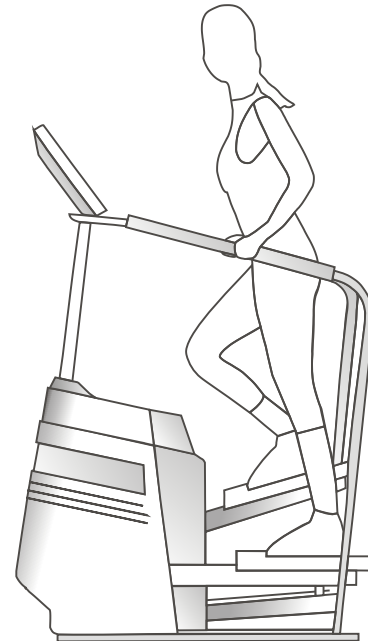
On Overhead Cranes as Travel Stops



On Robotic Arms Acting as a Stop



On Machining Centers as Dampening Elements



As System Cushion Units on Fitness Industry Equipment

**Additional Selected Application Areas Include:**

On equipment in heavy corrosive environments  
Mining equipment

Jounce stops  
Rebound bumpers and stops  
Sawmill equipment

Steel mill equipment  
Paper mill equipment  
Oil well heads



TUBUS TA-Series elastomer bumpers are designed to provide the maximum amount of energy absorption in the minimum amount of space. These dependable units are available in numerous model sizes to handle your energy control needs. **TUBUS bumpers from ACE Controls, in various applications, outperform rubber, urethane and coiled steel.**

### Technical Data

**Service temperature:** -30° to 150°F (-34° to 65°C)

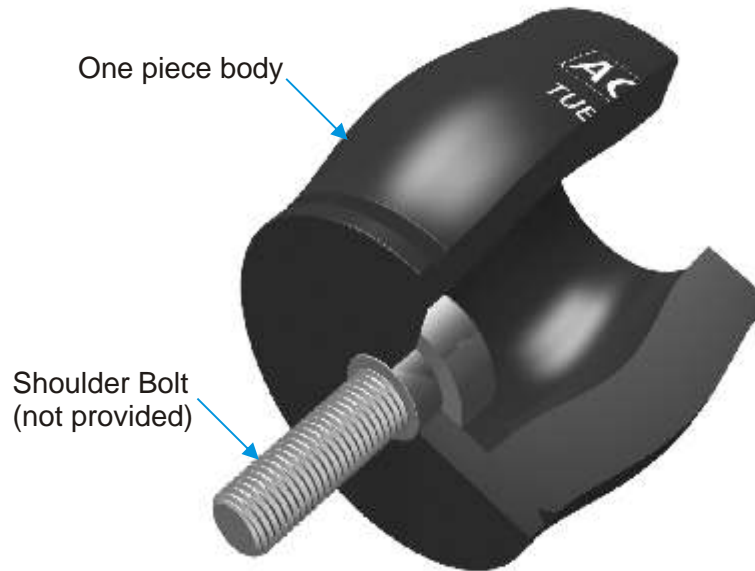
**Energy absorption:** 40 to 66%

**Energy capacity:** 20 to 17,000 in-lbs (2 to 1,921 Nm)

**Peak dynamic force:** 181 to 18,000 lbs (805 to 82,288 N)

**Elastomer material:** excellent resistance to chemicals, salt water, ultra-violet light and microorganisms. Does not absorb water and will not swell.

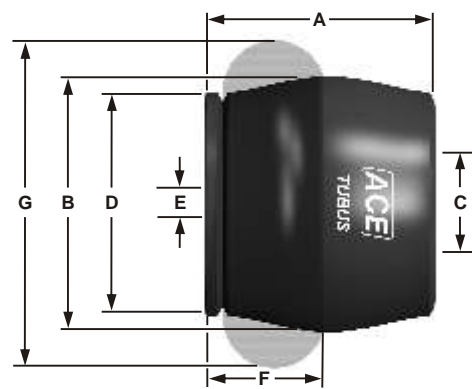
### TUBUS TA-Series Bumpers



### Ordering Information

TA 22-10	
TA-Series	Model Number
TA	12-5 34-14 50-22 70-29 90-38
	17-7 37-16 54-22 72-31 98-40
	21-9 40-16 57-24 80-32 116-48
	22-10 43-18 62-25 82-35
	28-12 47-20 65-27 85-36

