Dalian, People’s Republic of China: In August 2008, Volkswagen Group began construction of its newest state-of-the-art transmission plant in the world in Dalian in China’s northeast. Almost 17 months later, in January 2010, series production for the DSG® 00200 Direct-Shift Gearbox started at Volkswagen Automatic Transmission (Dalian) Co., Ltd. In 2011, annual production output has already reached 350,000 transmissions, and the second expansion phase for a capacity of approximately 600,000 transmissions is scheduled for 2012. It was a masterful performance of Volkswagen project management—and a challenge for globally operating suppliers such as HOERBIGER. (Page 30)
MOBILITY AND COMFORT FOR THE MOST POPULOUS COUNTRY IN THE WORLD

Anyone who has not visited China over the last few years and personally witnessed the speed at which the country is evolving will have a difficult time appreciating the rapid construction of Volkswagen Automotive Transmission (Dalian) Co., Ltd., VWATD. In September 2007, Volkswagen corporate management in Wolfsburg, Germany, approved the new transmission plant project. The objective was to exclusively manufacture the DSG® DQ200 direct-shift gearbox for the Chinese market. By the end of 2011, Volkswagen is already producing as many as 350,000 transmissions a year in Dalian. Production of the site is scheduled to balloon to 900,000 transmissions by the end of 2014.
The DSG® (Direct-Shift Gearbox) DQ200 transmission is an advancement of the DSG® DQ250 double-clutch transmission launched in Germany in August 2003 with the Golf IV R32. The innovative transmission was designed with a dry seven-speed double clutch for a torque of 250 Newton meters (Nm) and engine power output of up to 125 kilowatts. It is installed as a front-transverse transmission.

In August 2008, the DSG® DQ200 transmission celebrated its premier in Germany in the Golf V and the Touran. Its specifications make the direct-shift gearbox equally suited for a variety of vehicle types. The applications range from the small Polo to the Passat, a mid-range sedan.

The ideal Transmission for China

Because of its broad application spectrum, the DSG® DQ200 transmission is truly a global transmission for Volkswagen: the diversity of the new direct-shift gearbox ideally satisfies the market requirements in Asia, and particularly in China.

China is a sales market that poses special challenges in many respects. When designing a Volkswagen for the most populous country in the world, consideration must be given, for example, to the regionally severely fluctuating temperatures and frequently extremely high humidity as compared to Europe.

The greatest difference in comparison with Europe, however, is the driving style: “Our customers in China move about at low torque in the lower speed ranges.” Thomas Ogos explains, Head of Purchasing at VWATD.

The 37-year-old Head of Purchasing knows what he is talking about. He was also involved in the development of Volkswagen Group China (VGC) in Beijing between 2004 and 2007. After working in Germany for three years, he returned to China with his family in 2010 for VWATD. “The reason behind the slow traffic flow is urbanization, which leads to gridlock in the rapidly growing cities.” Congestion and stop-and-go traffic are on the rise. This leads to a growing demand for automatic transmissions.

Drivers in China learn in driving school to upshift to the next gear early. “When Europeans are still in second gear, the Chinese are already in 5th gear.” The goal is to minimize fuel consumption.

The Customer’s Focus: Efficiency ...

This is where the DSG® DQ200 transmission from Volkswagen can score points. Thomas Ogos says, “In conjunction with the EA 111 1.4-liter TSI engine, we achieve fuel savings of approximately 25 percent compared to a regular automatic transmission.” This is a compelling argument, notably in China, a country that since the 2010 World Expo would like to raise its international profile when it comes to the protection of the environment. Vehicles equipped with the 1.4-liter TSI engine and the DSG® DQ200 transmission are therefore in great demand.

As in Europe, popular small and compact vehicles in China include the Polo, Golf and Touran as well as the Fabia, Superb and Octavia produced by Volkswagen subsidiary Skoda. The Sagitar and Lavida models as well as the 1.4-liter version of the Magotan are three in-house developments that are offered exclusively on the Chinese market and round out the Volkswagen product range. In the future, all models will be available with the new direct-shift gearbox—including the New Bora. >

“...are already in 5th.”

Thomas Ogos, Head of Purchasing at VWATD

Volkswagen employee Gao Liqiu installs the HOERRBIGER sliding sleeve in a first assembly step.

HOERRBIGER supplies the sliding sleeves, a key component of the transmissions. In addition to know-how, proximity to the customer is essential.

The second site of HOERRBIGER Drive Technology in Changzhou, China, was constructed in conjunction with the Volkswagen transmission plant in conjunction with the Volkswagen transmission plant.
“In the Volkswagen Group, we are presently the showcase plant when it comes to transmissions”

Zafer Celik, Deputy Supervisor Assembly Production Department

... Features and Comfort

In larger vehicle categories, Volkswagen offers the direct-shift gearbox in combination with a 1.8-liter TSI engine, such as in the 1.8-liter version of Skoda’s Octavia and in the Magotan. The Magotan is a sedan in the upper mid-size class. It was developed specifically for the Chinese market. “In this vehicle class, Chinese customers attach importance to a sophisticated ambiance,” Thomas Ogos explains. “Leather interior and air-conditioning come standard, as does the shift comfort of the direct-shift gearbox.”

Until January 2010, the DSG® DQ200 was built only at Volkswagen in Kassel, Germany. Dalian is the second plant worldwide in the Volkswagen Group to produce the direct-shift gearbox. The synchronizer rings of the transmission are inserted in the sliding sleeve.

