

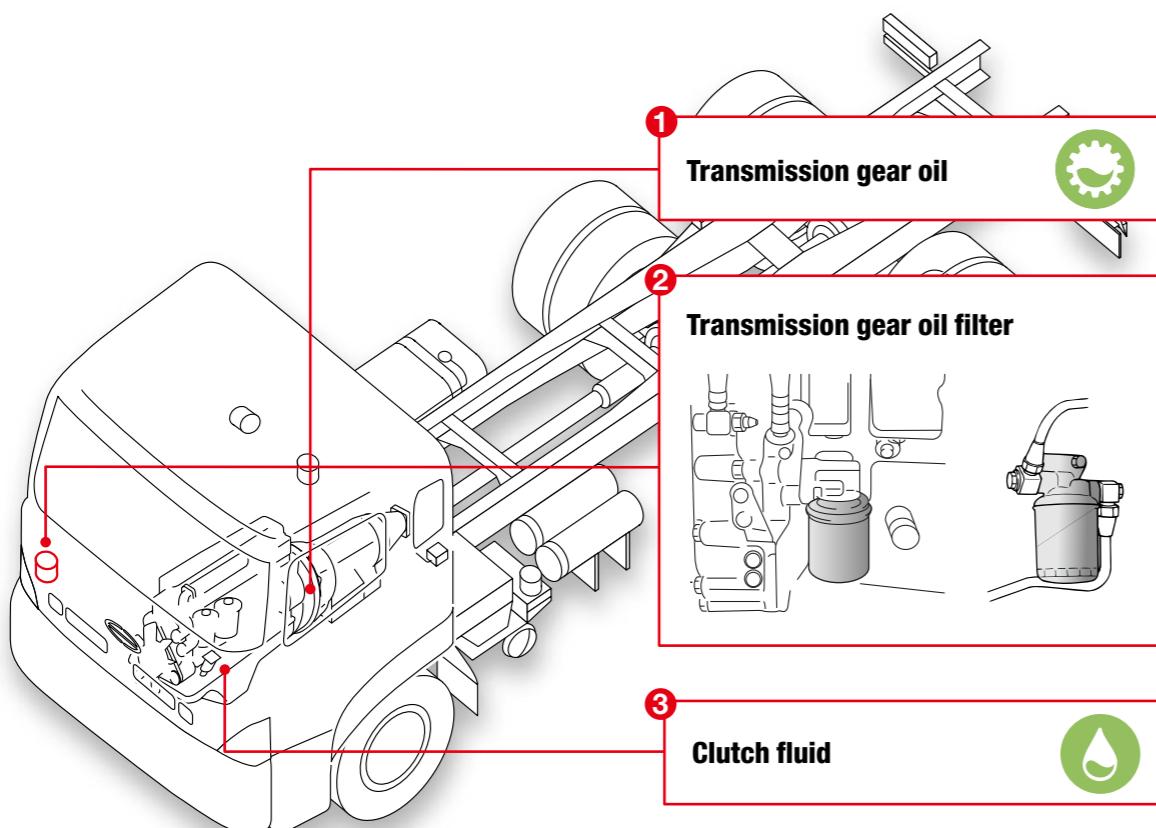
# Understanding Maintenance

## Transmission and clutch parts that require periodic replacements.

To contribute to safety, reduction of problems on the road and reduction of repair costs, we at Hino urge our customers to perform daily inspections, as well as bring their trucks in for periodic inspections as a preventative maintenance step. In the previous issue (014), we used the HINO 700 Series as our example to outline the key brake components that must be replaced during periodic inspections. In this issue, we would like to discuss transmission and clutch components and oils that require periodic replacements. We will also be giving you a simple overview of the potential problems that could occur in the case of failure to carry out these replacements or periodic inspections properly in accordance with the Owner's Manual.

The transmission gear oil lubricates the operation of the transmission parts, protects the gears from abrasion particles, and maintains the smooth operation of the transmission's components. Because the oil will gradually lose its ability to lubricate, the replacement of the transmission gear oil at 30,000km intervals or once every 6 months is recommended. If you do not replace this oil, its reduced lubrication ability could be the cause of damage to gears or even cause them to seize and wear prematurely and ultimately could cause transmission failure.