## Specifications and Dimensions



Model	E3 Energy Capacity in-lbs (Nm)	Peak Dynamic Force lbs (N)	A Free Height in (mm)	B Free Bulge Diameter in (mm)	C Wrench Opening in (mm)	D Base Diameter in (mm)	E Mounting Hole in (mm)	F Solid Height in (mm)	G Bulge at Solid Height in (mm)	Shipping Weight oz (g)
TA 12-5	20 (2)	181 (805)	0.43 (11)	0.48 (12)	0.23 (6)	0.42 (11)	0.15 (4)	0.24 (6)	0.60 (15)	0.08 (2)
TA 17-7	51 (6)	353 (1,570)	0.61 (15)	0.66 (17)	0.33 (8)	0.60 (15)	0.17 (4)	0.39 (10)	0.82 (21)	0.13 (4)
TA 21-9	89 (10)	494 (2,197)	0.72 (18)	0.81 (21)	0.39 (10)	0.71 (18)	0.21 (5)	0.39 (10)	1.01 (26)	0.14 (4)
TA 22-10	100 (11)	700 (3,114)	0.76 (19)	0.85 (22)	0.41 (10)	0.75 (19)	0.31 (8)	0.40 (10)	1.07 (27)	0.16 (5)
TA 28-12	250 (28)	1,200 (5,334)	1.01 (26)	1.11 (28)	0.56 (14)	0.98 (25)	0.31 (8)	0.53 (14)	1.43 (36)	0.37 (11)
TA 34-14	400 (45)	2,000 (8,896)	1.18 (30)	1.35 (34)	0.66 (17)	1.16 (30)	0.31 (8)	0.63 (16)	1.70 (43)	0.62 (18)
TA 37-16	550 (62)	2,400 (10,675)	1.31 (33)	1.47 (37)	0.72 (18)	1.28 (32)	0.31 (8)	0.69 (17)	1.88 (48)	0.86 (24)
TA 40-16	700 (79)	2,500 (11,120)	1.37 (35)	1.55 (39)	0.80 (20)	1.35 (34)	0.42 (11)	0.73 (18)	2.00 (50)	1.00 (28)
TA 43-18	900 (102)	3,600 (16,013)	1.49 (38)	1.70 (43)	0.79 (20)	1.48 (38)	0.42 (11)	0.79 (20)	2.15 (55)	1.40 (40)
TA 47-20	1,100 (124)	3,300 (14,678)	1.62 (41)	1.83 (47)	0.93 (24)	1.61 (41)	0.55 (14)	0.86 (22)	2.33 (59)	1.70 (48)
TA 50-22	1,400 (158)	3,800 (16,902)	1.77 (45)	1.96 (50)	1.02 (26)	1.71 (43)	0.55 (14)	0.92 (23)	2.51 (64)	2.00 (57)
TA 54-22	1,700 (192)	5,000 (22,240)	1.86 (47)	2.08 (54)	1.02 (26)	1.84 (47)	0.55 (14)	0.99 (25)	2.69 (68)	2.20 (62)
TA 57-24	2,000 (226)	5,000 (22,240)	2.02 (51)	2.25 (57)	1.16 (30)	1.97 (50)	0.55 (14)	1.06 (27)	2.86 (73)	3.10 (88)
TA 62-25	2,500 (283)	5,300 (23,574)	2.11 (54)	2.43 (62)	1.23 (31)	2.08 (53)	0.55 (14)	1.12 (28)	3.05 (78)	3.70 (105)
TA 65-27	3,000 (339)	6,100 (27,133)	2.26 (57)	2.54 (65)	1.30 (33)	2.23 (57)	0.55 (14)	1.19 (30)	3.22 (82)	4.60 (130)
TA 70-29	3,500 (396)	6,600 (29,357)	2.38 (61)	2.70 (69)	1.38 (35)	2.35 (60)	0.56 (14)	1.25 (32)	3.40 (86)	5.10 (145)
TA 72-31	4,000 (452)	7,500 (33,360)	2.54 (65)	2.81 (71)	1.41 (36)	2.46 (63)	0.80 (21)	1.32 (33)	3.58 (91)	6.10 (171)
TA 80-32	5,000 (565)	8,300 (36,918)	2.72 (69)	3.10 (79)	1.57 (40)	2.71 (69)	0.79 (20)	1.45 (37)	3.94 (100)	7.80 (221)
TA 82-35	6,000 (678)	8,700 (38,698)	2.91 (74)	3.22 (82)	1.69 (43)	2.82 (72)	0.81 (21)	1.52 (39)	4.12 (105)	9.10 (258)
TA 85-36	7,000 (791)	9,600 (42,701)	3.00 (76)	3.35 (85)	1.70 (43)	2.95 (75)	0.79 (20)	1.58 (40)	4.30 (109)	10.60 (301)
TA 90-38	8,000 (904)	10,800 (48,038)	3.13 (80)	3.50 (89)	1.75 (45)	3.07 (78)	0.81 (21)	1.65 (42)	4.48 (114)	11.80 (335)
TA 98-40	10,000 (1,130)	14,000 (62,272)	3.37 (86)	3.83 (97)	1.92 (49)	3.34 (85)	0.80 (21)	1.78 (45)	4.83 (123)	14.90 (422)
TA 116-48	17,000 (1,921)	18,000 (82,288)	3.98 (101)	4.56 (116)	2.26 (57)	3.93 (100)	0.80 (21)	2.11 (54)	5.73 (146)	26.10 (740)