Site rich in Industrial Tradition

There were two good reasons for selecting the metropolis in China’s north—which six million people call their home—as the site for the transmission plant. Dalian already had a FAW VW engine plant, which is a joint venture between the Chinese automobile manufacturer First Automotive Works and Volkswagen. Thomas Ogos says, “This allowed us to take advantage of synergies and we did not have to start completely from scratch.” Moreover, Dalian is conveniently situated between the Changchun site (FAW VW) in the north and the Shanghai (SWV) and Chengdu (FAW VW) locations in the south.

The special conditions of the New Urban District of Dalian, a communal development zone in Dalian’s north, played another role. Volkswagen and other industrial investors encounter an ideal environment here for establishing new production plants and development centers. The city and government assure the necessary living quarters and the entire infrastructure. The economic structure of the city as a location that has a long tradition in shipbuilding and mechanical engineering as well as in electronics and IT industry also favored Dalian.

Showcase Plant in the Volkswagen Group

Zafer Celik, Deputy Supervisor Assembly Production Department, is one of the experts in charge of developing the production operation. The vertical integration of the site encompasses machining of the drive wheels, 13 gear wheels and five shafts of the DSG® DQ200 transmission before and after heat treating. Other key parts of the operation include the Heat Treatment Shop with five pusher-type furnaces and two rotary hearth furnaces as well as Assembly and Testing. The employees receive with their final, job-specific training at Volkswagen using special group learning cells. The members are not integrated into the operation teams until they master every assembly step “practically blind-folded.”

In the Volkswagen Group, we are presently the showcase plant when it comes to transmissions,” says Zafer Celik. A continuous improvement process (KVP) and the Kanban system make the site efficient. “We are very proud of all that. Worldwide, our scrap rate is the lowest in the Volkswagen Group.”

Zafer Celik started his career in 1986 at Volkswagen in Kassel in gear manufacturing. Aside from his job and his responsibilities as a family man, he completed his master craftsman training before switching to the Volkswagen Preproduction Technology Center in Kassel. From there, he went to Dalian on September 1, 2009 to support the start of production: “I began with 40 employees here.” Today, transmission assembly has approximately 200 employees in a four-shift operation. Approximately another 150 mechatronics employees are also part of the team of the 43-year-old. Over the course of the second expansion phase, the number of employees will more than double.

Zafer Celik says, “We established contact with the schools, universities of applied science and universities here in Dalian, in Shanghai as well as in Changchun long before building the new site. The students were already being prepared then for their work at Volkswagen. This meant they were available in time for the development of the transmission plant in Dalian.”

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Fully utilized for Years to come

A look at the current model range of Volkswagen reveals that the market in the largest and most populous automobile nation of the world is changing. So far, Volkswagen classics, the Santana and Jetta, which since their launch in the 1980s have been repeatedly upgraded in several model generations, remain two of the most widely driven passenger cars in China.

In the near future, customization will be increasingly in demand. Volkswagen has anticipated these changing customer expectations and in China is offering a suitable vehicle for every customer’s desire due to its extremely broad and diverse range of a whole host of model variants.

The majority of these vehicles will likely not be equipped with classic manual transmissions in the future, but rather with modern direct-shift...
The DSG® DQ200 direct-shift gearbox consists of about 200 parts in total. For its production, Volkswagen procures semi-finished parts and components from approximately 50 suppliers. In 2010, approximately 60 percent of these parts were imported to China, primarily from Europe. The share from local production is scheduled to climb to approximately 90 percent by the end of 2012. The suppliers that work with the Volkswagen Group around the world are required to have a global presence, implement uniform quality standards around the world and optimize material costs by employing synergies and localization. One example is HOERBIGER Drive Technology (Changzhou) Co., Ltd. (HDC). The second location of HOERBIGER Drive Technology in China opened in October 2010 was designed and constructed in conjunction with the development of the Volkswagen transmission plant in Dalian. This facility produces the sliding sleeves for the DSG® DQ200 gearbox, which is a performance- and comfort-defining key component of the transmission.

Putting out 9.16 million vehicles, China was the largest automobile producer worldwide in the first half of 2011, followed by the USA with 4.26 million vehicles, Japan with 3.43 million vehicles, and Germany with 3.2 million vehicles. Boasting 4.13 million vehicles sold, the Volkswagen Group ranked number 2 among automobile manufacturers behind General Motors with 4.54 million vehicles. Volkswagen sold 1.1 million vehicles in China between January and June 2011. This is a year-over-year increase of 16.5 percent. Nine sites out of the 62 production plants of the Volkswagen Group are now located in China. Volkswagen anticipates continued growth of the Asian markets for the foreseeable future. “We are producing exclusively for the local market,” explains Zafer Celik. “Every transmission we produce is practically already sold. In the coming years, no transmission from Chinese production is likely to be exported.”

Volkswagen has been active in China since 1984. At that time, Shanghai Volkswagen (SVW) was founded as a joint venture. This was followed in 1990 by the inception of FAW VW, which is a joint venture between the Chinese automobile manufacturer First Automotive Works and Volkswagen. The first vehicles built in China were the Jetta and Santana. Hundreds of thousands of these reliable cars can still be found on the roads, primarily as taxis, but also as personal vehicles.

The involvement of Volkswagen in China was aimed at developing powerful local production to allow the country to supply its own modern motor vehicles. Volkswagen Automatic Transmission (Dalian) Co., Ltd. is the first Volkswagen component plant in China that is not backed by a joint venture partner. VWATD is a wholly owned subsidiary of Volkswagen AG.

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