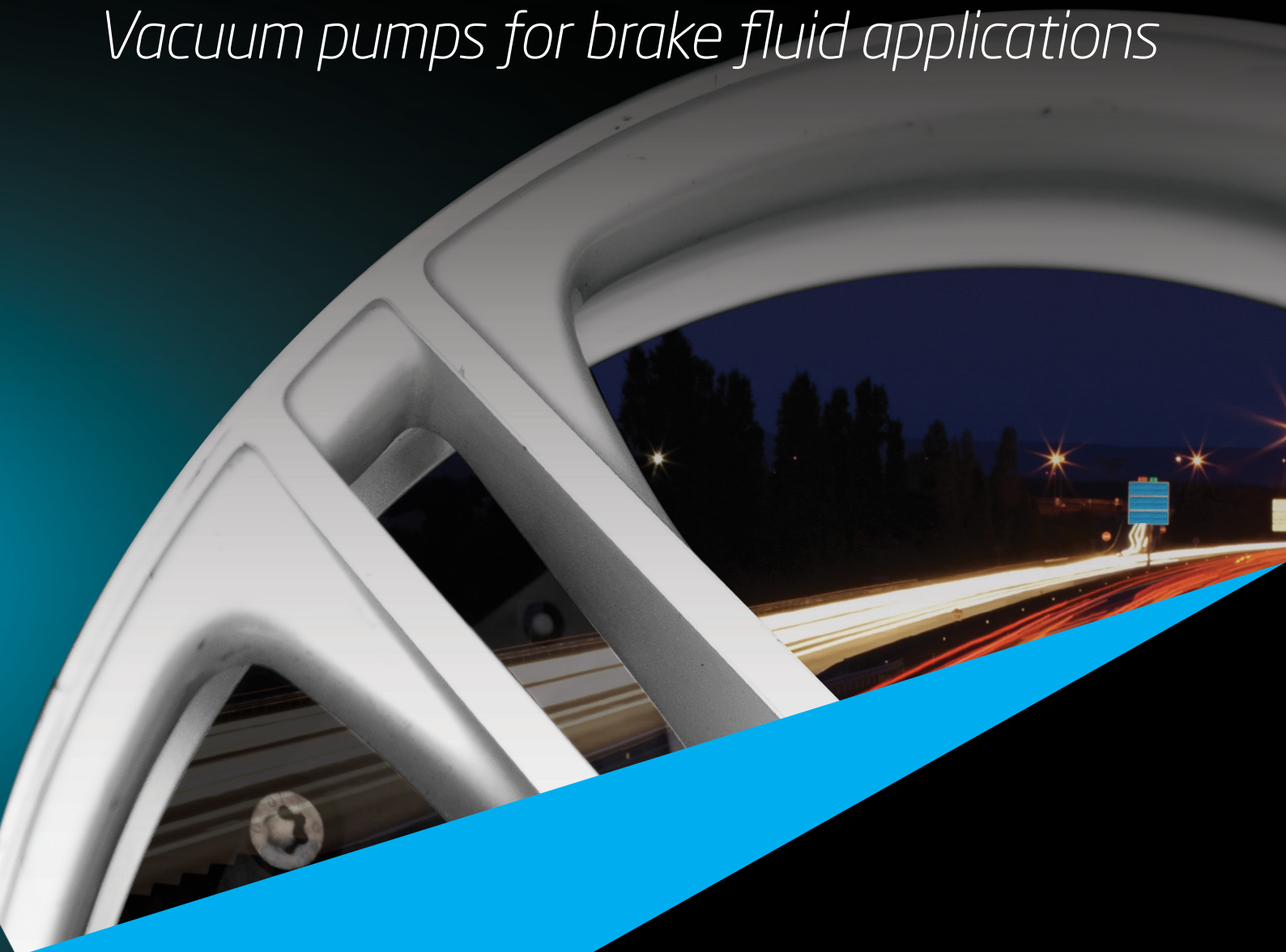


a clear edge

Vacuum pumps for brake fluid applications



 **EDWARDS**

Vacuum science... product solution.