**TUBUS TS-Series elastomer bumpers are designed for applications where the energy absorption need not be maximized for the space available.** This results in a significantly lower end load with only slightly longer stroke. These durable bumpers from ACE Controls can be easily mounted to horizontal or vertical surfaces with a single socket head cap screw.

### Technical Data

**Service temperature:** -30° to 150°F (-34° to 65°C)

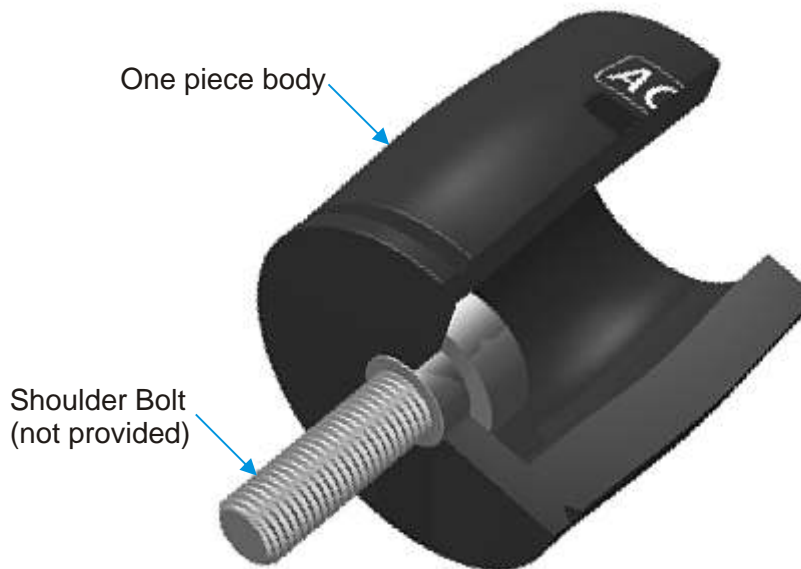
**Energy absorption:** 26 to 56%

**Energy capacity:** 18 to 8,000 in-lbs (2 to 904 Nm)

**Peak dynamic force:** 104 to 5,500 lbs (463 to 24,464 N)

**Elastomer material:** excellent resistance to chemicals, salt water, ultra-violet light and microorganisms. Does not absorb water and will not swell.

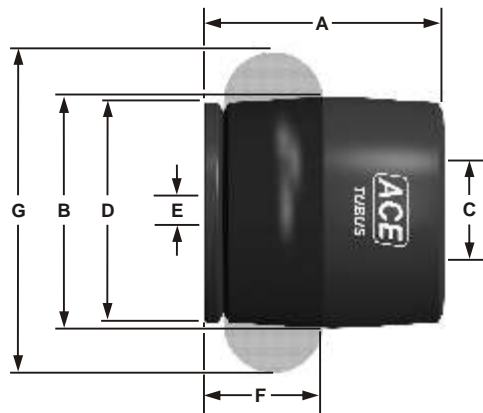
### TUBUS TS-Series Bumpers



### Ordering Information

TS 20-10	
TS-Series	Model Number
TS	14-7 35-19 51-27 68-36 90-47
	18-9 40-19 54-29 75-39 107-56
	20-10 41-21 58-30 78-40
	26-15 44-23 61-32 82-44
	32-16 48-25 64-34 84-43