The transmission gear oil filter is one of the very important components that filters iron particles, abrasive particles, and other foreign material from the transmission gear oil. If this oil filter gets filled with iron particles and other material, it can become clogged and lose its ability to remove abrasion particles and foreign material from the oil. Again, this could ultimately cause transmission failure. The replacement of the transmission gear oil filter at 30,000km or 6 months is recommended. The clutch is a crucial component that transmits and cuts off the power from the engine. The clutch fluid transmits the hydraulic pressure that is created when the driver steps on the clutch pedal to actuate the clutch. This fluid should be replaced once every 12 months. If it is not replaced, the clutch fluid could absorb moisture from the air that enters from the vents, which in turn could cause the fluid to degrade. And if the fluid is degraded, it could cause adverse effects on the clutch's interior components, potentially causing them to rust in piping, and this would lead to faulty clutch functions. Just as in the case of the brake components that we discussed in the previous issue (014), the regular inspection and replacement of parts, oil and fluid that we discuss here are very important points in contributing to the safe operation of your vehicle for years to come. Details have been included in your Owner's Manual so please make sure to read the Owner's Manual thoroughly.



Hino Motors, Ltd.  
Address: 3-1-1 Hinodai, Hino-shi, Tokyo, 191-8660, Japan  
Global Site: <http://www.hino-global.com>



©Hino Motors, Ltd. All rights reserved. No part of this publication may be reproduced, copied or transmitted in any form or by any means.

Printed in Japan

# HINO Cares

**Issue 015**

HINO continues to pursue quality.





Day 12: Hino's Dakar truck speeds through Fiambala on its way to Copiapo.

## Achieved a record 20 consecutive finishes!

**It is important to continue to take on this challenge because this is a race where “authenticity” is tested.**

Hino Team Sugawara

Driver, Car 1: Yoshimasa Sugawara

Driver, Car 2: Teruhito Sugawara

On January 15, 2011, two Hino trucks that raced in the Dakar Rally drove past the finish line in Buenos Aires after traversing the final stage, which stretched over a distance of 826km from Cordoba, Argentina. This was the moment that Hino achieved its 20th consecutive finish since it first entered the rally in 1991. The Dakar Rally 2011 took the contestants over a route spanning 9,458km from Buenos Aires to Arica and back to Buenos Aires in a period of 15 days. Of the 67 trucks that entered the Trucks

category, only 41 trucks or 61% were able to finish. With an overall finish rate of 50.1%, including motorbikes and cars, this year's race was an unusually harsh one where HINO TEAM SUGAWARA was able to show the world what they were made of. Car 1, piloted by Yoshimasa Sugawara, came in 13th, 3rd, and 2nd places in the Trucks, Series Production Trucks, and Under 10-liter categories, respectively. Car 2, piloted by Teruhito Sugawara, came in 9th, 1st, and 1st places in the Trucks, Series



Yoshimasa Sugawara



Teruhito Sugawara

Production Trucks, and Under 10-liter categories, respectively. This meant that Hino achieved a one-two finish in the Under 10-liter category, and championships in the Series Production Truck and Under 10-liter categories for the second year in a row. In June, six months after the conclusion of the 2011 race, Teruhito Sugawara had this to say in our interview for this issue of HINO Cares. “In addition to race conditions that are becoming harsher by the year, and as the race-modified monster trucks continue to boost their performance, we have had to ask ourselves how we are going to compete. I think this was a race where we got a glimpse of the answer to that question.” To face championship regulars in the Large Modified Trucks category and large trucks with over 900hp of power, HINO TEAM SUGAWARA increased the torque of their Hino Dakar trucks—called the little monsters—by 10% for this cutthroat race. Additionally, Car 2 had its aluminum rear body replaced with a carbon one and underwent other weight reducing measures to shed 200kg for this race. In a harsh environment where the contestants had to face Andes mountain crossings at elevations exceeding 3,000m, sand dune crossings where steep ups and downs were repeated over and over, and blistering deserts where maximum temperatures reached 50°C, the Hino Dakar trucks showed their persistence in treacherous stages where a large number of vehicles turned over. “These treacherous situations are precisely what create opportunities

for HINO TEAM SUGAWARA.” Teruhito says he got the feeling that higher rankings were within reach as he was able to keep the heat on the top 5 contestants in the Trucks category in various stages of the race. And as if to infuse the trucks with this bit of inspiration, Hino's best and brightest, primarily from development departments, are currently fabricating the Hino Dakar truck that will be competing in next year's race.



The goal ceremony at Buenos Aires.