Vacuum and automobiles

Vacuum is an essential part of the automotive manufacturing process industry:

- Brake fluid degassing
- Brake line evacuation and filling
- Leak testing
- Air conditioning refrigerant filling

Vehicle safety - car braking system

One very important aspect of car safety is the braking system of the vehicle.

The use of vacuum systems has been widely practiced in the automotive industry for the purpose of degassing the brake fluid to remove any entrained air bubbles or water vapour and evacuating the brake line before filling it with brake fluid.

Brake Fluid Degassing

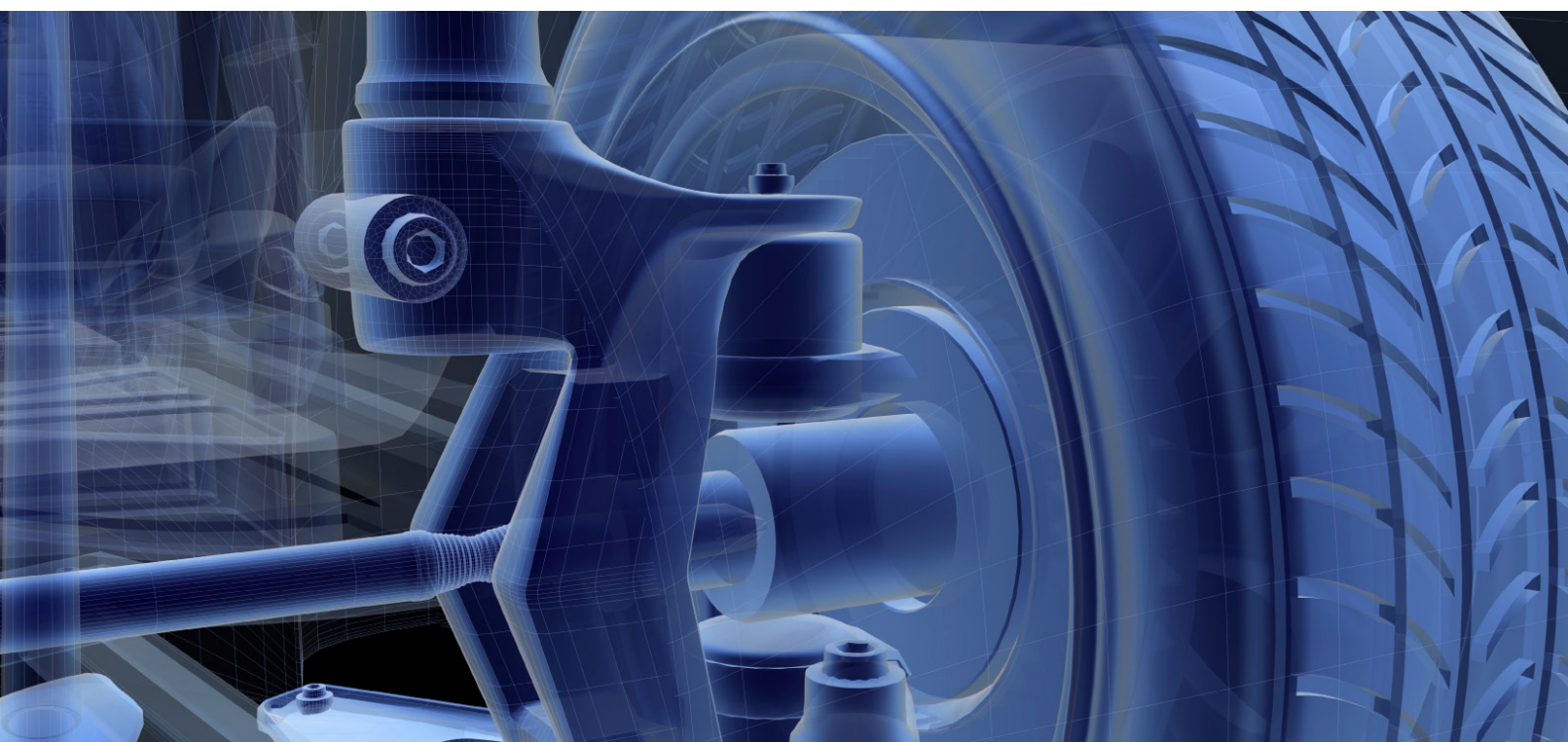
For an efficient and responsive braking system, the braking fluid needs to be free of entrained air bubbles and water vapour as it relies on a single stroke of a piston to force fluid through the system. If any vapour is introduced into the system it will compress, and the pressure may not rise sufficiently to actuate the brakes.

