

**ECO CLOVER**



**IHI**



When a turbocharger meets a car,  
an ecological story takes off.

涡轮增压器与汽车的邂逅。  
环保的故事已经启程。



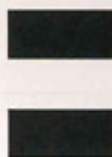


**ECO CLOVER**

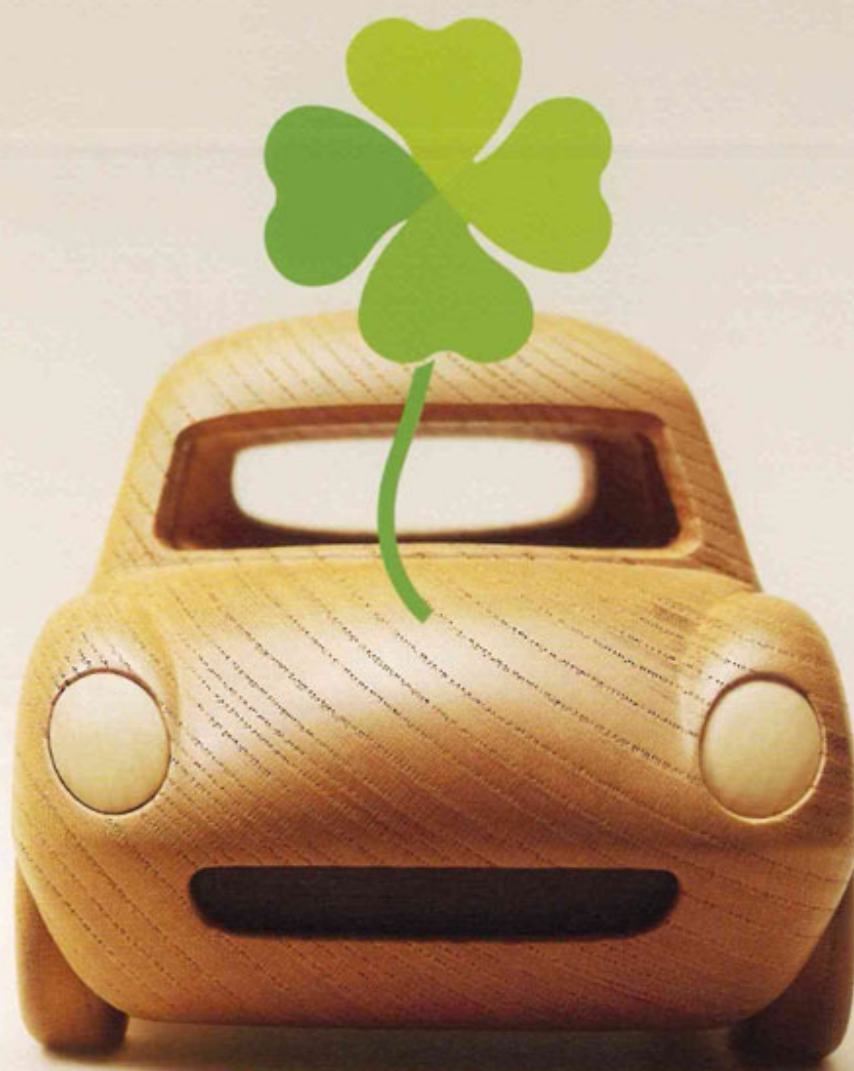




**CAR**







**ECO-CAR**



**Less fuel / 低油耗**

**Downsizing / 小型化**

**20% + 30%**

A turbocharged 1.4 - 1.6L engine, when compared with a non-turbo 2.0L engine of similar power or torque, has approximately 20% better fuel efficiency. As a result, CO2 emissions can also be reduced.

将搭载扭矩或相同等级马力、排气量为1.4-1.6L涡轮增压器的发动机，与不搭载涡轮增压器、排气量为2.0L的发动机相比，前者大约可节省20%的油耗。其结果，便是可削减CO2排放量。

\* The figures above are based on our in-house survey of American and European car manufacturers' catalog specifications publicized as of October, 2011.