How has HINO TEAM SUGAWARA been able to finish for 20 consecutive years in the Dakar Rally, which many consider to be the world's harshest race? We posed this question to Yoshimasa Sugawara who holds the record for the most consecutive race entries at 28, and a record 20 consecutive finishes. His somewhat unexpected reply was, “We've had miracles happen in every race.” Although we think he was being modest, these words from the “Japanese Legend of Dakar” reminded us of a comment made by a certain intellectual: “Luck” is what happens when ‘preparation’ meets ‘opportunity.’ We can only conclude that these “miracles” continue to occur because the race presents the team with “opportunities” where the comprehensive “preparations”

made for the Dakar Rally—an extensive range of experiential know-how, meticulous planning, trucks whose performance is enhanced for the race, and the passion of Hino and all staff members for this race, are able to realize their potential. We asked him one last question before ending our interview: Why do you continue to take on the challenge of the Dakar Rally? “That's because this race is ‘authentic.’” He continues, “The race tests the authenticity of the trucks' performance and quality, the authenticity of teamwork, and the authenticity of our passion in an authentic, untouched, natural setting.” As long as HINO TEAM SUGAWARA remains “authentic,” Hino fans around the world should be able to continue to see Hino trucks racing in the Dakar Rally.

# Our true intention in continuing to take on the challenge

**It is where we can verify Hino's manufacturing policy.**

Masakazu Ichikawa,  
EXECUTIVE VICE PRESIDENT, MEMBER OF THE BOARD

Toshiki Inoue,  
EXECUTIVE VICE PRESIDENT, MEMBER OF THE BOARD



"All I can do is show you the 'door to adventure.' It is you who must open the door. If you wish, I will take you there." These words uttered during the first race in 1978 by Thierry Sabine, the founder of the Dakar Rally, inaugurated what has since come to be considered the most extreme race in the world. In 1991 Hino opened that "door to adventure" when it first entered the rally. Since that time, Hino has entered 20 consecutive races and finished in all of them. What does this momentous feat mean to Hino? In the following interview with the vice presidents, Mr. Masakazu Ichikawa and Mr. Toshiki Inoue, we would like to explore Hino's true intention in continuing to rise to the challenge of the Dakar Rally.

Entry in the Dakar Rally was originally one of the projects that Hino embarked on to mark the 50th anniversary of its founding. Mr. Ichikawa was on the team that conceived and planned this project, and is one of the most knowledgeable individuals with regards to Hino's history of overcoming the adversities of



the Dakar Rally. Firstly, we asked Mr. Ichikawa which race made the biggest impression on him. "The most moving moment is when our trucks completed the race and crossed the finish line. So in that respect, each and every race has made a big impression on me." In 1997, Hino became the first in the history of the rally to post a 1-2-3 finish in the Trucks category. As of 2011, Hino has won 11 championships in the Under 10-liter category. While there have been countless such races in the history books, the reason why all the races made a special impression on Mr. Ichikawa is that he sees "the significance in the fact that Hino has finished in all the races." Mr. Inoue, who is responsible for Hino's Development Division, has given us an answer that explains this: "You could say that the Dakar Rally is a testing ground where we can prove we are on the right track with one of our vehicle manufacturing philosophies emphasizing Quality, Durability, and Reliability (QDR). If our primary objective were to go after the monster trucks, which it is fair to say are made especially for racing, we would have adopted a different strategy. But at Hino, we have consciously focused on entering the race using medium-duty production trucks, which is one of our core products." The greater the potential of the base-truck, the more the abilities of the truck can be brought out through fine tuning to create a truly refined racing machine. For this reason, there can be no shortcuts in pursuing the enhancement of the QDR of the base-truck. Hino's racing trucks for the Dakar Rally are based on trucks that their customers use. Mr. Inoue explains passionately that "in the future, we might enter a hybrid truck in the race, a type of truck for which we expect to see major growth in demand as we move forward."



It goes without saying that winning and finishing a race is not determined solely by the performance of the trucks. The skills of the drivers, which are backed by their experience and instincts, the decision-making ability of the navigators who must be able to give accurate instructions in an instant, the technical capabilities of the mechanics who maintain the racing trucks in their best condition, and the support of all Hino employees as well as our associates and sponsors, and the teamwork between everyone involved is indispensable. "Hino provides product conception, development, sales, and after-sale services in a vertically integrated operation. As such, team Hino cannot maintain its solidarity unless all staff members working in different sections share and are tied together with the same passion," states Mr. Ichikawa emphatically. "The thing that ties us together at Hino is our intrepid spirit where we strive to never give up until we achieve our goals. This spirit is also being tested in the Dakar Rally. We take on the challenge of developing new technologies and providing services with high levels of customer satisfaction, or the challenge to evolve from "Japan's Hino" to "the world's Hino". As long as we maintain such dauntless spirit as a corporation, we will continue taking on the challenge of the Dakar Rally." Hino's true intention in the Dakar Rally has a strong connection with their spirit to maintaining its passion in vehicle manufacturing.



