



Honda Motor Europe
(Motorcycle Division)



NEWS RELEASE FINAL

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2010 VFR1200F Dual Clutch Transmission

Introduction

In October 2009, Honda announced the arrival of the new VFR1200F, which saw a combination of sophisticated design and advanced engineering. An interpretation of the ultimate **road-sport machine** - a concept driven by extensive understanding of customer needs and the adoption of state-of-the-art technologies.

The VFR1200F has now been given a dual clutch transmission, the first time this technology has ever been available in the motorcycle world, featuring an automated clutch and shift operation. This delivers the same level of rider enjoyment as a manual transmission but with the flexibility of a fully electronic option for enhanced sport and comfort riding. This next-generation motorcycle shows one path to the future of motorcycling, with freedom of choice of how to ride being central to the motorcycle experience. Honda believes this is a significant development for the future of motorcycling with greater customer choice.

Honda's challenging spirit always aims to develop unique technology that goes beyond the norm. Though the means are complex, the goal is simple: to make motorcycles more fun and more rider-friendly for everyone; to bring emotion to people by making these dreams come true.

Background

For decades, manual shifting has served as an integral and required part of the motorcycling experience. But just as alternative shifting technologies were utilized to improve lap times at the highest levels of racing, electronic shifting has at last made its way into a large displacement, high-performance motorcycle.

Honda introduces dual clutch transmission, the world's first fully automatic dual clutch transmission for large-displacement motorcycles. This new transmission offers riders the enjoyment of full sports riding capabilities along with effortless and seamless operation, applied in a powerful, large-displacement machine. At the same time, this transmission's superior efficiency can deliver fuel efficiency equal to or better than a conventional manual transmission.

The dual clutch transmission features a light and compact design that allows it to be combined with existing engines without substantial layout modification.

Mechanically, the system is similar to the larger dual clutch transmissions fitted to automobiles which have more room for a large transmission system, allowing for long transmission shafts and multiple shafts.

However – space is at a premium on motorcycles; making it difficult to use an automotive-type dual clutch transmission. Limited ground clearance and shifting of the motorcycle's centre of gravity when turning are other limiting factors – as is potential interference with the rider's legs. To solve these problems, the Honda dual clutch transmission uses two main shafts and in-line hydraulic clutches. Then hydraulic passageways for the system are located behind the right side engine cover; making for a shorter transmission shaft so it will fit onto the motorcycle. Unlike typical automotive transmissions that use independent shifters to directly shift the gears, the motorcycle system uses a motorcycle-type shift drum, resulting in a simple and more compact shift mechanism.

Further, the new transmission delivers the precise acceleration control that is an integral part of sports riding, thanks to electronic control technology that helps ensure smooth, seamless gear changes. And since it uses conventional transmission gears, it behaves just like its manual transmission counterpart; giving valuable feedback to the rider. It's also as rugged and durable as the conventional manual transmissions that Honda has developed.

To respond to rider demands through a broad range of conditions and situations, the transmission offers three operating modes: two full-auto modes (D-mode for relaxed, fuel efficient operation and S-mode for sports riding), and a six-speed gear-select mode for full rider control via electronic trigger-shift controls that deliver the same shifting response as a manual transmission. As an indication of the deep level of innovation involved in developing such a novel transmission, Honda has 100 patents pending related to this design.