\* Vehicle specifications may change according to the date of sales, thus customers may not be able to purchase a vehicle with the specifications described above.

\* Fuel efficiency measurement standards vary in different regions (countries). The figures above are calculated according to the metrics of the region (country) the surveyed vehicles are sold in.

\* The figures above do not intend to promote the sales of vehicles using our products but are merely an indication of the technology level of the market.

※以上数字来源于本公司在2011年10月，调查欧美汽车制造商产品目录规格时的结果。汽车的销售根据上市时间有所不同。如今已有可能无法购入与上述车辆规格相同的汽车。

※油耗测定标准根据地区（国家）有所不同。以上数字是依据调查车辆上市地区（国家）的测定标准计算得出。

※本公司列举以上数字，目的并不在于对旗下产品进行促销，而是以此说明市场的技术水平。



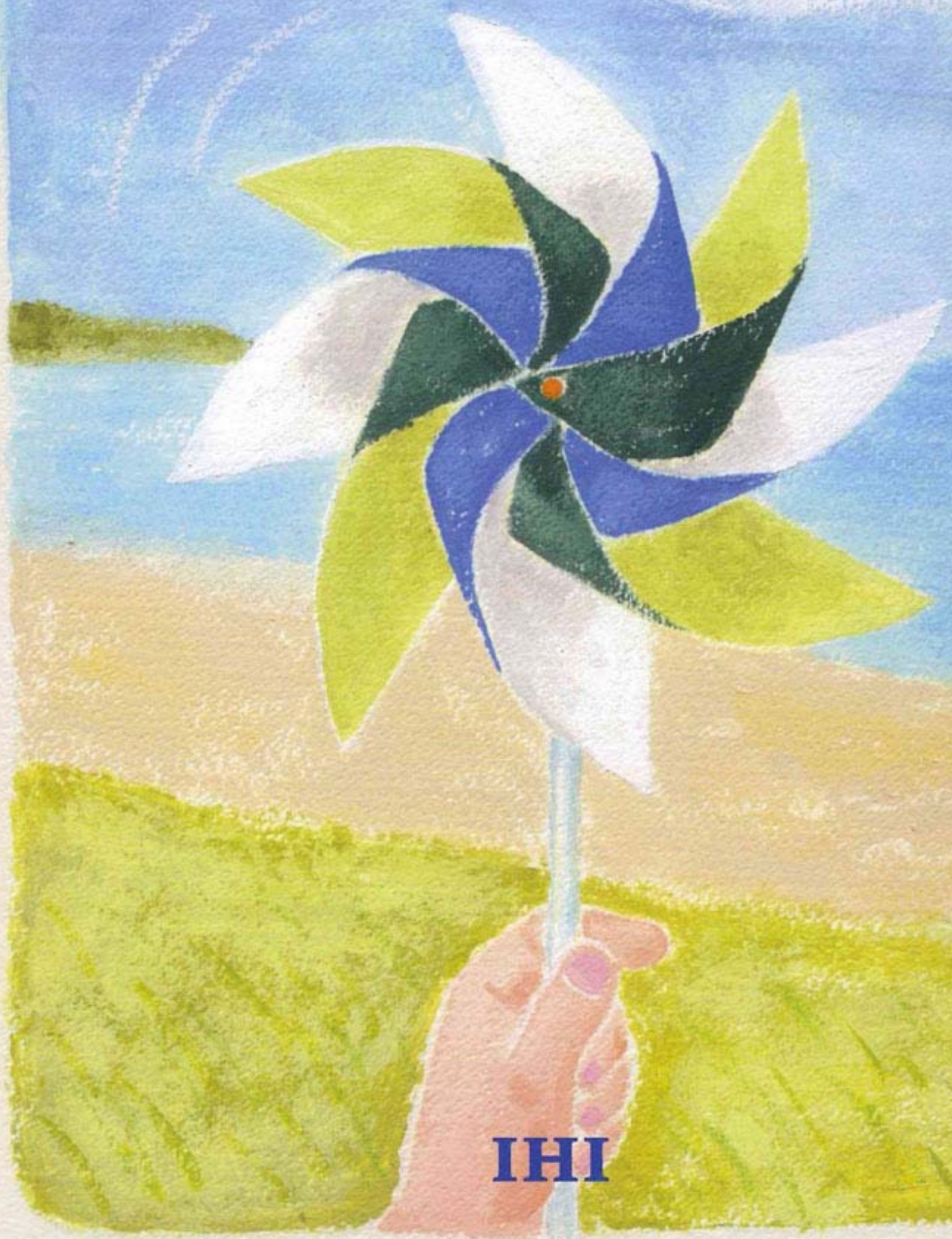






**「かざぐるま」が先生でした。**

A pinwheel was our teacher.



**IHI**



# 「かざぐるま」が 教えてくれたこと。

What a pinwheel teaches us.



小さな力で勢いよく回転する  
「かざぐるま」をヒントに  
「ターボチャージャー」が生まれました。

A turbocharger was conceived from a pinwheel which spins rapidly with little effort.



この「ターボチャージャー」を  
