

世界上最小、最轻的HEV用 扭矩限制减震器 (TLD)

The world's smallest and lightest torque limiter damper (TLD) for HEV

e-WAD e-Unity

EXEDY

量产中 · 开发中
In Mass Production / Under Development

特点

Features

构造

Structure

- 通过减小骨架的直径并将其与飞轮的形状相结合，实现轻量化和低成本化。
Achieves weight reduction and cost reduction by reducing the diameter of the skeleton and combining it with the shape of the flywheel

减震器

Damper

- 设置与直列 3 缸和直列 4 缸发动机兼容的 e-WAD 和 e-Unity
Set e-WAD and e-Unity compatible with in-line 3-cylinder and in-line 4-cylinder engines
- 多功能 AC/DC 可变阻尼机构，可实现共振抑制和燃油效率的提高
Multi-function AC / DC hysterical mechanism achieves both resonance suppression and fuel efficiency improvement

限制器

Limiter

- 以高热容限制器结构实现可靠的动力传输和系统保护
High heat capacity limiter structure realizes reliable power transmission and system protection

生产性

Productivity

- 实现多个母子共冲部件
Achieves parent-child taking of multiple parts

参考展示

Reference exhibition



e-WAD 正负不对称 AC/DC
e-WAD Positive / negative asymmetry AC/DC



e-Unity · F/W 一体型
e-Unity with integrated flywheel

世界上最小、最轻的HEV用 扭矩限制减震器 (TLD)

The world's smallest and lightest torque limiter damper (TLD) for HEV

e-WAD e-Unity

EXEDY

量产中 · 开发中
In Mass Production / Under Development

构造

Structure

更小的骨架直径和飞轮惯性的重新分配

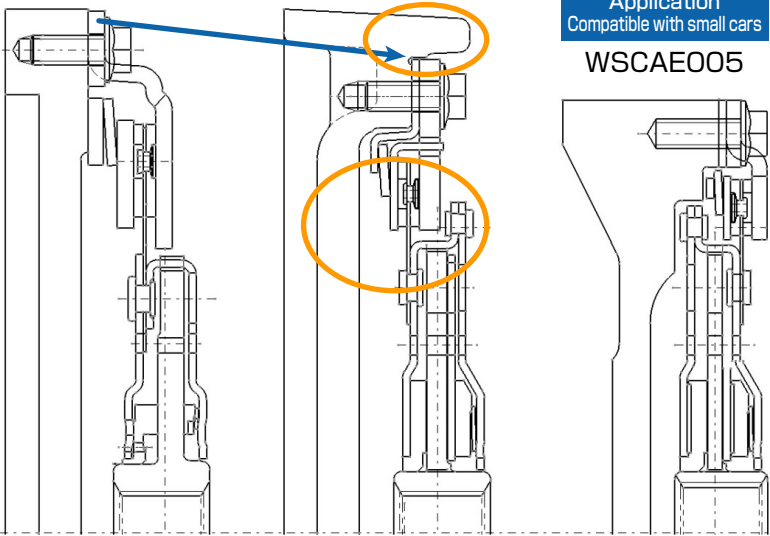
Smaller skeleton diameter and redistribution of flywheel inertia

常规产品
Conventional product

开发产品
Development product

应用
兼容小型车
Application
Compatible with small cars

WSCAE005



通过设计使减震器部件紧固连结的方法，使限制器在轴方向重叠来缩小外径，以飞轮的外径尺寸轴向化来弥补惯性量的不足，从而实现了轻量化和低成本化。

By devising the fastening method of the damper parts, the outer diameter is reduced by overlapping the limiter and the axial direction. The shortage of inertia is covered by the outer diameter and axial dimensions of the flywheel, achieving both weight reduction and cost reduction.

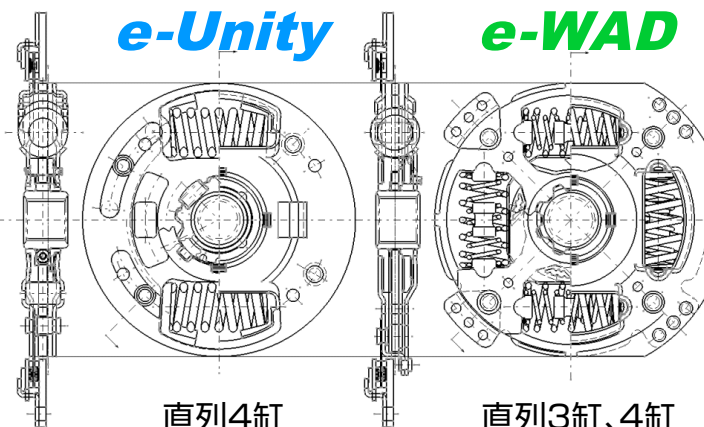
	常规产品 Conventional product	开发产品 Development product
TLD	4.4kg	3.5kg
F/W	6.5kg	7.2kg
总重量 Total	10.9kg	10.7kg

减震器

Damper

有两种广角低刚性类型的减震器可供选择

Two types of wide-angle and low-rigidity damper bodies are available.

