Biolubricants

The application of biolubricants in company vehicles

Hydraulic systems are used on heavy vehicles such as: lorries, buses, agricultural machines, refuse-lorries and other company vehicles. The fluids in a hydraulic system maintain the pressure regulation, which can increase up to several hundred bars. This causes risks of hose ruptures or leakage. An estimated 20% - 30% of all sold hydraulic fluids end up in the environment. (SenterNovem, 2007).

The lubrication points or lorries and buses are lubricated with semiliquid greases. This does not concern circulation systems, but total loss lubrication. Regular maintenance of vehicles is important; oil leakage rarely occurs in engines that are in good condition. An important measure to decrease the environmental impact during use is the improvement of the quality of the vehicle's parts. By reducing the number of parts that need replacement, oil consumption can be decreased. By using biolubricants, damage to the environment through leakage loss or total loss lubrication is reduced.

Table one shows the number of commercial vehicles in the Netherlands (with applications such as Automatic Lubrication Systems and hydraulic systems) and gives an idea of the potential use of biolubricants in this application. Over the last five years, the number of commercial vehicles has increased on the whole. Within the 'bus' category no distinction was made between public transport and other buses. Likewise, it is unknown which of the other commercial vehicles were owned, managed or rented by the Dutch government.

Table 1: Motor vehicles; total overview per period and based on technical features

				Vehicle age	Total age			
Subject				Periods	1-1-2010	1-1-2009	1-1-2008	1-1-2007
Total vehicle fleetk	Total amount of vehicles			*amounts*	10396746	10288216	10067576	9835793
	Total amount of passenger cars				7622353	7542331	7391903	7230178
	Commercial vehicles	Total amount of commercial vehicles			2150951	2140281	2090469	2037704
		Commercial motor vehicles	Total amount of commercial motor vehicles		1094211	1101432	1082523	1064846
			Delivery vans		872355	876170	862303	849348
			Lorries		73368	75112	75313	75841
			Tractors		71560	74624	72786	70544
			Special vehicles		65294	64194	61030	58268
			Buses		11634	11332	11091	10845
		Trailers and semitrailers	Total amount of trailers and semitrailers		1056740	1038849	1007946	972858
			Trailers		924118	905955	881919	853482
			Semitrailers		132622	132894	126027	119376
	Total amount of motorcycles				623442	605604	585204	567911

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Over the past few years, the number of buses has remained stable at about 11,000. Public transportation companies pay attention to environmental aspects of maintenance products (such as coolant, batteries, tires and soap), but there is very little use of biolubricants. Mineral synthetic oil is used as engine oil. After 30,000-40,000 kilometres, this oil needs to be replaced, collected and processed. The number of lubrication points and consumption decreases; the consumption is small compared to the engine oil consumption, but it is total loss lubrication. Suppliers estimate the consumption of grease at 10 kilos a year per bus. That would mean that by way of their lubrication points, all Dutch buses together emit 110 tonnes of grease directly into the environment every year.

In European Green Public Procurement documents (for transport) it is recommended, among other things, to collect and process used oil separately. An additional requirement could be inserted in the clauses of passenger car lease contracts and in the agreements with public transport, refuse collection and other heavy vehicles to the effect that on maintenance a minimum of 25% rerefined base oil should be used.

In the past the use of biolubricants in public transport has been discussed, but one problem is that the manufacturers of engines and gear boxes offer no guarantees when biolubricants are used. This renders the use of biolubricants unattractive to the owner. Suppliers have taken initiative to introduce biolubricants to the transport industry (among other things via public transport companies). Data on the use of biolubricants in practice are usually not registered centrally. Therefore, good insight into the current use of biolubricants is lacking.

Staatsbosbeheer, the Dutch equivalent of the forestry commission, has about a 130 two-axle tractors and about a 100 single-axle tractors (garden tractors with cutter bar). In addition, twoaxle tractor construction equipment is being used. These are forestry-related, such as front-end loaders, tree clamps and planting machines but also chiefly hay harvest machines such as mowers, (hay) tedders, loader wagons, round balers etc. Many machines have some hydraulic and/or greased parts. The hydraulic fluid and grease consumption is estimated at 7,200-8,400 litres a year. It is hard to estimate the amount of grease used on axles and coupling. In the past rapeseed oil was used as a base oil for hydraulic fluids. Now vegetable-based synthetic esters are used.

The Dutch Staatsbosbeheer's purchasing of biological products has not been standardised. However, the use of biodegradable chainsaw oil has been mandatory for years. There have been consultations with suppliers on the introduction of a coherent package of biological products for tractors and equipment.

Suspicions and fear of technical malfunctions and of higher costs hinder the introduction of biobased products. Equipment is often hired from mechanization and contracting firms. The exchange of equipment poses a risk when different products are applied -and mixed- during maintenance. The switch to biolubricants should be made under steady supervision. An important part of the Dutch Staatsbosbeheer's policy is the cultivation of positive experiences and the removal of doubt by monitoring the quality of the hydraulic fluids in tractors in particular. Furthermore, research is being done into the possible prolonging of oil life span by added fine filtration techniques. By monitoring the quality of the oil you can get an idea of the maximum life span per type of equipment and application. If a longer life span proves possible, this compensates for the higher costs of biolubricants. The Dutch Staatsbosbeheeris doing a trial run of this scheme in their Flevoland district.