

VOLVO CONSTRUCTION EQUIPMENT  
**OPTISHIFT**  
FOR L150F, L180F, L220F



**MORE CARE. BUILT IN.**





**EXPERIENCE** noun:  
- knowledge gained by actually doing or living through something  
- know-how





# Volvo Construction Equipment raises the bar on fuel efficiency. Again.

Volvo wheel loaders are world renowned for their low fuel consumption. Now, Volvo Construction Equipment engineers are driving technology again with Volvo OptiShift, a system designed to increase operator comfort and machine durability while optimizing fuel savings in applications such as Load and Carry by up to 15 percent.

## **Progress through tradition and innovation**

For us, some things will never change. Our core values of quality, safety and a mind to the environment have been guiding us even before the diesel engine. At Volvo Construction Equipment, tradition and innovation have always gone hand in hand. Experience and competence in symbiosis with creativity and curiosity have resulted in a long line of ingenious designs and revolutionary solutions. So when the industry calls for lower fuel consumption and emission reductions, we're not surprised. We've been pioneering those areas for decades.

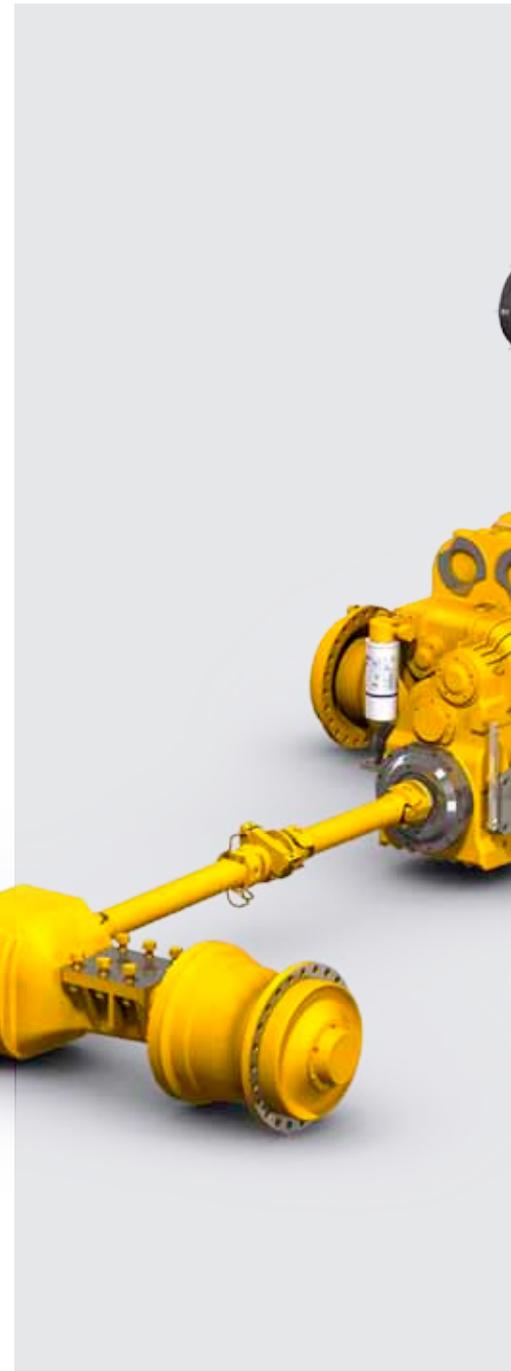
## **Volvo first again**

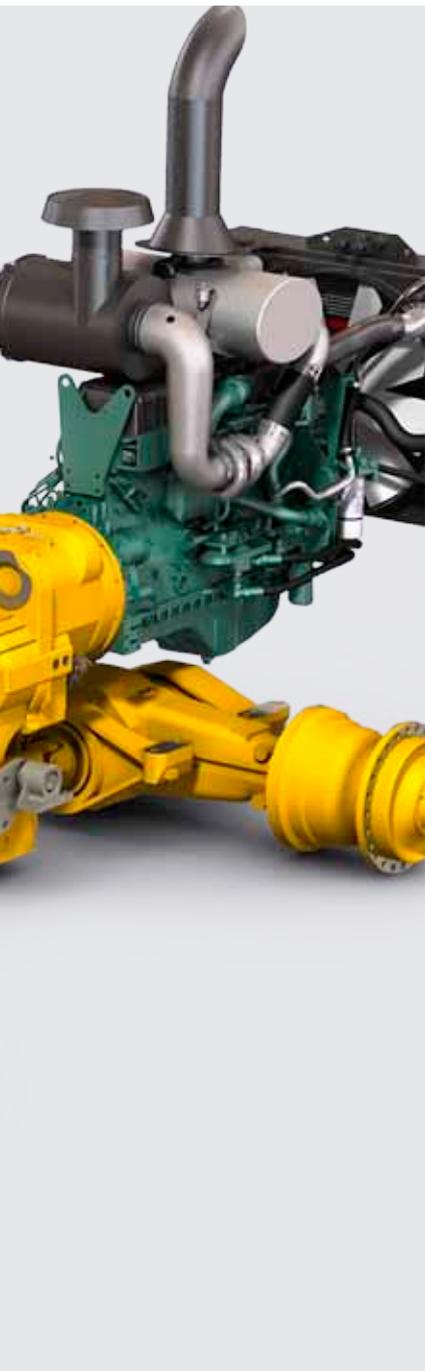
Our engineers have done it again. Once more, we're leading the way with technical advancements that make your business more cost efficient while reducing emissions and environmental impact. Volvo OptiShift is a refinement of Volvo's exceptional APS and driveline concept and includes not only a new torque converter with Lock Up and a free wheel stator, but also the Volvo patented RBB (Reverse by Braking) function for reduced fuel consumption, increased operator comfort, machine durability and shorter cycle times.



