Non-Adjustable Series Hydraulic Shock Absorbers
ECO Series

Overview

ECO Series

RoHS COMPLIANT

ITT Enidine's **New ECO Series** non-adjustable hydraulic shock absorbers can accommodate varying energy conditions. This family of tamperproof shock absorbers provides consistent performance, cycle after cycle. Non-adjustable models are designed to absorb maximum energy within a compact envelope size.

The **ECO Series** was designed using materials and fluids that are safe for our environment. Models can accommodate a wide range of operating conditions with varying masses or propelling forces. The **ECO Series** offers a flexible design to accomodate a wide variety of application parameters. Whether your application has a low velocity/high drive force or high velocity/low drive force condition, the **New ECO Series** will deliver the performance that you have come to expect.

Features and Benefits

- **Extensive non-adjustable product line** offers flexibility in both size and energy absorption capacity to fulfill a wide range of application requirements.
- **Environmentally friendly materials:**
  - RoHS Compliant materials
  - Bio-degradable hydraulic oil
  - Copper-Free design
  - Recyclable packaging materials
- **Introducing our new Enicote II surface finish:**
  - RoHS Compliant
  - Rated at 350 hours salt spray corrosion protection
- **Jam Nut included** with every shock absorber.
- **ISO quality standards** result in reliable, long-life operation.
- **Tamperproof design** ensures repeatable performance.
- **Threaded cylinders provide mounting flexibility** and increase surface area for improved heat dissipation.
- **Wrench flats** promote ease of mounting
- **Capability to mount into pressure chambers**
- **Integrated positive stopping capabilities** up to 100 psi (7 bar).
- **Special materials and finishes** can be designed to meet specific customer requirements
  - Optional fluids and seal packages can expand the standard operating temperature range from (15°F to 180°F) to (–30°F to 210°F)
  - Food grade options available
- **Custom orificed (CBECO)** can be engineered to meet specific application requirements or emergency impact only requirements.

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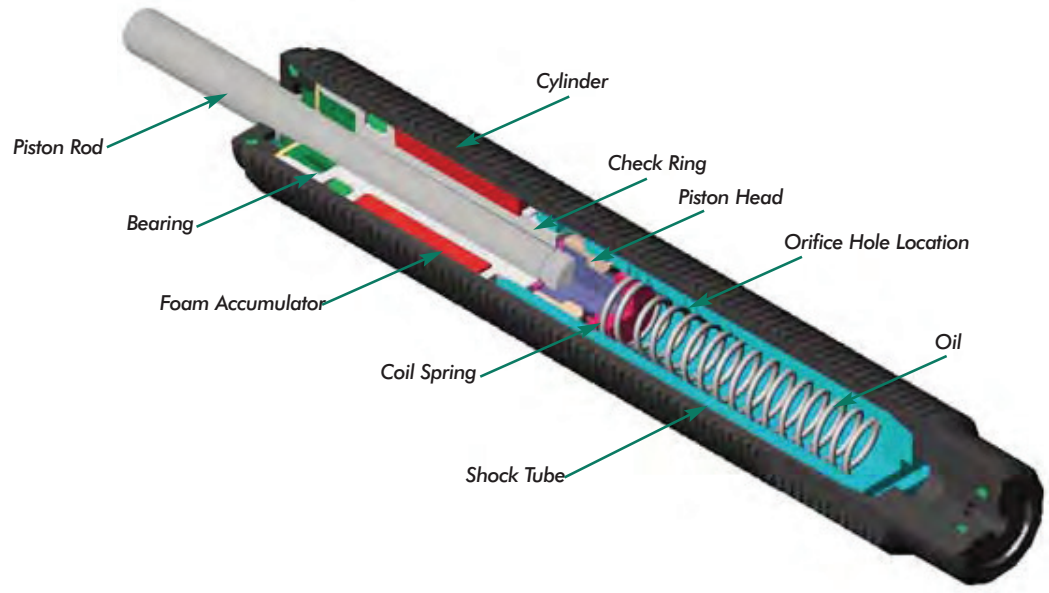
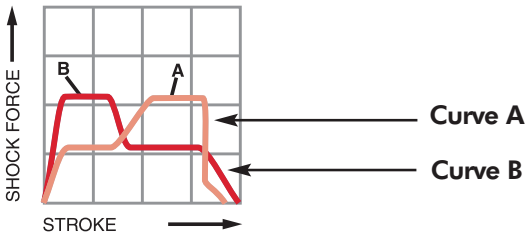
ITT Enidine Non-Adjustable Multiple Orifice Shock Absorbers





Self-compensating damping maintains acceptable deceleration with conventional type damping characteristics. Self-compensating shock absorbers operate over a wide range of weights and velocities. These shock absorbers are well suited for high drive force, low velocity applications, and where energy conditions may change. **Curve A** shows the *shock force vs. stroke* curve of a self-compensating shock absorber impacted with a low velocity and high drive force. **Curve B** shows the *shock force vs. stroke* curve of a self-compensating shock absorber impacted with a high velocity and low drive force.