2009 Dakar Rally Argentina-Chile: Masakazu Ichikawa congratulates Yoshimasa Sugawara for his 20th consecutive finish, a Dakar Rally record.



**1991**

Paris - Tripoli - Dakar / 9,186 km / 7th, 10th, 14th / no class divisions



Paris - Sirte - Cape Town / 13,015 km / 4th, 5th, 6th, 10th / no class divisions



Paris - Dakar / 8,877 km / 6th / no class divisions



Paris - Dakar / 13,398 km / 2nd / no class divisions



Granada - Dakar / 10,067 km / 2nd / no class divisions



Granada - Dakar / 7,579 km / 6th, 11th / Winner, 2nd



**1997**

Dakar - Agades - Dakar / 8,051 km / Winner, 2nd, 3rd / Winner, 2nd, 3rd



Paris - Granada - Dakar / 10,570 km / 2nd / Winner



Granada - Dakar / 9,441 km / 4th / Winner

**2000**



Paris - Dakar - Cairo / 7,880 km / 5th / Winner

**Hino's spirit  
of challenge  
has traversed  
countless terrain.**

**A 20-year history:  
1991 to 2000**

Route / Total Distance / Truck Overall Ranking / Under 10-liter Class Ranking



Each of the 20 races that Hino took on at the Dakar Rally is testimony to Hino's fervent passion.



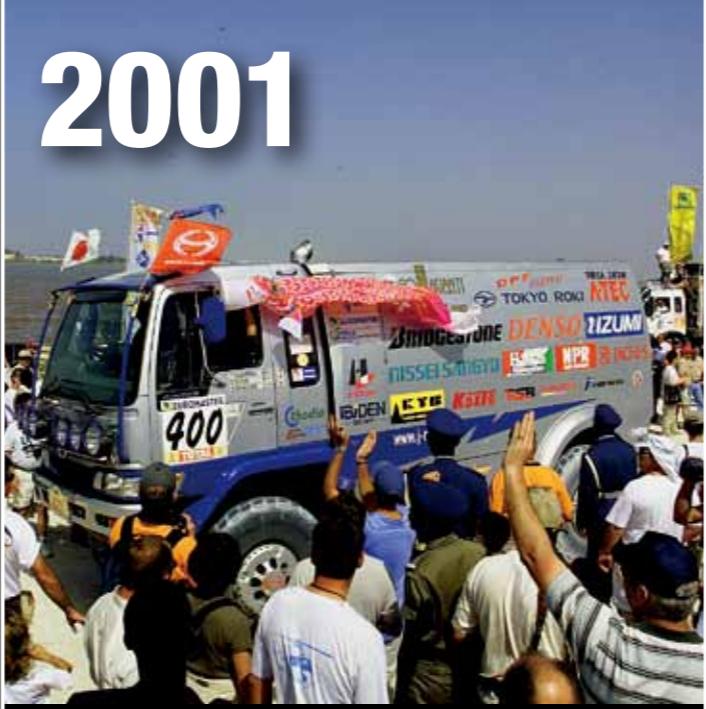
Hino's spirit  
of challenge  
has traversed  
countless terrain.

A 20-year history:  
2001 to 2011

Route / Total Distance / Truck Overall Ranking / Under 10-liter Class Ranking



2001



Paris - Dakar / 10,873 km /  
2nd / **Winner**

2002



Arras - Madrid - Dakar / 9,440 km /  
3rd / **Winner**

2003



Marseille - Sharm El Sheikh /  
8,602 km / 5th / no class divisions

2004



Clermont-Ferrand - Dakar /  
10,411 km / 5th / no class divisions

2005



Barcelona - Dakar / 8,956 km /  
2nd, 6th / **Winner**

2006



Lisbon - Dakar / 9,043 km /  
5th, 7th / no class divisions



2007

Lisbon - Dakar /  
7,915 km /  
9th, 13th /  
**Winner**



2010

Buenos Aires -  
Valparaiso -  
Buenos Aires /  
9,579 km /  
14th, 26th / 2nd

2011

Hino's spirit of challenge  
is undergoing further  
acceleration in  
preparation for  
its 21st appearance in  
the Dakar Rally 2012.  
Will Hino renew  
the record it holds for  
consecutive finishes?

**HINO TEAM SUGAWARA**  
continues to move  
forward towards  
the next challenge.

2009



Paris - Tripoli - Dakar /  
9,026km / 7th / **Winner**

Buenos Aires - Arica - Buenos Aires /  
9,458 km / 9th, 13th / **Winner**, 2nd



Five of Hino's best mechanics.