# CREATIVITY

- CREATIVITY noun:**
- the skill and imagination to create new things
  - ingeniousness
  - inventiveness





# Fully integrated in the driveline

Volvo OptiShift is an important step forward in our constant quest to dramatically reduce fuel consumption and environmental impact while maintaining productivity, comfort and availability. This advancement is made possible thanks to the integrity and synchronization of a driveline completely designed and constructed by Volvo. OptiShift is fully integrated to function smoothly in a dynamic and powerful unit where all components are perfectly matched to work in harmony.

## **A unique and intelligent solution with many benefits**

Volvo OptiShift includes not one, but two new features: a new torque converter with lock-up and a free wheel stator, and the patented Volvo Reverse by Braking (RBB). Available only from Volvo, this combination offers a number of improvements in Load and Carry applications such as rehandling and timber handling as well as short cycle loading and transport. Enhancements made possible because of Volvo's philosophy that the same machine should be able to handle many different aspects on a jobsite, thereby increasing productivity and profitability.

## **Benefits of OptiShift**

- Reduced fuel consumption in Load and Carry applications and transport
- Higher productivity
- Faster loading cycles
- Increased operator comfort
- Better drive response
- Increased hill climbing performance
- Better deceleration comfort
- Less loading stress on the driveline

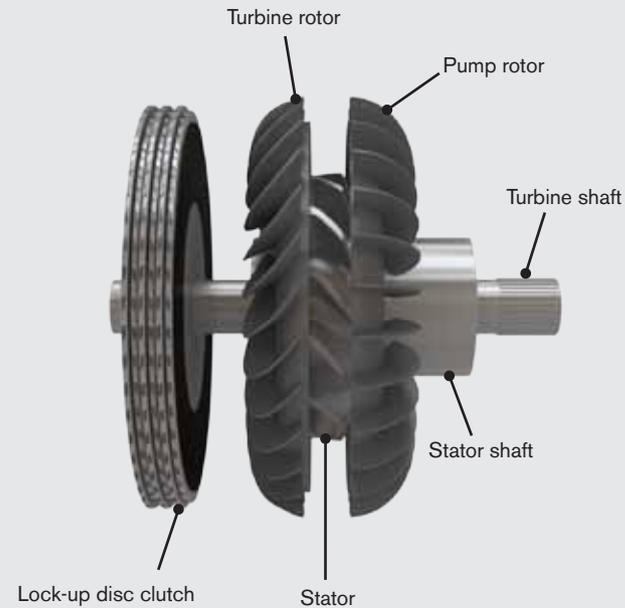


# This is OptiShift

## Torque converter losses eliminated by lock-up and free wheel stator

A torque converter can provide up to two times the input torque from the engine. Needless to say, the torque converter is extremely important to a wheel loader when digging into a pile or accelerating away with a heavy load. Power is hydraulically transferred from the pump rotor to the turbine rotor and on to the transmission. The engine powers the pump rotor that moves oil into the turbine rotor, thereby turning the turbine rotor. The stator acts as a stationary point for the oil, creating leverage. This effect reaches its maximum when the engine rotates the pump rotor without being able to initiate turbine rotor rotation. The down side to a torque converter is that the utilization factor drops from the point where the turbine rotor reaches the same rotation speed as the pump rotor. By adding a drive clutch that mechanically locks the pump rotor and the turbine rotator, losses are eliminated. An OptiShift transmission offers smooth shifting with automatic lock-up in second, third and fourth gear and the operator can switch the lock up function on or off from within the cab.

## Lock-Up



## Typical applications for Lock-Up

- Load and Carry
- Rehandling
- Timber handling
- Uphill
- Transport

## RBB - Reverse by Braking

Fully integrated in the Volvo driveline



# INTELL

#### Typical applications for RBB

- Short Cycle loading
- Aggregate and Quarry
- Waste handling



#### RBB – Reverse by Braking – for smooth deceleration

In short cycle loading it's common to use the gear shifter to change between reverse and forward without applying the brakes. Deceleration is handled by the torque converter in such cases. However, this method is less efficient than braking, results in energy loss and places a lot of strain on the converter due to heat transfer. Volvo's patented RBB is a braking feature that automatically assists machine deceleration by utilizing the standard service brake instead of the torque converter. The operator handles the machine the same way as before, yet upon deceleration using the forward/reverse lever, the RBB recognizes the speed, direction and throttle position and applies the service brake to slow the machine. This provides a smoother deceleration and direction change, and since the converter is no longer used, we save fuel and reduce converter wear.

