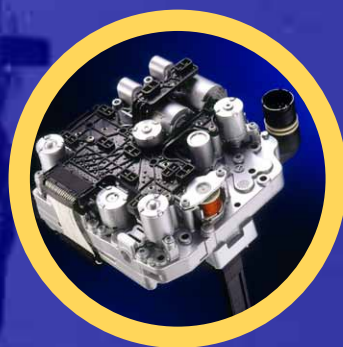
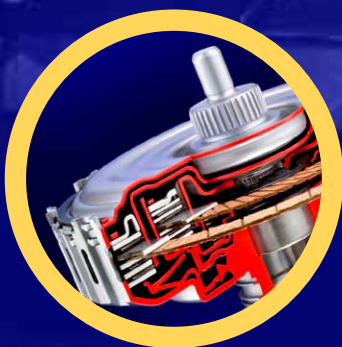


Global market review of OE gearbox clutches – forecasts to 2017

2010 edition



Just-auto

Global market review of OE gearbox clutches – forecasts to 2017

2010 edition

May 2010

By Matthew Beecham

Published by

Aroq Limited
Seneca House
Buntsford Park Road
Bromsgrove
Worcestershire
B60 3DX
United Kingdom

Tel: +44 (0)1527 573 600

Fax: +44 (0)1527 577 423

Web: www.just-auto.com

Registered in England no: 4307068

Single-user licence edition

This report is provided for individual use only. If you would like to share this report with your colleagues, please order additional copies or sign up for a multi-user licence by contacting:

Chris Clarke

Research manager, just-auto.com

Tel: +44 (0)1527 573 615

Email: chris.clarke@just-auto.com

Copyright statement

© 2010 All content copyright Aroq Limited. All rights reserved.

This publication, or any part of it, may not be copied, reproduced, stored in a retrieval system, or be transmitted in any form by any means electronic, mechanical, photocopying, recording or otherwise without the prior written permission of Aroq Limited. This report is the product of extensive research work. It is protected by copyright under the Copyright, Designs and Patents Act 1988. The authors of Aroq Limited's research reports are drawn from a wide range of professional and academic disciplines. The facts within this report are believed to be correct at the time of publication but cannot be guaranteed. All information within this study has been reasonably verified to the author's and publisher's ability, but neither accept responsibility for loss arising from decisions based on this report.

Incredible ROI for your budget – single and multi-user licences

We understand the pressure your research budget is under and price our reports realistically. You won't find our reports with four, or even five-figure price tags, but you will find that they make some of the competition look expensive. Each title is available to you on a single-user basis, supplied on the strict understanding that each title is not to be copied or shared. Alternatively, titles can be shared within departments or entire corporations via a cost-effective multi-user licence. Multi-user licences can also save you money by avoiding unnecessary order duplication. To further add value, all multi-user

copies are hosted on a password protected extranet for your department or company – saving you time, resources and effort when sharing research with your colleagues. To find out more about multi-user pricing, please contact Chris Clarke.

just-auto.com membership

From just GBP99/US\$170/EUR120* a year you will gain access to a growing portfolio of exclusive management briefing reports, and also receive 12 new briefings for each year you are a member. As well as this impressive list of members' only reports, you also gain one year's access to a constantly-updated stream of news, feature articles and analysis. Established in 1999, *just-auto* has rapidly evolved into the premier source of global automotive news, analysis and data for busy senior executives. For details of the current special joining offer visit: www.just-auto.com/offer.aspx

*Prices correct at time of publication.