## Specifications and Dimensions



Model	E3 Energy Capacity in-lbs (Nm)	Peak Dynamic Force lbs (N)	A Free Height in (mm)	B Free Diameter in (mm)	C Wrench Opening in (mm)	D Base Diameter in (mm)	E Mounting Hole in (mm)	F Solid Height in (mm)	G Bulge at Solid Height in (mm)	Shipping Weight oz (g)
TS 14-7	18 (2)	104 (463)	0.58 (15)	0.54 (14)	0.34 (9)	0.51 (13)	0.18 (5)	0.29 (7)	0.76 (19)	0.05 (1)
TS 18-9	33 (3.7)	236 (1,049)	0.74 (19)	0.70 (18)	0.43 (11)	0.65 (17)	0.19 (5)	0.40 (10)	0.96 (24)	0.10 (3)
TS 20-10	50 (6)	300 (1,334)	0.81 (21)	0.79 (20)	0.48 (12)	0.73 (18)	0.31 (8)	0.40 (10)	1.08 (27)	0.14 (4)
TS 26-15	100 (11)	400 (1,779)	1.09 (28)	1.02 (26)	0.63 (16)	0.98 (25)	0.31 (8)	0.53 (13)	1.45 (37)	0.32 (9)
TS 32-16	200 (23)	600 (2,669)	1.27 (32)	1.24 (31)	0.77 (20)	1.18 (30)	0.31 (8)	0.63 (16)	1.72 (44)	0.56 (16)
TS 35-19	250 (28)	700 (3,114)	1.42 (36)	1.38 (35)	0.84 (21)	1.28 (32)	0.31 (8)	0.69 (17)	1.90 (48)	0.77 (22)
TS 40-19	300 (34)	900 (4,003)	1.48 (38)	1.46 (37)	0.82 (21)	1.35 (34)	0.31 (8)	0.73 (18)	1.99 (50)	1.00 (28)
TS 41-21	400 (45)	1,100 (4,893)	1.63 (41)	1.60 (41)	0.93 (24)	1.48 (38)	0.56 (14)	0.79 (20)	2.17 (55)	1.30 (37)
TS 44-23	550 (62)	1,300 (5,782)	1.75 (45)	1.68 (44)	0.98 (25)	1.58 (40)	0.56 (14)	0.86 (22)	2.35 (60)	1.50 (42)
TS 48-25	700 (79)	1,600 (7,119)	1.91 (48)	1.88 (48)	1.09 (28)	1.73 (44)	0.56 (14)	0.92 (23)	2.53 (64)	2.10 (59)
TS 51-27	800 (90)	1,900 (8,451)	2.03 (52)	1.99 (50)	1.12 (28)	1.85 (47)	0.56 (14)	0.99 (25)	2.71 (69)	2.50 (71)
TS 54-29	1,000 (113)	2,000 (8,896)	2.18 (55)	2.11 (54)	1.21 (31)	1.97 (50)	0.55 (14)	1.06 (27)	2.89 (73)	2.80 (79)
TS 58-30	1,200 (136)	2,200 (9,786)	2.33 (59)	2.28 (58)	1.30 (33)	2.09 (53)	0.55 (14)	1.12 (28)	3.07 (78)	3.50 (99)
TS 61-32	1,400 (158)	2,600 (11,565)	2.45 (62)	2.40 (61)	1.39 (35)	2.21 (56)	0.81 (21)	1.19 (30)	3.25 (83)	4.20 (119)
TS 64-34	1,700 (192)	3,000 (13,344)	2.58 (65)	2.53 (64)	1.46 (37)	2.33 (59)	0.81 (21)	1.25 (32)	3.43 (87)	5.00 (142)
TS 68-36	2,000 (226)	3,500 (15,568)	2.71 (69)	2.67 (68)	1.51 (38)	2.47 (63)	0.77 (21)	1.32 (33)	3.61 (92)	5.70 (162)
TS 75-39	2,500 (282)	3,500 (15,568)	2.96 (75)	2.94 (75)	1.70 (43)	2.71 (69)	0.80 (20)	1.45 (37)	3.97 (101)	7.40 (210)
TS 78-40	3,000 (339)	3,700 (16,458)	3.11 (79)	3.05 (77)	1.82 (46)	2.82 (72)	0.81 (21)	1.52 (39)	4.15 (105)	8.50 (241)
TS 82-44	3,500 (395)	4,300 (19,126)	3.31 (84)	3.24 (82)	1.88 (48)	2.95 (75)	0.80 (21)	1.58 (40)	4.33 (110)	9.60 (272)
TS 84-43	4,000 (452)	4,400 (19,571)	3.36 (85)	3.29 (84)	1.97 (50)	3.07 (78)	0.80 (21)	1.65 (42)	4.52 (115)	10.60 (300)
TS 90-47	5,000 (565)	5,300 (23,574)	3.62 (92)	3.55 (90)	2.14 (54)	3.32 (84)	0.80 (21)	1.78 (45)	4.88 (124)	13.80 (391)
TS 107-56	8,000 (904)	5,500 (24,464)	4.31 (109)	4.22 (107)	2.56 (65)	3.95 (100)	0.80 (21)	2.11 (54)	5.78 (147)	21.60 (612)



TUBUS TR-Series elastomer bumpers are designed for applications where a long, soft energy absorption is required. This equates to the minimum end load with the maximum stroke. These proven TUBUS bumpers from ACE Controls can be easily mounted to horizontal or vertical surfaces with a single socket head cap screw.

