

# Contact Lubrication

## Mechanical Wear

The problems described previously are compounded by the action of the two surfaces rubbing against each other. This occurs in all metal interfaces, whether static or moving. Why static contacts (connectors) suffer from mechanical wear may not be immediately obvious. However, this phenomenon is explained by the fact that connectors and closed contacts are exposed to small amplitude movements caused by vibration, temperature changes etc. These small movements are known as 'fretage'.

As the surfaces fret, friction causes metal particles to be removed from the peaks breaking through plated surfaces. This exposes surface and underlying metal to effects of oxidation and wear. Additionally the detached metal particles can cause intermittent signal transmission and ultimately switch failure.

A lubricated switch is subject to far less mechanical wear as the lubricant facilitates smooth movement. Friction is therefore greatly reduced, as is wear, extending switch lifetime.

## Feel Characteristics

The way a switch 'feels' when operated has become an indicator of quality particularly within the automotive industry. Contact lubricants, in addition to their technical benefits can also determine the 'feel' of a switch, whether it be strong and decisive for the dashboard of a commercial vehicle, or smooth and quiet for a luxury car.

## Silicone Contamination

Silicone contamination poses particular problems which can also be overcome by contact lubricants. Silicones can be found in mechanical lubricants, sealants, polishes and mould release agents.

As silicones can "creep" great distances, these products should not be used in switch assembly areas. When silicone is present between moving or vibrating contacts, they react under arcing conditions to form silicon carbide. These crystals abrade the contact surface and cause electrical breakdown.

If a contact lubricant is used on the switch prior to the introduction of silicone these problems are avoided.

## Conclusion

Electrolube range of contact lubricants has been developed to improve the efficiency and life-span of switches and connectors.

However, it is important to discuss options with Electrolube at the design stage to ensure that the correct product is selected and properly applied. Among the areas to be considered are voltage, current, operating temperature range, contact metals, number of cycles and associated plastics.

Typical Properties	SGA 2G	SGB 2GX	CG52B	CG53A	CG60	CG70	CG71	EGF	EPC	Plastics Lubricant	
										SPG	LCG
Colour	Light Brown	Light Brown	Beige	Cream	Cream	Cream	Cream	White	Red	Light Brown	Cream
Pour Point (base oil, °C IP-15)	-46	-37	-45	-37	-54	-57	-56	-25	-46	-57	-52
% Evaporation Weight Loss between 24 and 150hrs (IP-183 100°C)	0.9	0.93	0.84	0.21	0.3	0.3	0.3	<0.1	0.9	0.2	0.3
Fliessdruck (mbar, -40°C, DIN 51805)	650	720	400	350	300	300	300	1100	N/A	450	300
Drop Point (°C IP-31)	>250	>250	>230	200	200	200	200	>250	>250	>250	200
Penetration (Worked, Cone, 20°C IP-50)	320	320	320	320	330	320	310	270	320	320	320
Temperature Range (°C)	-40 → +125	-35 → +130	-45 → +130	-35 → +130	-45 → +130	-55 → +130	-50 → +130	-25 → +300	-50 → +250	-50 → +130	-45 → +130
Mechanical Lubrication	Good	Good	Good	Excellent	Excellent	Excellent	Excellent	Good	Good	Excellent	Excellent
Electrical Performance	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Good	Good	Fair	Excellent
Oil Version Available	SOA	SOB/EML	N/A	SOB/EML	N/A	N/A	N/A	EOF	N/A	N/A	N/A
Plastics Compatibility Polycarbonate *	Poor	OK	OK	OK	Excellent	Excellent	OK	Excellent	N/A	Excellent	Excellent
Plastics Compatibility ABS *	Poor	OK	OK	OK	Excellent	Excellent	OK	Excellent	N/A	Excellent	Excellent

\*Compatibility may differ from quoted results - Testing should always take place prior to production.

12.5 & 25Kg drums are straight sided and therefore suitable for automatic dispensing.  
12.5Kg: 254mm inside diameter x 330mm height 25Kg: 305mm inside diameter x 406mm height.