The design of a multi-orifice shock absorber features a double cylinder arrangement with space between the concentric shock tube and cylinder, and a series of orifice holes drilled down the length of the shock tube wall.

During piston movement, the check ring is seated and oil is forced through the orifices in the shock tube wall, into the closed cellular foam accumulator and behind the piston head.

As the piston head moves it closes off orifice holes, thus reducing the available orifice area in proportion to the velocity. After the load is removed the coil spring pushes the piston rod outward. This unseats the check ring and permits the oil to flow from the accumulator and across the piston head, back into the shock tube. This allows quick repositioning for the next impact.

Low Pressure multiple orifice shock absorbers can provide progressive or self-compensating damping, depending on the impact conditions.

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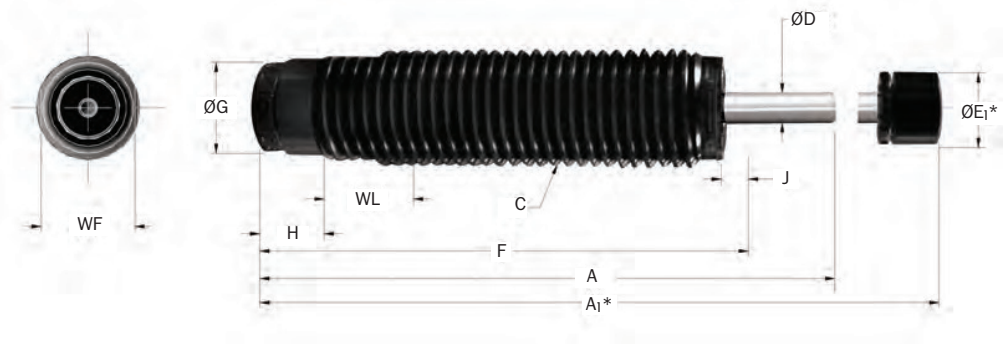
Technical Data

Standard
ECO 8 → ECO 100 Series



*Note: A_1 and E_1 apply to button models and urethane striker cap accessory. One Hex Jam Nut included with every shock absorber.

Catalog No./ Model	(S) Stroke in. (mm)	(E_T) Max. in.-lbs./cycle (Nm/cycle)	(E_TE) Emergency Max. in.-lbs./cyde (Nm/cycle)	(E_TC) Max. in.-lbs./hour (Nm/h)	(F_P) Max. Reaction Force lbs. (N)	Nominal Coil Spring Force		(F_D) Max. Propelling Force lbs. (N)	Model Weight oz. (g)
						Extended lbs. (N)	Compressed lbs. (N)		
ECO 8 (B)	0.25 (6,4)	35 (4,0)	– –	55,000 (6 215)	200 (890)	0.6 (2,7)	1.2 (5,6)	45 (200)	.5 (16)
ECO 10 (B)	0.28 (7,0)	62 (7,0)	– –	120,700 (13 640)	360 (1 600)	0.5 (2,2)	1.0 (4,5)	80 (350)	1.0 (28)
ECO 15 (B)	0.41 (10,4)	106 (12,0)	220 (25)	275,000 (31 020)	450 (2 000)	0.7 (3,0)	1.6 (7,0)	50 (220)	2.0 (56)
ECO S 25 (B)	0.50 (12,7)	212 (24,0)	390 (44)	331,000 (37 400)	625 (2 800)	1.0 (4,5)	2.5 (11,0)	200 (890)	2.4 (68)
ECO 25 (B)	0.63 (16,0)	265 (30,0)	500 (56)	389,000 (44 000)	625 (2 800)	1.0 (4,5)	2.5 (11,0)	200 (890)	2.4 (68)
ECO S 50 (B)	0.50 (12,7)	285 (32,0)	560 (63)	440,000 (49 720)	850 (3 750)	1.5 (6,0)	3.5 (15,0)	360 (1 600)	4.0 (123)
ECO 50 (B)	0.88 (22,0)	550 (62,0)	975 (110)	523,000 (59 070)	850 (3 750)	2.0 (8,9)	6.8 (30,0)	360 (1 600)	4.8 (136)
ECO 100 (B)	1.00 (25,0)	930 (105,0)	2210 (250)	681,500 (77 000)	1,250 (5 500)	3.0 (13,0)	6.0 (27,0)	500 (2 200)	10.5 (297)

*Notes: Maximum energy rating for emergency use only. Estimated cycle life of 1-5 cycles if used at maximum emergency rating.