### Technical Data

**Service temperature:** -30° to 150°F (-34° to 65°C)

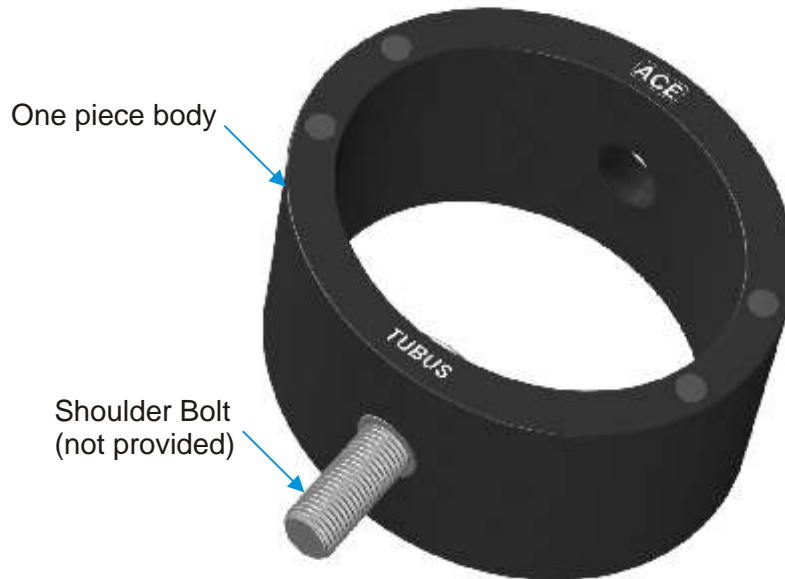
**Energy absorption:** 17 to 35%

**Energy capacity:** 10 to 1,000 in-lbs (1 to 113 Nm)

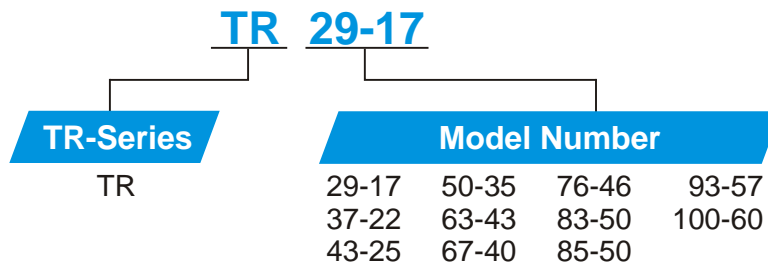
**Peak dynamic force:** 75 to 1,400 lbs (334 to 6,227 N)

**Elastomer material:** excellent resistance to chemicals, salt water, ultra-violet light and microorganisms. Does not absorb water and will not swell.