装着すると エンジンの働きをたすけ、  
「4つのいいこと」につながるのです。

This turbocharger helps  
the engine, resulting in 4 benefits.

いいこと  
1

低燃費

Advantage 1  
Better mileage

いいこと  
2

排ガスが  
クリーンに

Advantage 2  
Cleaner exhaust

いいこと  
3

エネルギー  
回収

Advantage 3  
Energy recovery

いいこと  
4

低回転でも  
走りやすい

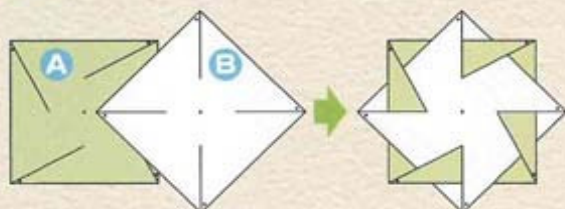
Advantage 4  
Easier driving at  
low rpm

「4つのいいこと」で  
エコなクルマになりました。

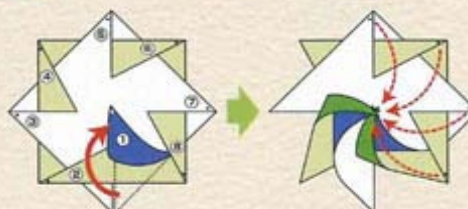
The 4 advantages made me an ecological car.

## 「かざぐるま」の作り方 ✂ How to make a pinwheel

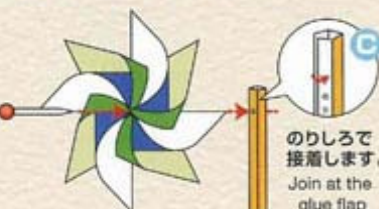
1 Bを上にして図のように重ねます。



2 穴が中心と重なるように  
①から⑧まで順番に曲げます。



3 待ち針<sup>※</sup>や、はりがねを使い  
Cに合体させて完成です。



※待ち針をご使用の際は、針の先を折るなどして安全な処置をお願いします。 ※棒は割りばしや、ストローでも代用できます。

1. Place B on top of A as shown. 2. Bend the fins from 1 to 8 so that their holes align with the center hole. 3. Use a dressing pin\* or a piece of wire to attach it to C.

\* When using a dressing pin, please bend the tip for safety. \* The stick can be substituted with a drinking straw or chopsticks.