Catalog No./ Model	Damping Constant	A in. (mm)	A_1 in. (mm)	C in. (mm)	D in. (mm)	E_1 in. (mm)	F in. (mm)	G in. (mm)	H in. (mm)	J in. (mm)	WF in. (mm)	WL in. (mm)
ECO 8 IF (B) ECO 8 MF (B) ECO 8 MC (B)	-1,-2,-3 -1,-2,-3 -1,-2,-3	1.86 (47,0)	2.25 (57,0)	3/8 - 32 UNEF M8 x 0,75 M8 x 1,0	.10 (2,5)	0.27 (6,8)	1.61 (40,9)	.26 (6,6)	.18 (4,6)	.10 (2,5)	– –	– –
ECO 10 IF (B) ECO 10 MF (B)	-1,-2,-3 -1,-2,-3	2.12 (54,0)	2.51 (64,0)	7/16 - 28 UNEF M10 x 1,0	.12 (3,0)	0.34 (8,6)	1.83 (46,5)	.34 (8,6)	.18 (4,6)	.13 (3,3)	– –	– –
ECO 15 IF (B) ECO 15 MF(B) ECO 15 IC (B)	-1,-2,-3,-4 -1,-2,-3,-4 -1,-2,-3,-4	2.45 (62,2)	2.85 (72,4)	7/16 - 28 UNEF M12 x 1,0 1/2 - 20 UNEF	.12 (3,0)	.40 (10,2)	2.10 (52,1)	.39 (9,9)	.27 (6,9)	.10 (2,5)	.39 (11,0)	.38 (9,5)
ECO S 25 MF (B) ECO S 25 IC (B) ECO S 25 MC (B)	-1,-2,-3 -1,-2,-3 -1,-2,-3	3.25 (82,7)	3.63 (92,2)	M14 x 1,0 9/16 - 18 UNF M14 x 1,5	.16 (4,0)	0.44 (11,2)	2.74 (69,5)	.43 (10,9)	.20 (5,1)	.04 (1,0)	(12,0) .50	.50 (12,7) (12,0)
ECO 25 IF (B) ECO 25 MF (B) ECO 25 IC (B) ECO 25 MC (B)	-1,-2,-3,-4 -1,-2,-3,-4 -1,-2,-3,-4 -1,-2,-3,-4	3.84 (97,5)	4.22 (107,2)	1/2 - 20 UNF M14 x 1,0 9/16 - 18 UNF M14 x 1,5	.16 (4,0)	.44 (11,2)	3.20 (81,3)	.43 (10,9)	.30 (7,6)	.04 (1,0)	(12,0) .50	.44 .50 (12,7) (12,0)
ECO S 50 IF (B) ECO S 50 MC (B)	-1,-2,-3 -1,-2,-3	3.46 (87,9)	3.93 (99,9)	3/4 - 16 UNF M20 x 1,5	.19 (4,8)	0.50 (12,7)	2.93 (74,4)	.64 (16,3)	.30 (7,6)	.04 (1,0)	.68 (18,0)	.50 (12,7)
ECO 50 IF (B) ECO 50 MC (B)	-1,-2,-3,-4 -1,-2,-3,-4	4.66 (118,4)	5.13 (130,3)	3/4 - 16 UNF M20 x 1,5	.19 (4,8)	0.50 (12,7)	3.76 (95,5)	.64 (16,3)	.30 (7,6)	.04 (1,0)	.68 (18,0)	.50 (12,7)
ECO 100 IF (B) ECO 100 MF (B) ECO 100 MC (B)	-1,-2,-3,-4 -1,-2,-3,-4 -1,-2,-3,-4	5.07 (128,8)	5.57 (141,5)	1-12 UNF M25 x 1,5 M27 x 3,0	.25 (6,4)	0.62 (15,7)	4.04 (102,6)	.87 (22,0)	.50 (12,7)	.18 (4,6)	.88 (23,0)	.50 (12,7)

Notes: 1. See page 54 for constant damping curves.