### TUBUS TR-Series Bumpers

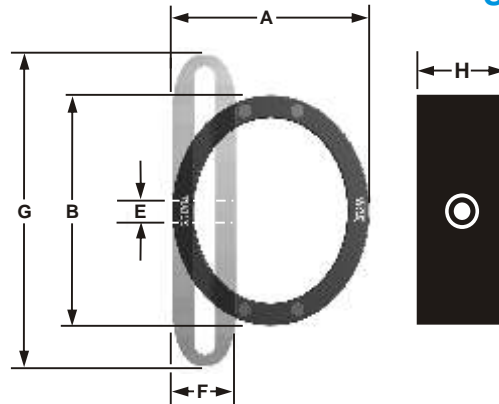


### Ordering Information





## Specifications and Dimensions



Model	E3 Energy Capacity in-lbs (Nm)	Peak Dynamic Force lbs (N)	A Free Height in (mm)	B Free Bulge Diameter in (mm)	E Mounting Hole in (mm)	F Solid Height in (mm)	G Bulge at solid Height in (mm)	H Width	Shipping Weight oz (g)
TR 29-17	10 (1)	75 (334)	0.97 (25)	1.12 (28)	0.22 (6)	0.32 (8)	1.51 (38)	0.52 (13)	0.24 (7)
TR 30-15H	20 (2)	125 (556)	0.91 (23)	1.18 (30)	0.21 (5)	0.32 (8)	1.51 (38)	0.52 (13)	0.16 (5)
TR 37-22	20 (2)	100 (445)	1.25 (32)	1.44 (37)	0.22 (6)	0.41 (10)	1.96 (50)	0.76 (19)	0.48 (14)
TR 39-19H	50 (6)	225 (1,001)	1.17 (30)	1.52 (39)	0.21 (5)	0.41 (10)	1.96 (50)	0.75 (19)	0.47 (14)
TR 43-25	30 (3)	150 (667)	1.47 (37)	1.67 (43)	0.21 (6)	0.48 (12)	2.27 (58)	0.79 (20)	0.60 (17)
TR 45-23H	75 (9)	250 (1,112)	1.40 (36)	1.78 (45)	0.21 (5)	0.48 (12)	2.27 (58)	0.79 (20)	0.63 (18)
TR 50-35	50 (6)	200 (890)	1.72 (44)	1.95 (49)	0.22 (6)	0.37 (9)	2.68 (68)	1.36 (34)	0.90 (25)
TR 52-32H	100 (11)	275 (1,223)	1.64 (42)	2.03 (52)	0.21 (5)	0.37 (9)	2.68 (68)	1.34 (34)	0.80 (23)
TR 63-43	100 (11)	300 (1,334)	2.17 (55)	2.48 (63)	0.22 (6)	0.47 (12)	3.43 (87)	1.70 (43)	1.80 (51)
TR 64-41H	200 (23)	475 (2,113)	2.08 (53)	2.53 (65)	0.22 (6)	0.47 (11)	3.43 (87)	1.70 (43)	1.76 (50)
TR 67-40	200 (23)	475 (2,113)	2.31 (59)	2.61 (66)	0.22 (6)	0.74 (19)	3.47 (88)	1.82 (46)	2.80 (79)
TR 68-37H	550 (62)	1,050 (4,671)	2.20 (56)	2.67 (68)	0.22 (6)	0.74 (19)	3.47 (88)	1.80 (46)	2.71 (77)
TR 76-46	300 (34)	600 (2,669)	2.65 (67)	3.00 (76)	0.28 (7)	0.85 (22)	4.03 (102)	1.80 (46)	3.60 (102)
TR 79-42H	700 (79)	1,300 (5,783)	2.52 (64)	3.12 (79)	0.28 (7)	0.85 (22)	4.03 (102)	1.78 (45)	3.67 (104)
TR 83-50	400 (45)	725 (3,225)	2.88 (73)	3.28 (83)	0.28 (7)	0.92 (23)	4.30 (109)	2.00 (51)	5.30 (150)
TR 85-50	600 (68)	1,000 (4,448)	2.88 (73)	3.33 (85)	0.37 (10)	0.92 (23)	4.37 (111)	2.65 (67)	6.90 (196)
TR 86-45H	1,100 (124)	1,675 (7,451)	2.70 (69)	3.39 (86)	0.27 (7)	0.92 (23)	4.30 (109)	2.00 (51)	5.12 (145)
TR 87-46H	1,400 (158)	2,150 (9,564)	2.68 (68)	3.39 (86)	0.39 (10)	0.92 (23)	4.37 (111)	2.64 (67)	6.71 (191)
TR 93-57	800 (90)	1,250 (5,560)	3.27 (83)	3.67 (93)	0.40 (10)	1.03 (26)	4.87 (124)	3.25 (83)	10.30 (292)
TR 95-50H	2,000 (226)	2,800 (12,455)	3.01 (77)	3.72 (95)	0.37 (9)	1.03 (26)	4.87 (124)	3.21 (82)	9.43 (268)
TR 100-60	1,000 (113)	1,400 (6,227)	3.47 (88)	3.94 (100)	0.40 (10)	1.11 (28)	5.22 (133)	3.20 (81)	11.40 (323)
TR 102-56H	2,500 (283)	3,225 (14,346)	3.30 (84)	4.03 (102)	0.40 (10)	1.11 (28)	5.22 (133)	3.19 (81)	11.19 (318)



**TUBUS TC-Series bumpers are designed for handling crane bumper type applications.** These rugged bumpers meet the minimum requirements for existing industry standards for OSHA and CMAA through the use of a unique “dual-concept” for the device’s spring rate. **They are the proven, cost-effective choice for high-load energy management systems,** and can be mounted with a single socket head cap screw.