Contents

| | |
|---|-------------|
| Single-user licence edition | ii |
| Copyright statement..... | ii |
| Incredible ROI for your budget – single and multi-user licences | ii |
| just-auto.com membership..... | iii |
| Contents | iv |
| List of figures | vi |
| List of tables | vii |
| Preface | viii |
| Research methodology | viii |
| Report coverage | viii |
| The author | ix |
| Chapter 1 Introduction | 1 |
| Chapter 2 The market | 2 |
| Market players | 2 |
| Aisin Seiki..... | 2 |
| Exedy Corp..... | 2 |
| FCC Co Ltd | 2 |
| LuK..... | 3 |
| Q&A with LuK..... | 3 |
| Valeo..... | 5 |
| ZF Sachs..... | 6 |
| Q&A with ZF | 6 |
| Getrag | 10 |
| Q&A with Getrag..... | 10 |
| Market shares | 12 |
| World clutch market..... | 12 |
| European clutch market..... | 13 |
| Japanese clutch market..... | 14 |
| North American clutch market..... | 15 |
| Market forecasts | 16 |
| Chapter 3 Technical review | 26 |
| Defining the elements | 26 |
| Recent innovations | 28 |
| Q&A with Torotrak..... | 29 |
| Q&A with Prodrive..... | 34 |
| Q&A with Vocis Driveline Controls..... | 36 |
| Q&A with BorgWarner..... | 40 |

| | |
|--------------------------------------|-----------|
| Chapter 4 Manufacturers | 46 |
| Aisin Seiki | 46 |
| Exedy Corp..... | 47 |
| FCC Co Ltd..... | 48 |
| LuK..... | 53 |
| Valeo | 55 |
| ZF Sachs | 57 |

List of figures

| | |
|--|----|
| Figure 1: Worldwide manufacturer shares for OE clutch sets (clutch discs and covers) for passenger cars and light vehicles, 2009 (% of volume)..... | 13 |
| Figure 2: European manufacturer shares for OE clutch sets (clutch discs and covers) for passenger cars and light vehicles, 2009 (% of volume)..... | 14 |
| Figure 3: Japanese manufacturer shares for OE clutch sets (clutch discs and covers) for passenger cars and light vehicles, 2009 (% of volume)..... | 15 |
| Figure 4: North American manufacturer shares for OE clutch sets (clutch discs and covers) for passenger cars and light vehicles, 2009 (% of volume)..... | 15 |
| Figure 5: FCC Co Ltd's sales by product segment, 2009 (% of net sales) | 52 |

List of tables

| | |
|---|----|
| Table 1: Manual gearbox OE clutch markets, percentage fitment and volume for passenger cars produced in North America, Europe, Japan and China, expected case, best case and worst case scenarios, 2007-2017 (% and no. of units) | 16 |
| Table 2: Manual gearbox OE clutch market values for passenger cars produced in North America, Europe, Japan and China, expected case, best case and worst case scenarios, 2007-2017 (EUR '000s) | 18 |
| Table 3: Automated manual transmission markets, volume for passenger cars produced in North America, Europe, Japan and China, expected case, best case and worst case scenarios, 2007-2017 (no. of units) | 20 |
| Table 4: Automated manual transmission market values for passenger cars produced in North America, Europe, Japan and China, expected case, best case and worst case scenarios, 2007-2017 (EUR '000s) | 21 |
| Table 5: Dual clutch transmission market volumes for passenger cars produced in North America, Europe, Japan and China, expected case, best case and worst case scenarios, 2007-2017 (no. of units) | 22 |
| Table 6: Dual clutch transmission market values for passenger cars produced in North America, Europe, Japan and China, expected case, best case and worst case scenarios, 2007-2017 (EUR '000s) | 24 |
| Table 7: Exedy Corp's clutch production facilities worldwide, 2010 | 48 |
| Table 8: FCC Co Ltd's capital expenditure, 2009-2010 (JPYm)..... | 49 |
| Table 9: LuK's clutch-related businesses worldwide, 2010..... | 54 |
| Table 10: Valeo Transmissions' facilities worldwide, 2010 | 56 |

Note: data in some tables may not sum due to rounding.

Preface

Research methodology

This report is intended to provide an overview of the vehicle clutch industry, providing top level market fitment, volume and value forecasts through 2017. Our forecasts are not extrapolative but dependent on the underlying drivers of supply and demand. Our forecasts are largely based on interviews with the author's extensive international network of industry contacts. This allows us to consider and explain the meaning and implications of industry events, rather than offer simple description based on incomplete data.

Our approach is divided into two distinct methodologies:

- qualitative interviews – these are generally opinion-based, which aim to build knowledge about future clutch market trends and company strategies;
- quantitative interviews – typically fact-based, focused on establishing market values, shares, and volumes.