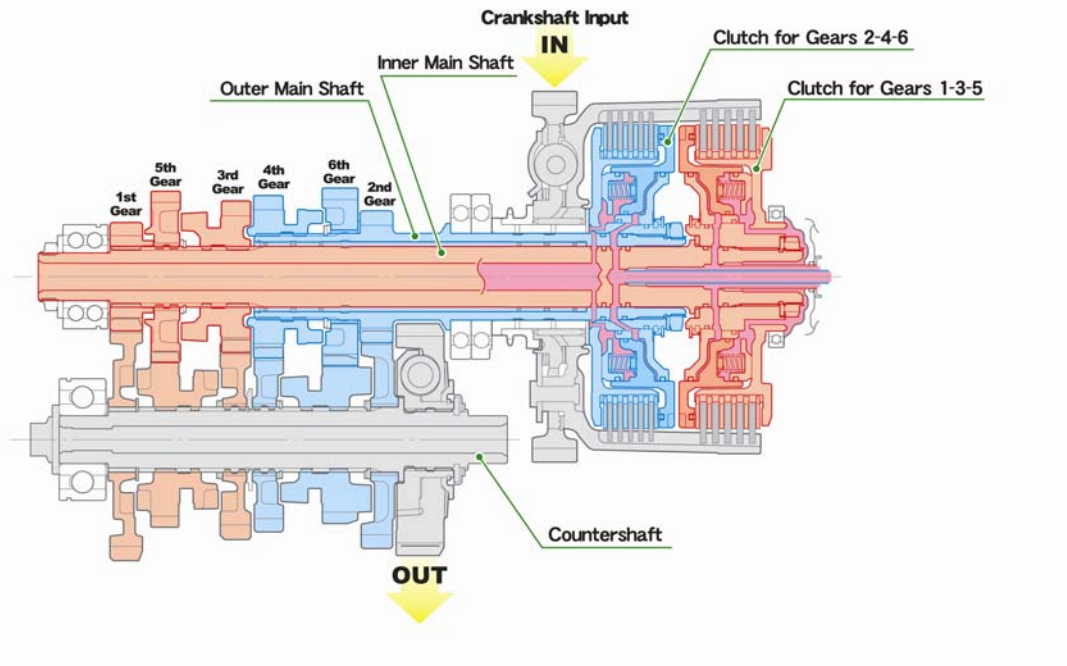


Key Features

The dual clutch transmission configuration employs independent clutches for the odd-numbered gears (1st, 3rd, 5th) and the even-numbered gears (2nd, 4th, 6th), respectively. The two clutches operate alternately to effect gear changes. For example, when changing from 1st to 2nd gear, the computer detects the up-shift and engages 2nd gear, then releases the 1st-gear clutch while engaging the 2nd-gear clutch to achieve a seamless gear change. It's a fast, smooth and efficient transition that delivers extremely quick shifts.

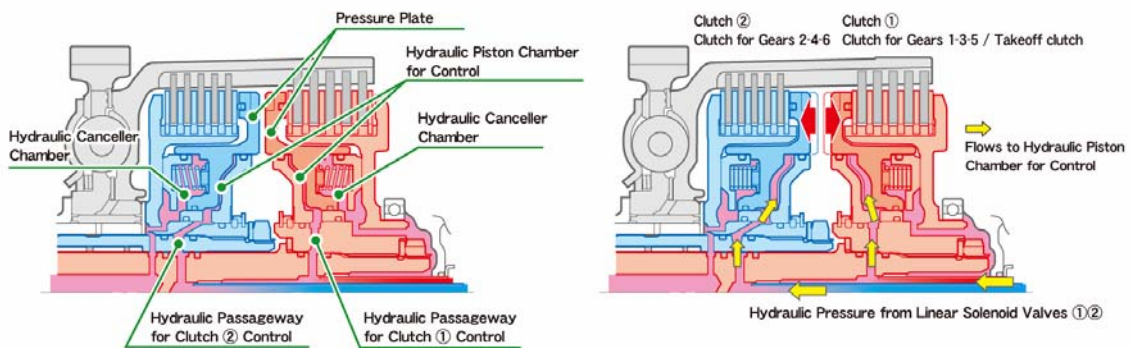
The VFR1200F Dual Clutch Transmission employs dual concentric input shafts (one shaft runs inside the other hollow shaft), an exclusive in-line clutch design, and concentration of hydraulic circuitry beneath the engine cover to achieve a compact design. Compactness and lightness is further enhanced through the use of a simple shift mechanism design based on that of a conventional motorcycle shift drum. Optimized shift scheduling achieves fuel efficiency equal to or better than that of a fully manual transmission, enabling this dual clutch transmission to deliver both sports riding and economical performance – whatever the rider chooses.