#### New improved brakes

Although RBB demands a bit more of the brakes, we've solved this by designing new brakes. The new design is based on a sandwich concept with a soft core and harder friction material in the outside layers.

IGENCE

#### INTELLIGENCE noun:

- the ability to comprehend
- to understand and profit from experience
- having the power to bring into being



**HEIDELBERG CEMENT IN BRIEF**

- Founded in Germany in 1873.
- The company employs some 57,000 people at 2,600 locations in around 40 countries.
- Global market leader in aggregates and a prominent player in the fields of cement and concrete.





## “The only thing that matters to us is fuel, fuel, fuel.”

The Heidelberger Sand und Kies gravel company of Germany produces close to a million tons yearly. No wonder fuel consumption tops the list of the many demands the company places on their machines, and why site manager Hans-Jürgen Jeschke is extremely happy with his OptiShift-equipped Volvo L220F.

– Without a doubt, the biggest advantage is the dramatic decrease in fuel consumption, he says. The only thing that matters to us right now is fuel, fuel, fuel.

### **Dependable and efficient machines**

Heidelberg Cement was founded in Heidelberg, Germany in 1873. Today the company is the global market leader in aggregates and a prominent player in the fields of cement, concrete and other downstream activities, making it one of the world’s largest manufacturers of building materials. In northeastern Germany lies one of the company’s many gravel pits, Heidelberger Sand und Kies.

– Our customers are primarily in the concrete industry here in north-east Germany, explains site manager Hans-Jürgen Jeschke. Our products are mainly used in road building and foundation work.

The gravel works uses many machines including an OptiShift-equipped L220F that works with Load and Carry on a transport route of 190 meters. Hans-Jürgen Jeschke says the Volvo machines more than meet all the tough demands the company puts on them.

– Things work great with Volvo, everything from the machine to service and maintenance. The machines are dependable, fast and efficient. Further, it’s important operators enjoy the machine, so they can work safely, comfortably and efficiently during their shift.

### **“OptiShift means smoother shifts”**

Peter Kapost has operated machines for over 30 years and agrees with Hans-Jürgen.

– Volvo machines work really well. The suspension and hydraulics make the machine easy to work with. Shifting is smooth and quiet thanks to RBB and I don’t have to brake when I shift from forward to reverse.

### **“Lock up has reduced fuel consumption by 15%”**

Peter Kapost is excited about lock-up.

– I use it when entering a gravel pile and when I drive the transport route. In addition to being smoother and quieter, it saves fuel. I’m glad we’ve been able to reduce fuel consumption by almost 15 %.

– These are numbers we can be proud of, adds Hans-Jürgen Jeschke. Today, fuel consumption is just about the only thing that counts for us.



**CEMEX IN BRIEF**

- Founded in Mexico in 1906.
- More than 50,000 employees worldwide.
- Produces, distributes, and markets cement, ready-mix concrete, aggregates and related building materials in more than 50 countries.

# “It’s a privilege and pleasure to drive. So smooth”

Cemex Material Ltd. in Peterborough, England is extremely satisfied with its L220F equipped with the new OptiShift feature.

- With the lock-up you can feel the gear shift so smoothly, says operator Harry Calderbank. It’s a privilege and pleasure to drive.

## **Smoother and more efficient**

Cemex Material’s OptiShift equipped L220F works hard, six days a week. With production at 2400 tons a day, the machine is in constant motion having its main task as Load and Carry over a transport route of 100 meters. In other words, the perfect conditions for OptiShift.

- The lock up makes it smoother on the ride, says assistant site manager Ray Bell. Smoother and also more efficient.

## **The RBB is highly appreciated among the operators.**

- It’s very good, says Ray Bell. You can just flick your gear and away you go. Makes work easier and quicker.

## **Fuel reduction by 50 liters a day**

For Cemex Material, OptiShift means not only higher productivity and improved operator comfort, but also a notable reduction in fuel consumption.

- I was using 250 liters a day, says Harry Calderbank. Now we’re using 190-200 liters a day. That’s about 20% or 50 liters a day in savings!





Volvo Construction Equipment is different. Our machines are designed, built and supported in a different way. That difference comes from an engineering heritage of over 175 years. A heritage of thinking first about the people who actually use the machines. About how to help them be safer, more comfortable, more productive. About the environment we all share. The result of that thinking is a growing range of machines and a global support network dedicated to helping you do more. People around the world are proud to use Volvo. And we're proud of what makes Volvo different – **More care. Built in.**

*Not all products are available in all markets. Under our policy of continuous improvement, we reserve the right to change specifications and design without prior notice. The illustrations do not necessarily show the standard version of the machine.*

# **VOLVO**

**Volvo Construction Equipment**  
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PUB 21A1006187  
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Volvo, Global Marketing

English (Global)  
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