Our research typically concentrates on applications for light vehicles which include all cars, light trucks and the various cross-over vehicle styles such as sports utility vehicles and people carriers. These vehicles collectively account for about 96% of the global vehicle build.

Our market forecasts are set out by major light vehicle-producing region, i.e. Europe, Japan, China and North America. For the purposes of this report, except where expressly stated, Europe includes Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland, Sweden, Turkey and the UK. North America includes the US, Canada and Mexico.

Report coverage

In this, the sixth edition of this report, *just-auto* reviews the key market drivers for vehicle clutches, and updates the market analysis. Following our market overview in Chapter 1, *just-auto's* product fitment forecasts in Chapter 2

predict the market (by volume and value) worldwide (and by major car-producing region) for manual transmissions and automated manual transmissions. This chapter includes exclusive interviews with senior executives of BorgWarner, Getrag, LuK, Prodrive, Vocis Driveline Controls, Torotrak and ZF. Chapter 3 reviews the technical advances in clutches, defining the parts that make up the clutch itself as well as what we can expect to see in tomorrow's cars. Chapter 4 sets out profiles of the major manufacturers, namely Aisin Seiki, Exedy, FCC, LuK, Valeo, and ZF.

The author

Matthew Beecham has more than 18 years' experience of researching, writing and analysing market and technical trends in the global automotive components industry. Since 2000, he has served as an associate editor for *just-auto*. In addition to clutches, he authors a range of global auto components' market research reviews, including batteries, braking systems, coatings, clutches, cockpits, driver assistance systems, door modules, electric motors, engine cooling systems, exhaust systems, front-end modules, fuel injection, fuel tanks, glazing systems, ignitions, interiors, lighting, mirrors, roof systems, shock absorbers, spark plugs, rotating electrics, tyres, tyre pressure monitoring systems, wheels and wipers. Matthew's freelance assignments have included working for AT Kearney, Belron, Bridgehead International, McKinsey, Kuwait Institute for Scientific Research, Motorsport Industry Association, Motor Industry Research Association and the Economist Intelligence Unit. He has also written for magazines including *Car Graphic* (Japan), *JAMA* (Japan) and *Automotive Engineer* (UK). He was awarded a PhD in automotive technology transfer from Cranfield University.

Chapter 1 Introduction

Europe may have long resisted the automatic gearbox, but new environmental and fuel efficiency legislation combined with major advances in electronics and manufacturing techniques are paving the way for a flood of new automated transmission technologies.

These include high-performance automated manual transmissions (AMTs), dual-clutch transmissions (DCTs), continuously variable transmissions (CVTs) for smaller vehicles and highly innovative new technologies such as Torotrak's infinitely variable transmission (IVT) and Antonov's automatic drive.

The most likely 'winner' (that will replace traditional automatics and boost market penetration of automated transmissions generally) will be the dual-clutch, pre-select DCT concept.

DCT is growing in significance due to its combination of refinement, efficiency, low cost and driving satisfaction. Supplier BorgWarner has long been associated with dual-clutch systems with Volkswagen. The VW Group pioneered this technology and continues to push dual-clutch technology in Europe. VW co-developed the six-speed dual-clutch gearboxes (branded DSG) with BorgWarner, making use of the supplier's DualTronic wet-clutch and control-system technology.

Chapter 2 The market

Market players

Aisin Seiki

Aisin Seiki's clutch products include clutch covers, discs, flywheel with torsional damper and torque converters for light vehicles, small- and medium-size trucks, buses and industrial vehicles. In Japan, Aisin produces clutch covers, discs and automatic transmissions at its Ogawa plant, in Anjo prefecture. Aisin also produces and sells clutches at its facilities located in Australia, Indonesia, Singapore, Thailand, Mexico and the US.

Exedy Corp

Exedy Corp is the largest independent OEM supplier of clutches in Japan. Exedy supplies all of the major Japanese vehicle makers and to Ford and GM in the US. Its product line-up includes torque converters and automatic transmission parts, clutch discs, clutch covers and dual mass flywheels, power shift transmissions, hydraulic clutches, machine devices, moulding devices and motorcycle clutches. The company currently employs xxxxxx people at its facilities in the US, Thailand, Malaysia, Indonesia, Vietnam, China and India.