みんな

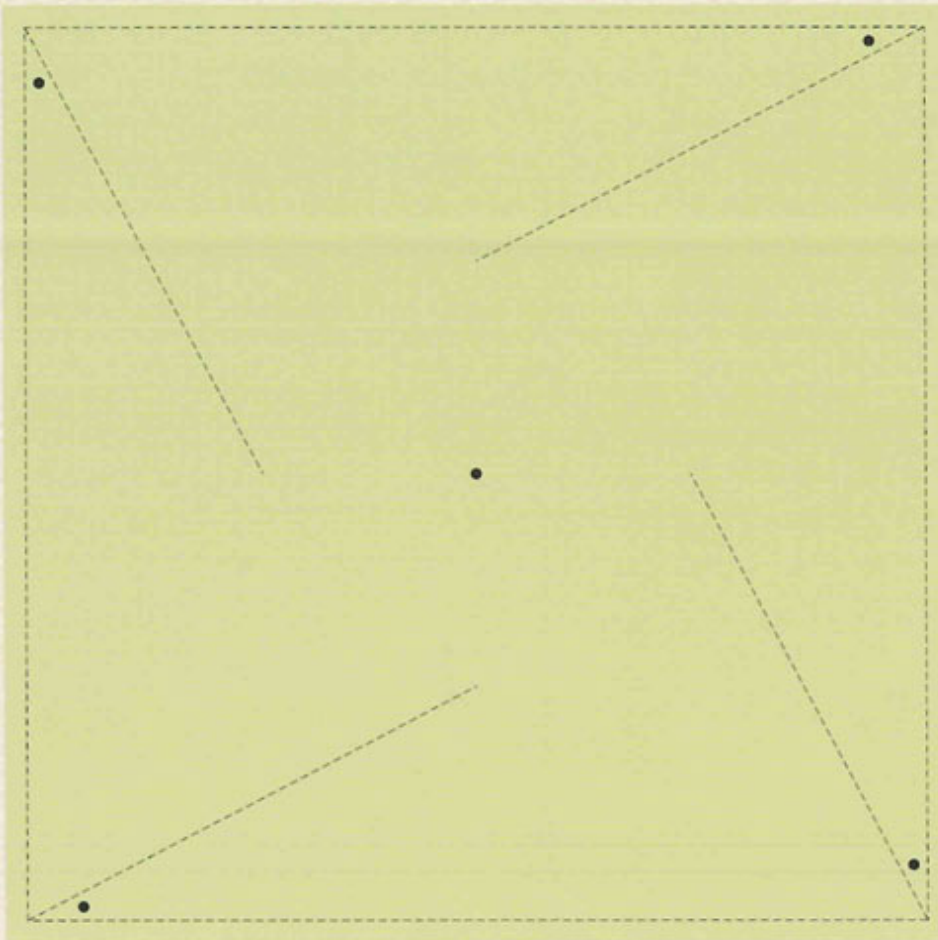
# かざぐるまを作ってみよう!

実際に作ってみると、「かざぐるま」の回転パワーがよくわかるよ。

Let's make a pinwheel! You can see the rotating power of a pinwheel by making one yourself.



