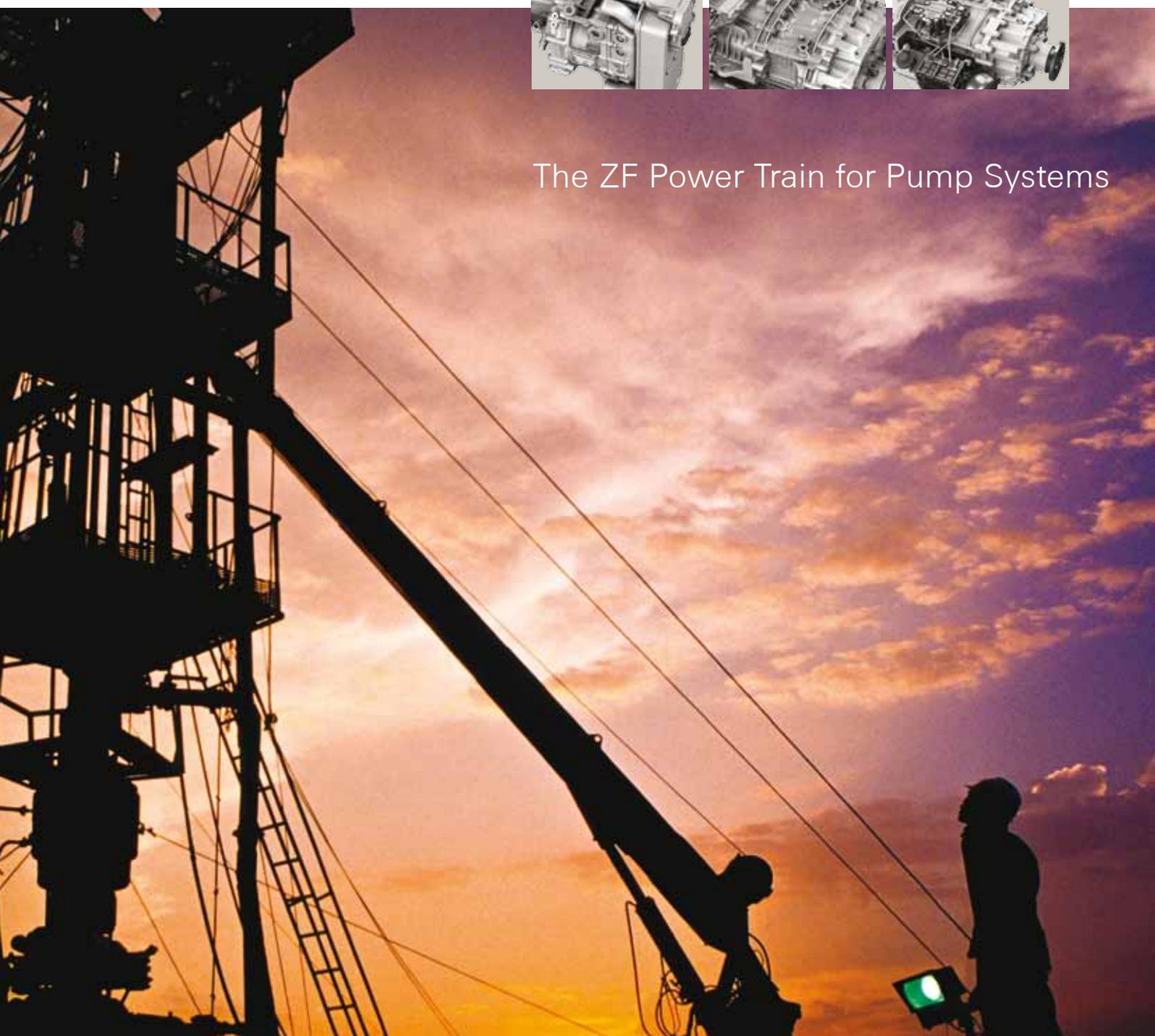




Reliable Technology for Oil and Gas Production



The ZF Power Train for Pump Systems





A motivated and skilled workforce is our most important asset and a decisive success factor at ZF. We offer our employees outstanding opportunities for advancement with regard to their skills, performance, commitment, and mobility. ZF maintains an open dialog with its employees and employee representatives. We proudly work together to make ZF a successful company and view our employees as team members who can be successful only if all work together toward the same goals, throughout all divisions, and across all borders.