Brake fluid is therefore degassed before use to remove dissolved gas (approximately 10% v/v in the fluid).

Brake Line Evacuation

In order to successfully carry out the scheme of evacuating a brake system and filling it with fluid it is necessary to manage the fluid supply to avoid contamination of the fluid and especially to protect it from contact with atmospheric air.

It is also important to prevent the formation of air bubbles in the fluid when pumping or otherwise transferring the fluid. In the event the fluid, as received, contains air or moisture it is important to remove those contaminants.



Why go dry?

Dry pumping systems provide a clean, totally lubricant free environment among many other advantages over traditional oil sealed vacuum pumps. Edwards offers a range of dry vacuum solutions:

Design	Risk of oil contamination Mineral oil used in pump could contaminate brake fluid	Eliminates risk of brake fluid contamination No oil used
	Risk of oil leaks during oil changes Messy oil leaks could result in contamination and safety hazards	Eliminates messy oil leaks No oil used
	Shaft seal wear This could result in earlier malfunction of pump as well as brake fluid contamination	Eliminates shaft seal wear No shaft seals in pump
	Poor vapour handling Limited ability to pump water vapour during brake fluid degassing	Excellent vapour handling
Maintenance	Regular oil level monitoring required	Eliminates need for oil level monitoring
	Regular oil changes required	Eliminates need to change oil
	Oil filters required	No oil filters used
	Compatible seals required due to use of brake fluid in pump	No special seals required as pump runs dry
	Skilled personnel required for maintenance	Simple on-site maintenance Annual seal change takes only 3 minutes

For single system

The XDS35i is a scroll type vacuum pump providing a clean, dry vacuum, totally free of lubricants. The bearings are isolated from the vacuum environment by a patented bearing shield. Uniquely, there are no bearings, grease or oil under vacuum and no bearing purge is required. Controllable gas ballast is standard and makes the XDS35i suitable for pumping vapours. Even small quantities of condensed liquid are easily handled without problems.

The vacuum performance exceeds that of traditional 16 m³/hr oil sealed vacuum pumps used for this process.

For multi systems

The GV80 is based on our patented multi-stage mechanism which requires no preventive maintenance offering significant cost of ownership savings and increase in productivity.



XDS35i



GV80

Global contacts

Belgium

Brussels +32 2 300 0730

Brazil

Sao Paulo +55 11 3952 5000

China

Shanghai (toll free) 400 111 9618

France

Paris +33 1 4121 1256

Germany

Munich 0800 000 1456

India

Pune +91 20 4075 2222

Israel

Qiryat Gat +972 8 681 0633

Italy

Milan +39 02 48 4471

Japan

Yachiyo +81 47 458 8831

Korea

Bundang +82 31 716 7070

Singapore

Singapore +65 6546 8408

Taiwan R.O.C.

Jhunan Town +886 3758 1000

United Kingdom

Crawley +44 1293 528844

UK (local rate) 08459 212223

United States

Niagara (toll free) 1 800 848 9800