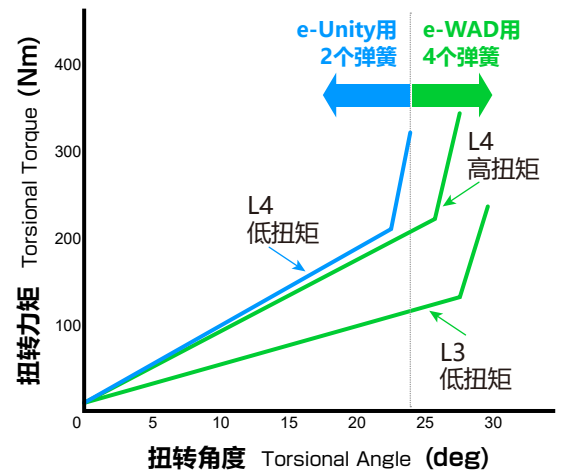


直列4缸
中等扭矩

In-line 4-cylinder
Medium torque

直列3缸、4缸
高扭矩

In-line 3-cylinder, 4-cylinder
High torque



世界上最小、最轻的HEV用 扭矩限制减震器 (TLD)

The world's smallest and lightest torque limiter damper (TLD) for HEV

e-WAD e-Unity

EXEDY

量产中・开发中
In Mass Production / Under Development

减震器

Damper

多功能AC/DC可变阻尼机构

Multi-function AC / DC hysteresis mechanism

- 通过不同的摩擦片形状实现 4 种特性 (类型 1-4)

Achieves 4 types of characteristics with different friction plate shapes (Types 1 to 4)

- 改进 HEV 系统 (串并联、串联、直接串联) 的兼容性、从而抑制共振和提高燃油效率

Improved compatibility of HEV systems (series parallel, series, series with direct connection), resonance suppression and improved fuel efficiency

扭矩特性不同导致的兼容性差异的比较

Comparison of compatible affinity due to difference in twist characteristics

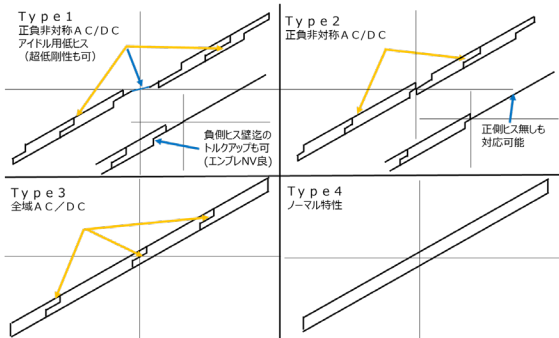
开发阶段	種類	特性	フリクションプレート形状	始動	停止	発電走行	放電	発電→アイドル	放電→アイドル	アイドル
開発中	Type1	正負非対称 AC/DC & 低ヒス アイドル超低剛性		◎	○	◎	◎	◎	◎	◎
開発中	Type2	正負非対称 AC/DC 正側AC有り		◎	◎	◎	◎	△	○	○
開発中	Type3	正負非対称 AC/DC 正側ヒス無し		○	◎	◎	◎	△	△	○
開発中	Type3	全城AC/DC		○	◎	◎	◎	△	△	○
量产中	Type4	ノーマル特性	—	◎	◎	◎	◎	△	△	△

◎: 兼容性好 ○: 需要符合 △: 影响油耗, 需要符合

带预倾卸器

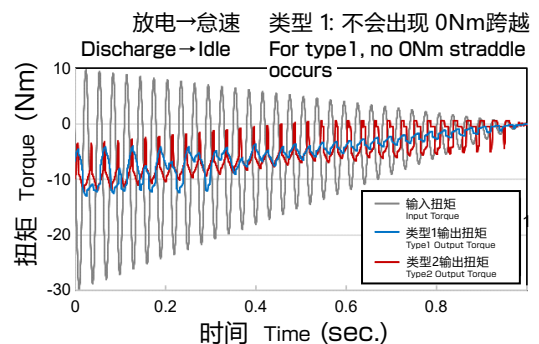
扭矩特性

Characteristics of twisting characteristics



仿真模拟结果: 放电→怠速

Simulation result: Discharge → Idle

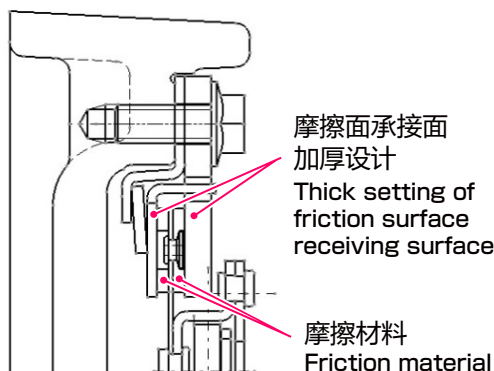


限制器

Limiter

摩擦面承接面的加厚设计实现了长寿命和稳定的特性

Thick friction surface receiving surface, Achieves long life and stable characteristics



生产性

Productivity

通过多个母子共冲部件和连续冲压化提高生产效率

(母子共冲部件如下图中同色部分所示)

Improve productivity by parent-child taking of multiple parts and progressive press (Parent and child parts of the same color in the figure below)