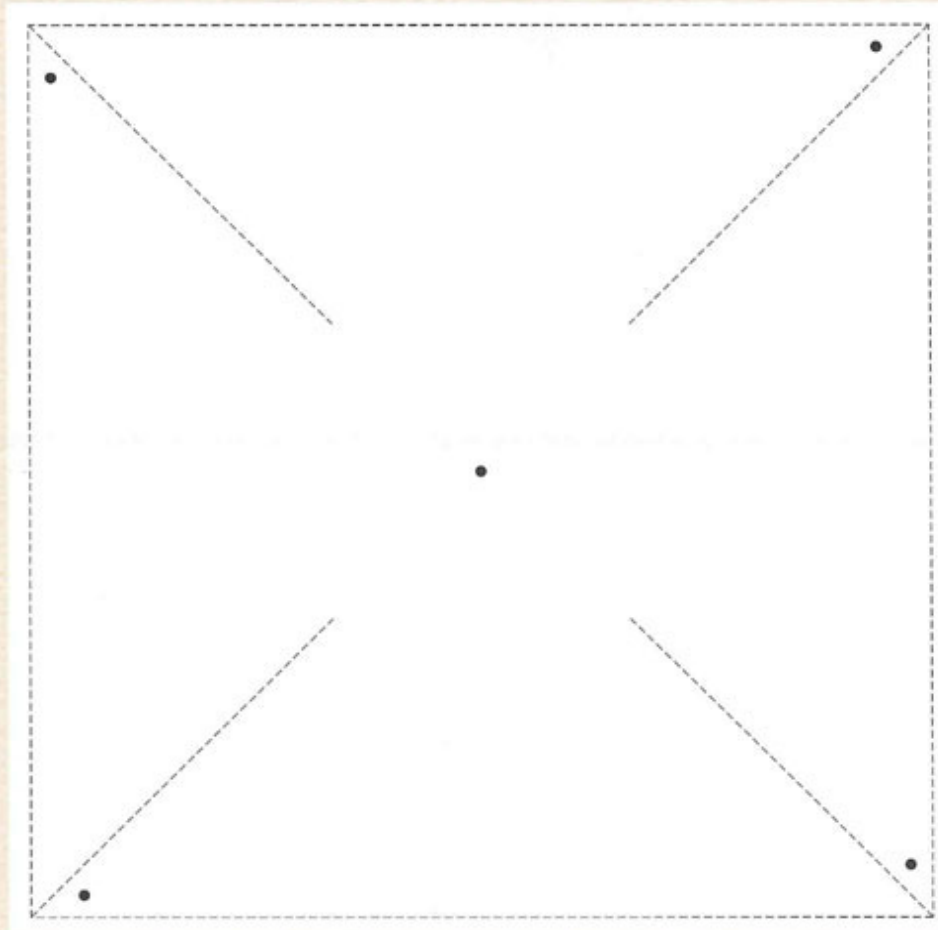
A



C



B



--- ✂ キリトリ Cut

----- 谷折り Valley fold

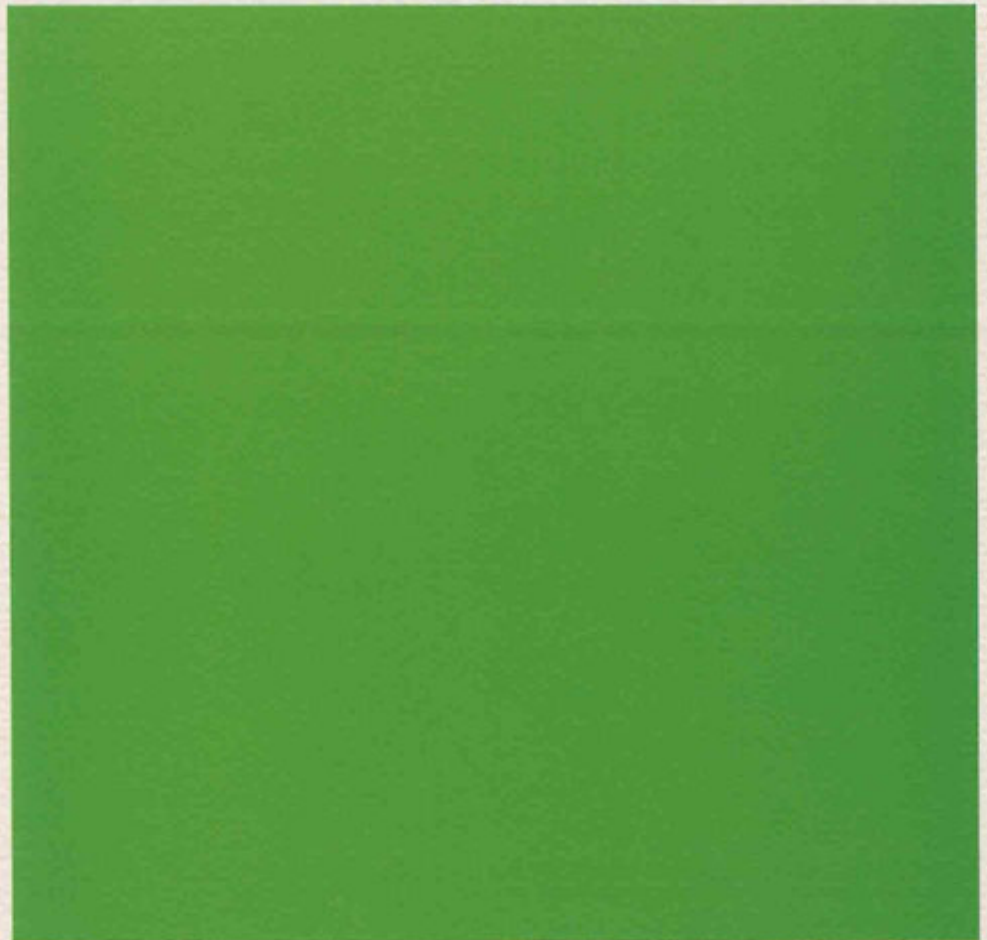
● 穴をあける Hole

- 「かざぐるまの作り方」のページをよく確認し作りましょう。
- お子様がはさみやカッター等を使用する場合は、安全のため、必ず保護者の方が付き添ってください。
- Read the [How to make a pinwheel] page carefully.
- Always have children use scissors and craft knives under adult supervision.

の  
り  
Give flap

の  
り  
Give flap

の  
り  
Give flap





**Cleaner exhaust** / 尾气洁净

# 90%

The amount of particulate matters (PM: the black exhaust) released from turbocharged diesel engines have been reduced to 1/10 in the past decade. Turbochargers are widely used in diesel engines to reduce PM emission.

过去10年中，搭载涡轮增压器的柴油发动机排出的PM（微粒状物质、即黑色煤烟）已被削减至1/10。为减少PM的排放，涡轮增压器已得到使用柴油发动机车辆的广泛采用。



## Energy recovery / 能源回收效果

# 10%

The exhaust gas emitted from an engine is hot and pressurized. Therefore, it contains energy that is lost through the exhaust. Turbocharged vehicles use this exhaust gas to drive the turbine, recovering 10% of the energy being lost.

由汽车发动机排出的尾气在高温高压状态下，  
将能量排出车外。

而搭载涡轮增压器的车辆，  
可利用排出的尾气驱动涡轮增压器的涡轮，  
有效回收10%的能量。











**Drivability, Better low-end torque / 驾驶舒适便捷·低转速高扭矩**

# 1500<sub>rpm</sub>

Generally, a non-turbo engine must rev above 4000rpm to achieve maximum torque, however, turbocharged engines can achieve maximum torque from approximately 1500rpm.