### Technical Data

**Service temperature:** -30° to 150°F (-34° to 65°C)

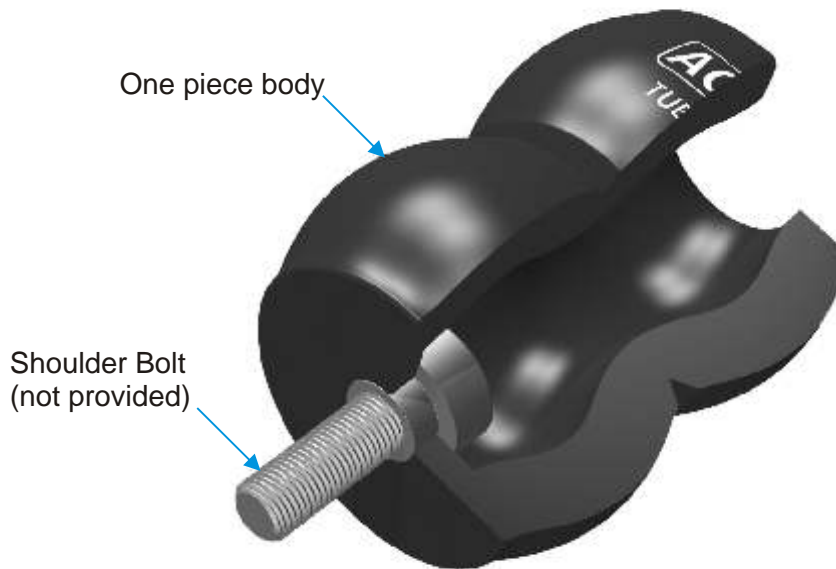
**Energy absorption:** 31 to 63%

**Energy capacity:** 330 to 9,375 ft-lbs (447 to 12,712 Nm)

**Peak dynamic force:** 18,000 to 220,000 lbs (80,064 to 978,560 N)

**Elastomer material:** excellent resistance to chemicals, salt water, ultra-violet light and microorganisms. Does not absorb water and will not swell.

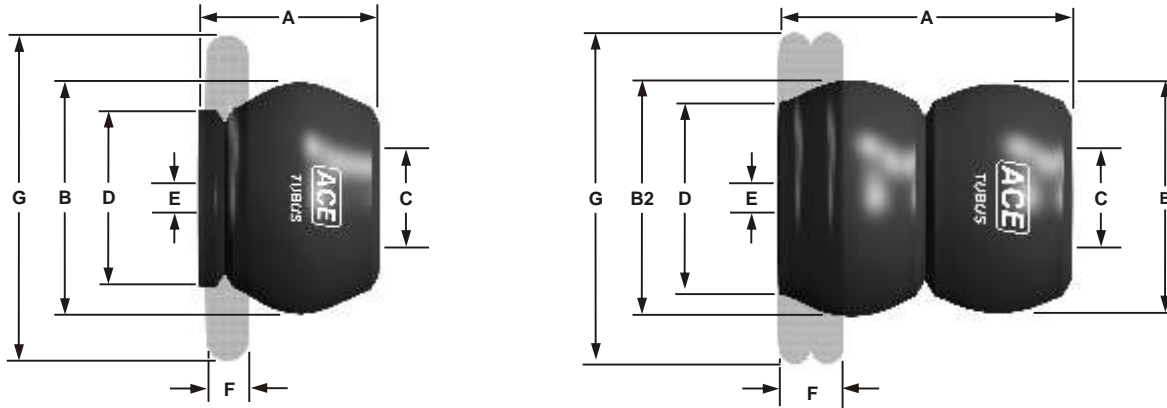
### TUBUS TC-Series Bumpers



### Ordering Information

TC 64-62-S	
TC-Series	Model Number
TC	64-62-S 87-59 117-97 146-67-S
	74-76-S 90-49 134-146-S 150-178-S
	83-73-S 102-63 136-65 153-178-S
	86-39 108-30 137-90 168-124
	176-198-S