## Hino's Dakar Rally Trucks

**“Little Monsters”**  
**There is more to the name than their performance potential.**

Hino's Dakar Rally Trucks are based on the HINO 500 Series, which are world-renowned for their durability. They are respectfully referred to as the “Little Monsters” by their rivals as these mid-sized trucks squarely take on monster trucks powered by engines with more than twice their displacement. The fact that these under 10-liter series production trucks were able to compete with larger trucks in the Modified Trucks category,

one of which came in 9th overall in the 2011 race, is not only testimony to the road ability and durability of the HINO 500 Series, but also proof of the overall excellence in terms of ability throughout the team, including its mechanics. On this page, we would like to introduce you to the mechanics who have supported the challenge of taking on this grueling race and worked to extract every drop of potential from the Hino Dakar Rally trucks.



Mechanics work through the night at San Miguel de Tucumán (Argentina).



Going over the details. Maintenance is a race against time.



Car 1 races through the Atacama Desert.

## Hino's best and brightest mechanics are proud bearers of Hino's name and expectations.

Each year, Hino chooses mechanics for the Dakar Rally to give them a hands-on learning opportunity that will also help them develop an unwavering spirit of challenge. The following are comments voiced by the mechanics of the 2011 race who were chosen in a rigorous screening process.



Takayuki Monma

Hino Motors, Ltd.  
Middle-East,  
Euro & Africa Group,  
Regional Service Department,  
Overseas Service Division

Third-time team member in  
addition to the 2004 and 2010  
Dakar Rallies.

As the various stages of the rally get increasingly difficult every year, the trucks are subjected to increasingly intense loads, which is directly reflected in the increased mechanics' workload. The work was very tough and everyone on the mechanic team gave their best. It's no easy feat to ensure that the Hino Dakar trucks finish and achieve high positioned when ranked against rivals with much larger engine displacements. This is achieved by handling the trucks with utmost care. I am very proud of Yoshimasa Sugawara's passion and spirit as a Japanese, and equally proud of the reliability of Hino trucks.



Masayoshi Yamamoto

Hino Motors, Ltd.  
Overseas Training Group,  
Service Training Department,  
Technical Service Div.

It was a grueling race and there were many sleepless nights. Although we did have some difficulties in working in unfamiliar settings, e.g. on sandy ground, I am very happy that both trucks were able to finish the race without event. I personally gained a great sense of achievement, and was also reassured by the excellent performance of Hino trucks, of which there is much to be proud of. I would like to draw on the experience I gained in this race to meet new challenges positively, and communicate the spirit to younger generations.



Takashi Sanno

Yokohama Hino Motors, Ltd.  
Eleven years' experience as a  
mechanic. Hino HS-1 certified\*  
Winner of the Award of  
Excellence at the Hino National  
Service Skills Competition.

I applied for this position with the desire to make a change within myself by actually taking part in this race. I was elated when I was chosen, but I also felt considerable pressure. I gave it my all so I would have no regrets later, and I was able to finish the job, so ultimately, this experience has boosted my confidence. I also realized the importance of the mechanic's job, and the great responsibility with which we are entrusted. I look forward to communicating the experience and spirit that this race has given me to others.



Hiroshi Hashiba

Ishikawa Hino Motors, Ltd.  
Sixteen years' experience as a  
mechanic. Hino HS-1 certified  
Second-time team member in  
addition to the 2004 Dakar Rally.

The course in South America was more extreme than I had expected. During the first half in particular, the rear brake shoes would wear very quickly. We had to disassemble the rear brakes every day, which deprived us of considerable sleep time. I think my communication skills have improved after the race. Everything from issue sharing, reporting, notifications, and consultations in our workshop has become smoother, which has accelerated service turnaround times overall. Additionally, I am now better able to handle irregular tasks such as on-the-road breakdowns.



Kenichi Suetsugu

Hiroshima Hino Motors, Ltd.  
Nine years' experience as a  
mechanic. Hino HS-1 certified  
Fourth mechanic to take part  
from Hiroshima Hino (previously  
1996, 2005, and 2010).

We had considerable brake drum issues during the first half of the race, but the situation improved in the latter half. While the other teams saw their problems mount up, the Hino team was able to carry on the race without much event. In terms of my post-race work, I've been able to come up with more ideas for emergency repair jobs, and I have the feeling that I've taken a solid step forward in my growth as a mechanic. I would like to draw on this experience to provide our customers with more satisfying service.

\* Hino HS-1 certification: Hino Service skills 1st grade. The top Hino certification for servicing skills. As of October 2010, 406 mechanics nationwide (among 3,407 licensed mechanics) held this certification.