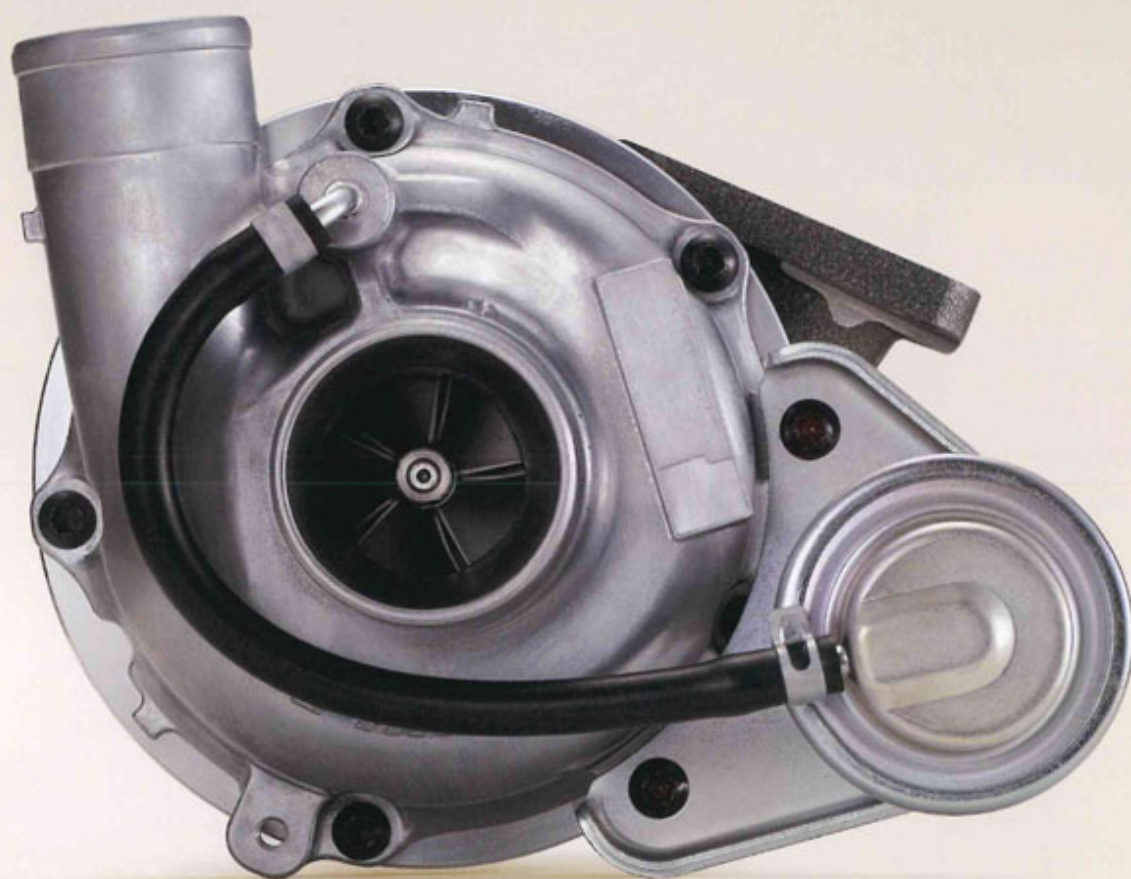
This allows the driver to drive comfortably with light touches of the accelerator and also with less revving of the engine.

一般不搭载涡轮增压器的发动机为达到最大扭矩，  
需要通过踩踏油门令发动机转速达到4000转以上。  
而搭载了涡轮增压器的发动机，  
只需令发动机达到1500转以上便可发挥最大扭矩。  
因此只需轻踩油门便可轻松驾驶车辆，  
并且无需大幅加快发动机的转速。



**ECO CLOVER**





**TURBOCHARGER**

## [ Overseas Offices / 海外公司 ]

Turbocharged cars are becoming more popular around the world.

We will continue to contribute to environment as we move forward.

搭载涡轮增压器发动机的汽车在世界范围内越来越普及。今后亦会在为环保做出贡献的同时，不断开创未来。



① IHI Corporation Head Office.



② IHI Turbo Co., Ltd.



③ IHI Turbo America



④ IHI Charging Systems International GmbH



⑤ IHI Charging Systems International Germany GmbH



⑥ IHI Charging Systems International S.p.A.



⑦ IHI TURBO (THAILAND) Co., Ltd.



⑧ Changchun FAWER-IHI Turbo Co., Ltd.