## Specifications and Dimensions



Model	E3 Energy Capacity ft-lbs (Nm)	Peak Dynamic Force lbs (N)	A Free Height in (mm)	B Top/Free Bulge Diameter in (mm)	B2 Lower Bulge Diameter in (mm)	C Wrench Opening in (mm)	D Base Diameter in (mm)	E Mounting Hole in (mm)	F Solid Height in (mm)	G Bulge at Solid Height in (mm)
TC 64-62-S	330 (447)	18,000 (80,064)	3.12 (79)	2.43 (62)	2.50 (63)	1.09 (28)	2.04 (52)	0.54 (14)	0.69 (17)	3.50 (89)
TC 74-76-S	720 (976)	37,000 (164,576)	3.76 (96)	2.86 (73)	2.92 (74)	1.29 (33)	2.37 (61)	0.54 (14)	0.80 (20)	4.50 (114)
TC 83-73-S	1,400 (1,898)	82,000 (364,736)	3.72 (93)	3.28 (83)	3.34 (83)	1.45 (37)	2.70 (69)	0.54 (14)	0.80 (20)	5.00 (127)
TC 86-39	890 (1,207)	71,000 (315,808)	2.25 (56)	3.45 (86)	N/A	1.46 (37)	3.09 (78)	0.54 (14)	0.67 (17)	5.25 (133)
TC 87-59	1,300 (147)	57,000 (253,536)	3.32 (84)	3.94 (100)	N/A	1.72 (44)	3.62 (91)	0.54 (14)	1.00 (25)	5.88 (149)
TC 90-49	1,200 (1,627)	112,000 (498,176)	2.67 (68)	3.48 (88)	N/A	1.26 (32)	2.64 (67)	0.54 (14)	0.75 (19)	4.88 (124)
TC 102-63	1,450 (1,966)	50,000 (222,400)	3.85 (98)	4.00 (102)	N/A	1.60 (41)	3.24 (82)	0.80 (20)	1.38 (35)	5.50 (140)
TC 108-30	1,400 (1,898)	102,000 (453,696)	2.09 (53)	4.25 (108)	N/A	1.11 (28)	3.00 (77)	0.55 (14)	0.90 (23)	5.25 (133)
TC 117-97	2,730 (3,702)	110,000 (489,280)	5.08 (129)	4.56 (117)	N/A	1.69 (44)	3.96 (100)	0.80 (20)	1.25 (32)	7.38 (187)
TC 134-146-S	5,375 (7,288)	160,000 (711,680)	7.31 (187)	5.50 (134)	5.50 (134)	2.52 (64)	4.62 (117)	0.80 (20)	1.63 (41)	8.44 (214)
TC 136-65	3,130 (4,244)	112,000 (498,176)	4.18 (106)	5.35 (136)	N/A	1.69 (44)	4.16 (106)	0.80 (20)	1.63 (41)	7.00 (178)
TC 137-90	4,675 (6,339)	205,000 (911,840)	4.50 (115)	5.40 (137)	N/A	1.66 (43)	4.44 (113)	0.80 (20)	1.00 (25)	8.50 (216)
TC 146-67-S	6,140 (8,326)	185,000 (822,880)	4.63 (118)	5.50 (140)	5.75 (146)	1.55 (44)	3.90 (99)	0.79 (20)	2.00 (51)	7.50 (190)
TC 150-178-S	6,530 (8,855)	126,000 (560,448)	9.50 (241)	5.84 (148)	5.88 (149)	2.90 (74)	5.19 (132)	0.80 (20)	2.50 (63)	8.81 (224)
TC 153-178-S	5,350 (7,255)	135,000 (600,480)	8.80 (226)	6.00 (152)	6.00 (152)	2.88 (74)	5.20 (131)	0.80 (20)	1.88 (48)	9.50 (241)
TC 168-124	7,440 (10,089)	220,000 (978,560)	6.54 (166)	6.60 (168)	N/A	2.78 (72)	5.77 (147)	0.80 (20)	1.65 (42)	10.25 (260)
TC 176-198-S	9,375 (12,712)	192,000 (854,016)	9.92 (252)	6.97 (175)	7.00 (176)	3.36 (86)	5.95 (150)	0.80 (20)	2.13 (54)	11.00 (279)

Model	Shipping Weight lbs (g)	Model	Shipping Weight lbs (g)	Model	Shipping Weight lbs (g)
TC 64-62-S	0.35 (159)	TC 102-63	1.13 (512)	TC 146-67-S	3.28 (1,488)
TC 74-76-S	0.52 (236)	TC 108-30	0.78 (354)	TC 150-178-S	5.69 (2,581)
TC 83-73-S	0.62 (281)	TC 117-97	2.21 (1,002)	TC 153-178-S	5.13 (2,327)
TC 86-39	0.56 (254)	TC 134-146-S	3.44 (1,560)	TC 168-124	5.13 (2,327)
TC 87-59	1.13 (512)	TC 136-65	2.38 (1,080)	TC 176-198-S	7.94 (3,602)
TC 90-49	0.56 (254)	TC 137-90	2.38 (1,080)		

# ACE TUBUS® Bumpers Sizing Software



TUBUS Bumpers sizing software from ACE Controls is available to help you **select the proper bumper** for your application. **ACESIZE** sizing software for industrial shock absorbers contains a cross-reference for TUBUS Bumpers and can be easily downloaded from the ACE Controls web site at [www.acecontrols.com](http://www.acecontrols.com).

If preferred, a CD-ROM can be forwarded to you. Distributors to assist you with your application can be easily located on the ACE web site as well.

## Additional Quality Products Available from ACE Controls Inc.



### ⚠ WARNING

IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE PERSONAL OR FATAL INJURY AND/OR PROPERTY DAMAGE.



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Innovation in Deceleration and Motion Control

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