We respect the business ethics and legal standards of the countries where we operate. Reliability and fairness are inherent principles of our corporate culture as are honesty and responsibility in all of our actions. We are active members in our communities and maintain a regular dialog with the public. As well, we view our responsibility to social causes, especially environmental protection, among our key corporate goals and seek ways to regularly engage our entire company in their pursuit.



High Reliability

The aim of ZF support is to ensure that everything runs smoothly and is individually tailored for each customer. ZF does not simply supply the transmission, but supports its customers with the installation and transmission adjustment. Both users and the maintenance team are trained on site.

Should additional support be required at some stage, one of the approximately 650 ZF Service Centers is surely nearby.

Simple Handling

The ZF transmission is uncomplicated in every respect and easy to operate for the user due to highly developed technology. It is reliable and robust and withstands the hard day to day work in production or drilling. As it is small, light and compact, the ZF transmission easily fits into the classical pump design consisting of motor, transmission and the triplex pump. All transmission components including the electronics (ECU) are mounted internally and therefore protected from the environment. This is why both installation and cooling are very simple.



Longer Lifespan, Better cost Savings

ZF has the right automatic transmission for every imaginable engine configuration. The lifespan of every ZF transmission can last approximately two times longer than a conventional transmission. With its longer lifespan, you can save more dollars in the daily operations and equipment maintenance costs.

Durability

The ZF transmission is extremely durable and efficient resulting in high levels of productivity. Its tough characteristics enable it to withstand any rough condition, prolonging its durability.

Manual Transmission

ZF is continuously improving its existing systems. The manual transmissions are custom-made with gear steps ranging from five to sixteen, all perfectly adjusted to the performance spectrum of modern engine configuration. The characteristics of these robust transmissions include its minimized noise emission and optimal gear ratios.

The users have to manually select the gear required for optimum pump performance. These transmissions are highly customizable according to the customer's needs, durable and have low fuel consumption. They are of high flexibility and require minimal maintenance, thereby reducing the machine downtimes and operating costs.



Ecomid



Ecosplit

Ecomid

The Ecomid manual transmission system allows vehicles to be put to a wide variety of uses and at the same time, ensuring work efficiency.

The Ecomid transmission has nine speeds and it has a dashboard-compatible shift system that enables shifting to be simple and economical. Its light weight (419 lb / 190 kg) and compact design brings about low installation weight. Ecomid can also be equipped with intertarders and clutch-dependent power take-offs. Ecomid is made for max. input torque of 1,300 Nm (958 lbft).

Ecosplit

A powerful engine and transmission which could transfer power with precision have to be used in order to conquer the difficult terrain and ensuring work efficiency. Ecosplit is the optimum power transmission. It provides the solution to these problems and at the same time, ensuring that goods are delivered quickly, safely and economically.

This lightweight (617 - 706 lb / 280-320 kg) manual transmission features twelve or sixteen speeds, up to 1.991 lbft (2,700 Nm) input torque, allowing drivers to achieve the optimum output, even in the case of vehicles with low-torque engines.

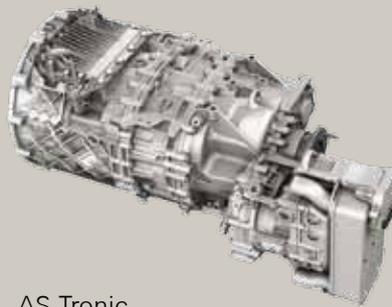
Automated Manual Transmission

ZF transmissions and axle systems are designed for specific application conditions. These drive components ensure maximum performance, cost-effectiveness and comfort. Reliability and user-friendly operation guarantee maximum efficiency.

The success of automated transmission depends largely on its fuel economy. The engines are to be kept in the optimum speed range all the time so that power is transmitted very efficiently to the drive axle which, in turn, saves fuel.