Dual Clutch Transmission Mechanism



Aluminum wet multi-plate dual clutch

The two clutches are laid out in-line along the transmission, with the hydraulic control of the piston installed on the inner face of the clutch disc. This configuration minimizes lateral intrusions in the direction of the engine.



Dual Clutch Transmission: How it works

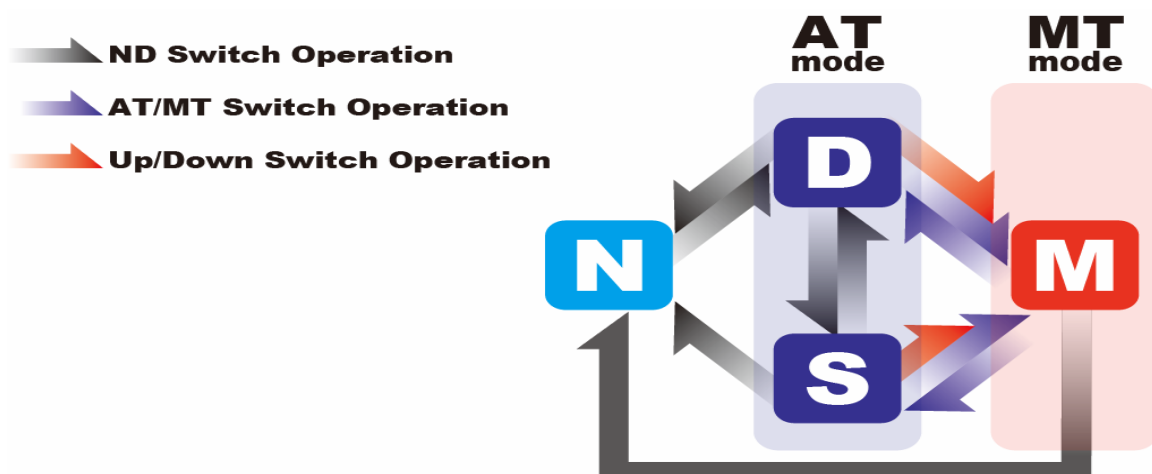
The dual clutch transmission features two operating modes (AT and MT) to suit the style of riding the rider chooses by selecting a switch located on the right handlebar:

In AT mode, all gear shifts are performed automatically, controlled by a microcomputer with an intelligent electronic shift function that constantly evaluates rider and motorcycle behaviour and recognises when to change gear. The rider chooses with the right thumb, either 'D' for maximum fuel efficiency, or 'S', for maximum performance. The clutch and gear shifts are then electronically controlled by the computer giving the rider the freedom to concentrate on enjoying the road ahead.

In MT mode, the rider uses the trigger shifters to select gears. In this mode, the rider can enjoy direct control of gear selection. Shifting up or down is operated by the '+' or '-' trigger with the left forefinger and thumb.

In every operation mode, the dual clutch transmission system offers quicker, smooth gear shifts with dependable traction and seamless acceleration because drive power is continuous.

This diagram shows show the rider can switch between modes and can use both the AT/MT switch and the triggers (Up/Down Switch) themselves to access the Manual option.



Benefit for the rider

Once an essential skill required for achieving the best riding experience, manual operation of a clutch and shift mechanism is no longer a must for motorcycle operation.

Honda has taken the world of motorcycling further with a new dimension in control and exhilaration. With innovative electronic gear shifting, the VFR1200F Dual Clutch Transmission offers high performance sport riding like no other machine.

Skilled riders as well as riders of less experience have one less task to deal with, which means more focus on the real joy of sports riding. Many riders will still prefer a manual-shift transmission, which is why the VFR1200F Dual Clutch Transmission gives a real choice. The MT mode gives riders an innovative new way to change gear to deliver effortless, seamless operation, and a truly revolutionary technological development for riders who are eager to embrace new technology.