FCC Co Ltd

FCC Co Ltd currently employs xxxxx people across its three operating divisions, namely motorcycle clutches (employing xxxxx people), vehicle clutches (xxxxx people) and other products (xxx people). The company also employs a further xxx people looking after the administration side of the business. FCC Co Ltd designs and produces clutches and clutch-related parts for motorcycles, passenger cars and other vehicles. The company mainly sells clutches for motorcycles and passenger cars to Honda. Its dependence is particularly high in relation to motorcycles, where the company supplies clutches for virtually all of Honda's requirements. For passenger car applications, the company supplies clutches for nearly all Honda cars fitted with automatic transmissions. Its other customers include Suzuki Motor, Yamaha Motor and Kawasaki Heavy Industries. On a geographical basis, Japan accounted for xx% of FCC's sales in the fiscal year ended 31 March 2009, North America (xx%), Asia (xx%) and the rest of the world made up the remaining x%.

Chapter 3 Technical review

Defining the elements

Transmissions generally fall into one of two camps:

- manually-shifted transmissions with spur gears in a countershaft arrangement;
- load-actuated automatic transmissions with planetary-gear sets.

According to Bosch, the basic elements of the manually-shifted transmission are:

- single or multiplate dry-clutch for interrupting and engaging the power flow; actuation may be power-assisted to deal with high operating forces;
- variable-ratio gear transmission unit featuring permanent-mesh gears in one of several individual assemblies;
- shift mechanism with shift lever.

A friction clutch consists of a pressure plate, a clutch disk – featuring bonded or riveted friction surfaces – and the second friction surface represented by the engine-mounted flywheel. The flywheel and pressure plate provide the thermal absorption required for friction operation of the clutch; flywheel and pressure plate are connected directly to the engine, while the clutch disk is mounted on the transmission's input shaft.

The pressure plate is basically the pressure mechanism that clamps the disc to the flywheel to get the vehicle moving. Pressing in the pedal relieves the pressure from the clutch disc to disengage the engine from the drivetrain for shifting or stopping.

The clutch disc is the central connecting element of the clutch. Together with the pressure plate, it disengages and engages the engine from and with the drivetrain. The clutch disc transfers engine torque to the transmission input shaft. The clutch disc is a flat plate with friction materials on both sides. As the pressure plate is engaged (pedal let out), the clutch disc is clamped to the flywheel. When the pressure plate is disengaged, (pedal pushed in) the clutch disc is unclamped. The disc is connected to the input shaft of the transmission

Chapter 4 Manufacturers

Aisin Seiki

Aisin Seiki is one of the leading manufacturers in terms of clutch sales, although it is still mainly concerned with the Asian market. Its drivetrain products group designs and produces automatic transmission; manual transmissions; automated manual transmissions; continuously variable transmission; clutch cover and discs. More specifically, its clutch products include:

- clutch covers;
- clutch discs (torsion rubber type);
- clutch discs (coil spring type);
- clutch disc (variable hysteresis type);
- flywheel with torsional damper;
- torque converter;
- electric oil pumps;
- semiconductor-type active speed sensor;
- aluminium die-casting oil pump cover;
- wet friction material for automatic transmission;
- dry friction material for manual transmissions.

Aisin Seiki describes its drivetrain products as its “*mainstay business*” comprising xx% of net sales. It supplies products for light vehicles, small- and medium-size trucks, buses and industrial vehicles.

In Japan, Aisin produces clutch covers, discs and automatic transmissions at its Ogawa plant, in Anjo prefecture. Aisin also produces and sells clutches at the following sites:

- Aisin (Australia) Pty Ltd – production of door latches and sales of clutches and domestic sewing machines;
- PT Aisin Indonesia – clutch covers and other drivetrain-related components, door latches and other body related components, intake manifolds and other engine related components;
- Liberty Mexicana SA de CV – production of water pumps and rebuilding of clutch covers;
- Aisin Asia Pte Ltd, Singapore – sales of clutches for the aftermarket and domestic sewing machines;