PTO - NMV



AS Tronic



TC Tronic HD

Engine-dependent power take-off (PTO) for ZF transmission (NMV)

The new engine-dependent PTO is particularly attractive for applications which require very high torques for their auxiliary power units, such as concrete pumps or mobile rigs. Like a „sandwich“, the engine-dependent PTO is installed between the engine and the transmission; it has a separate oil sump and cooling circuit.

- Clutch-independent
- One or two PTO locations
- Two designs are available: with an output torque of 737 or 1,475 lbft (1,000 or 2,000 Nm).

AS Tronic / TC Tronic

ZF-AS / TC Tronic generation - synonymous with perfect engine power transfer. Made for applications up to 2,212 lbft / 3,000 Nm (840 HP).

Small, light and compact, at the same time reliable and robust, ZF AS/TC Tronic offers a wide ratio range and enough horsepower for the hard day-to-day work from drilling to cementing to fracturing. Easy to install and operate with options like remote-control, AS/TC Tronic is at home in vehicles or stationary platforms.

Optional adapting systems like our clutch-dependent PTOs or our engine-PTO (NMV) or a Torque Converter in front makes your daily job easier and helps you to improve your productivity.

ZF-AS Tronic / ZF-AS Tronic mid

Model	Numbers of Gears	Max. Horse Power [HP] ¹⁾	Max Input speed min ⁻¹	Max. Input torque [Nm] ¹⁾	Max. Input torque [lbft]	Approx. weight [kg]	Approx. weight [lb]
12 AS 1210	12	330	2,650	1,200	885	200	441
12 AS 1620	12	450	2,650	1,600	1,180	210	463
12 AS 2530	12	700	2,500	2,500	1,843	250	551
16 AS 2630	16	720	2,500	2,600	1,917	270	595
12 AS 3040	12	840	2,500	3,000	2,212	270	595

ZF-TC Tronic HD

Model	Numbers of Gears	Max. Horse Power [HP] ¹⁾	Max Input speed min ⁻¹	Max. Input torque [Nm] ¹⁾	Max. Input torque [lbft] ¹⁾	Approx. weight [kg]	Approx. weight [lb]
12 TC 3041 SO ²⁾	12 + WSK ³⁾	840	2,500	3,000	2,212	560	1,235

ZF-Ecomid / ZF-Ecosplit

Model	Numbers of Gears	Max. Horse Power [HP] ¹⁾	Max Input speed min ⁻¹	Max. Input torque [Nm] ¹⁾	Max. Input torque [lbft] ¹⁾	Approx. weight [kg]	Approx. weight [lb]
ZF-Ecomid 9S 1310	9	350	2,200	1,300	959	190	419
ZF-Ecosplit 16S 2730	16	750	2,200	2,700	1,993	331	729

¹⁾ Reference values

²⁾ 12 TC 3040 SO without Intarder, 500 kg

³⁾ Torque converter clutch

⁴⁾ CAN communication

PTO

These PTOs can be installed upstream of numerous transmissions

Model	Input torque at the PTO [lbft]	Input torque at the PTO [Nm]	PTO position	Shift type	SAE connection	Length [mm]	Length [in]
NMV 2000 L1	1,475	2,000	12 o'clock	Multidisk shift system	SAE 1	210	8.27
NMV 2003 L1	1,475	2,000	3 o'clock	Multidisk shift system	SAE 1	210	8.27
NMV 1075 K1	737	1,000	5 and 7 o'clock	Dog clutch (constant-mesh transmission) shift system	SAE 1	210	8.27

Clutch-dependent drive, ZF-AS Tronic, ZF-AS Tronic mid, ZF-TC Tronic HD

Model	ZF-AS Tronic mid input torque [lbft]	ZF-AS Tronic mid input torque [Nm]	ZF-AS Tronic ZF-TC Tronic HD input torque [lbft]	ZF-AS Tronic ZF-TC Tronic HD input torque [Nm]	Direction of rotation	Speed	Short-term operation ⁴⁾ / continuous operation
NH / 1	590	800	737	1,000	counter-engine-wise	low	■
NH / 4	318	430	318	430	engine-wise	medium	■
N AS / 10	318	430	464 - 265	630-360	engine-wise	low - high	■