The 2010 VFR1200F Dual Clutch Transmission puts full-on sports motorcycle abilities at your fingertips. This is effortless exhilaration. This is the freedom to ride how you want to.

Colours

In 2010 the VFR1200F Dual Clutch Transmission will make its debut in the same colours as the VFR1200F manual transmission:

- Seal Silver Metallic
- Candy Prominence Red
- Pearl Sunbeam White

Specifications **VFR1200F Dual Clutch Transmission** (ED-type/ F-type)

ENGINE

Type Liquid-cooled 4-stroke UNICAM 76° V-4

Displacement 1237cc

Bore × Stroke 81 × 60mm

Compression Ratio 12:1

Max. Power Output ED: 127kW/10,000min⁻¹ (95/1/EC)
F: 83kW/9,500min⁻¹ (95/1/EC)

Max. Torque ED: 129Nm/8,750min⁻¹ (95/1/EC)
F: 115Nm/4,000min⁻¹ (95/1/EC)

Idling Speed 1,150 min⁻¹

Oil Capacity 4.9 litres

FUEL SYSTEM

Carburation PGM-FI electronic fuel injection

Aircleaner Oil-permeated, viscous-type paper filter

Fuel Tank Capacity 18.5 litres

Fuel Consumption ED/E : 15.9 km/l
F : 15.9 km/l (tested in D-Mode)
(WMTC mode*)

ELECTRICAL SYSTEM

Ignition System	Computer-controlled digital transistorised with electronic advance
Ignition Timing	8.4° BTDC (idle speed)
Sparkplug Type	IMR9E-9HES (NGK); VUH27ES (DENSO)
Starter	Electric
Battery Capacity	12V/11.2Ah (YTZ14S)
ACG Output	570W
Headlights	H7x2 (55Wx2)
Tail-light	5Wx2, STOP LIGHT 21W(21/5W+5Wdual-light)

DRIVETRAIN

Clutch	Wet multi-plate, hydraulic, dual
Clutch Operation	Hydraulic
Transmission Type	Constant mesh 6-speed
Primary Reduction	1.738 (73/42)
Gear Ratios	1 2.4666 (37/15) 2 1.7894 (34/19) 3 1.4090 (31/22) 4 1.1600 (29/25) 5 1.0322 (32/31) 6 0.9393 (31/33)

Final Reduction 2.7061

Final Drive Shaft

FRAME

Type Diamond; aluminium twin-spar

CHASSIS

Dimensions (L×W×H) 2250 × 740× 1220mm

Wheelbase 1,545mm

Caster Angle 25.5°

Trail 101mm

Turning Radius 3.5m

Seat Height 815mm

Ground Clearance 125mm

Kerb Weight 277kg

Loaded Weight 473Kg

SUSPENSION

Type Front 43mm cartridge-type telescopic fork with stepless preload adjustment, 120mm axle travel
RearPro-Link with gas-charged damper,

25-step (*stepless remote-controlled hydraulic)
 preload and stepless rebound damping adjustment,
 130mm axle travel

WHEELS

Type	Front 5-spoke hollow gravity Die-cast aluminium Rear 7-spoke gravity Die-cast aluminium
Rim Size	Front 17M/C × MT3.50 Rear 17M/C × MT6.00
Tyre Size	Front 120/70 ZR17M/C (58W) Rear 190/55 ZR17M/C (75W)
Tyre Pressure	Front 250kPa Rear 290kPa

BRAKES

Type	Front 320mm dual floating hydraulic disc with two 6-piston callipers, C-ABS and sintered metal pads Rear 276mm hydraulic disc with 2-piston calliper, C-ABS and sintered metal pads
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All specifications are provisional and subject to change without notice.

* Please note that the figures provided are results obtained by Honda under standardized testing conditions prescribed by WMTC. Tests are conducted on a rolling road using a standard version of the vehicle with only one rider and no additional optional equipment. Actual fuel consumption may vary depending on how you ride, how you maintain your vehicle, weather, road conditions, tire pressure, installation of accessories, cargo, rider and passenger weight, and other factors.