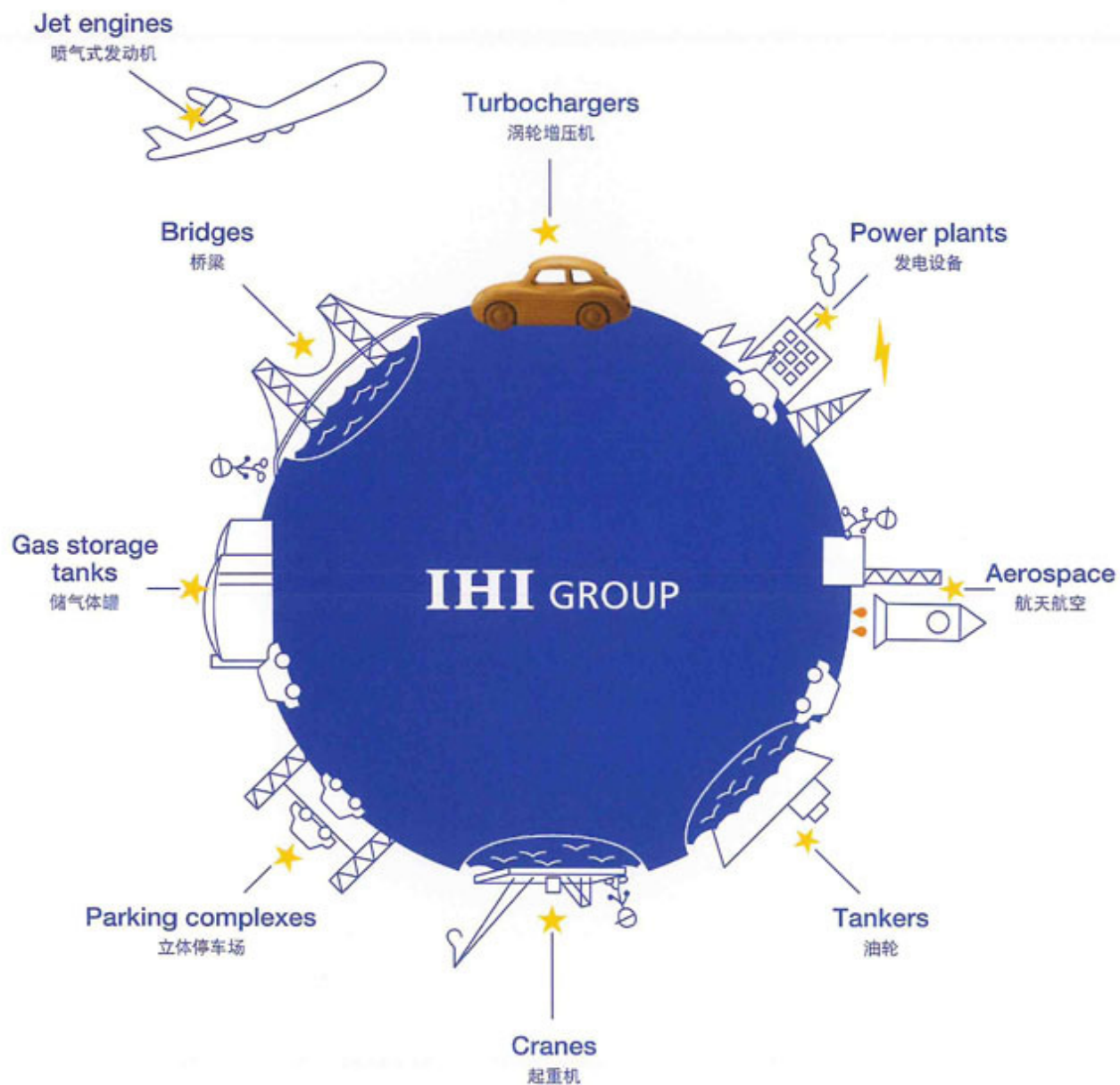
⑨ Wuxi IHI Turbo Co., Ltd.





## A partner of your life, IHI Group

在日常生活中，IHI集团是您的伙伴。



The IHI Group is working in fields from solutions for daily life  
to the land, ocean, and aerospace.

IHI集团的业务领域，正从贡献于日常生活的各种产品，向陆地、海洋、天空、宇宙无限延伸。

# IHI



Please see the short movie version of the ECO CLOVER too.

请观赏“ECO CLOVER”的微电影版本。

<http://www.ihi.co.jp/sp/turbo/>