Emergency steering pump, ZF-AS Tronic, ZF-AS Tronic mid, ZF-TC Tronic HD, ZF-Ecomid, ZF-Ecosplit

Model	Input torque ¹⁾ [lbft] / [Nm]	Direction of rotation	Speed	Short-term operation ⁴⁾ / continuous operation
N AS/PL	- / -	engine-wise	-	■
N 109 PL (Ecomid) N 221 PL (Ecosplit)	- / -	engine-wise	-	■

Clutch-dependent drive, ZF-Ecomid, ZF-Ecosplit

Model	ZF-Ecomid input torque [lbft]	ZF-Ecomid input torque [Nm]	ZF-Ecosplit input torque [lbft]	ZF-Ecosplit input torque [Nm]	Direction of rotation	Speed	Short-term operation ⁴⁾ / continuous operation
N 71/1	590	800	737	1,000	counter-engine-wise	low	■
N 71/2	221	300	221	300	engine-wise	medium	■
N 71/4	318	430	318	430	engine-wise	medium	■
N 109/10	221 - 464	300 - 630	--	--	engine-wise	low - high	■
N 221/10	--	--	221 - 641	300 - 870	engine-wise	low - high	■

¹⁾ Reference values

⁴⁾ Up to 60 min

- Short-term operation
- Continuous operation



Reliability

ZF. The brand name that stands for on and off-road mobility around the world.

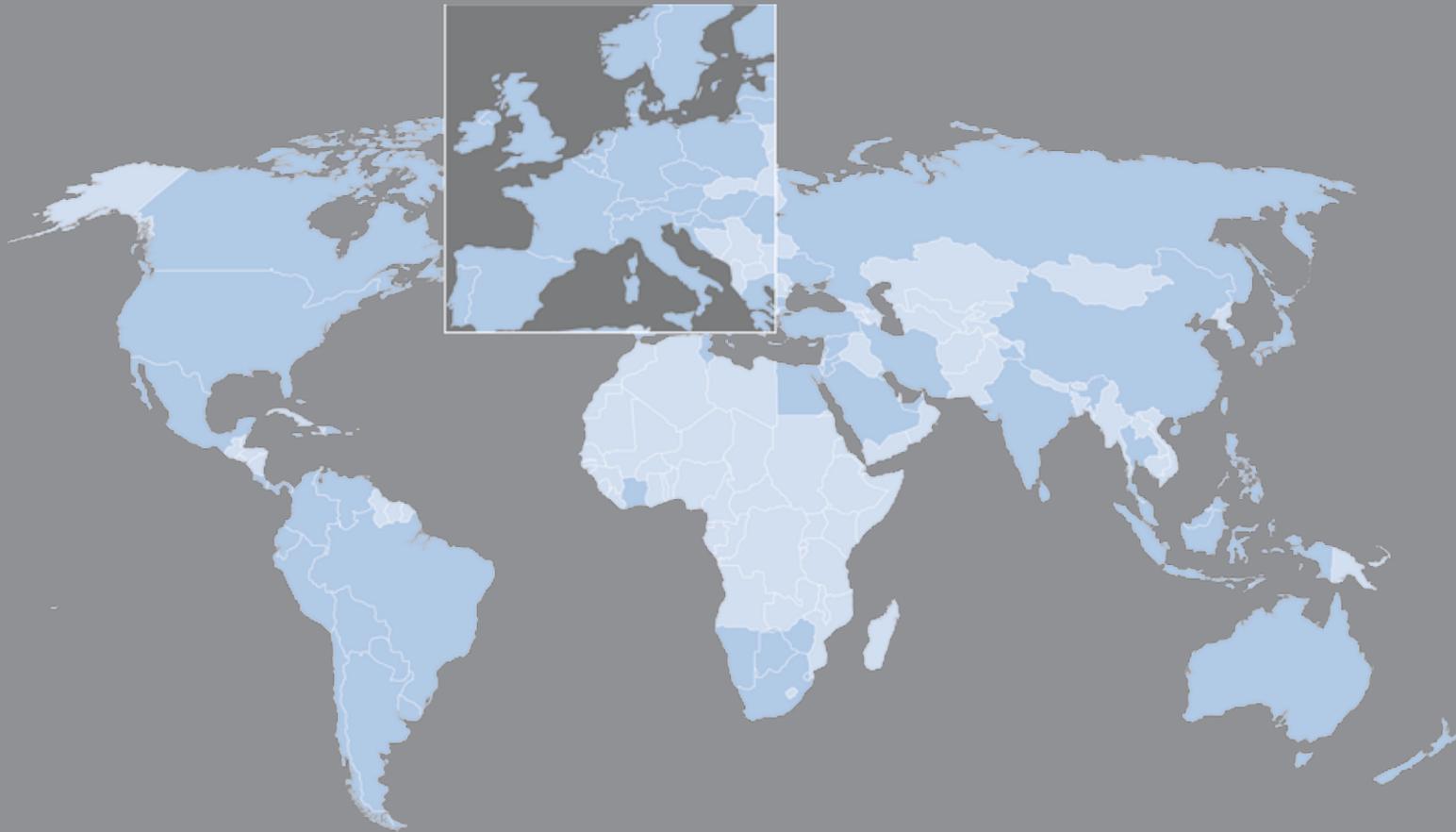
The quality of innovative transmission systems is also a question of experience. For many decades, ZF transmissions have been a major impetus for on and off-road driving and technological progress.

ZF provides comprehensive system solutions all from a single source. The transmission components are perfectly harmonized with one another. The range of available power/performance is, in each case, tailored to the specific demands of the market and manufacturers. The result: every ZF transmission system is a brand name product known for its reliability around the world.

Around the world, around the clock: ZF's service specialists are available anywhere and at any time.



ZF Worldwide:



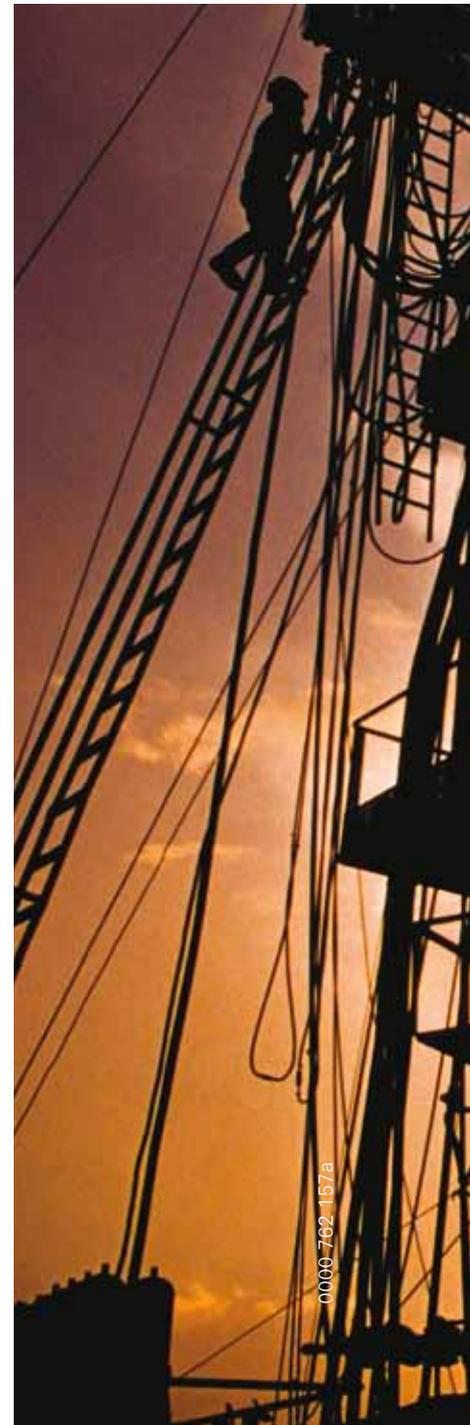
■ Countries with ZF Services locations

Excellentlly networked worldwide:

ZF Services is directly on site with 34 service companies, 5 marketing offices, and 650 service partners worldwide.



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Driveline and Chassis Technology