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(54) **ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS**

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(57) **ABSTRACT**

An ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, contains glycol, corrosion inhibitors and antifoaming agents, and must be diluted in water, either before or after it is fed into the hydraulic system, including shock absorber, preferably in a concentration of 30% to 70% by volume of the composition and of 30% to 70% by volume of water.

ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS

[0001] This invention patent is related to a new composition of lubricant fluid for hydraulic systems, including shock absorbers, which should be diluted in water, resulting on an environment friendly, biodegradable, antifreezing fluid, keeping all physical and chemical features critical to its good work in compliance with the safety and good performance technical standards.

[0002] As known by the technique, fluids for hydraulic systems (among them, fluids for shock absorbers) available in the market have, in their composition and as their main component, mineral base oil or a mix of mineral base oils.

[0003] However, the biodegradability of those components is considered low, i.e, "not easily biodegradable", so the elimination of that material has to be performed as per CONAMA resolution 362.

[0004] It is an aim of this invention to produce a lubricant fluid composition with biodegradability higher than the products currently available in the marketing and that can thereafter be sent to treatment stations for products considered as "easily biodegradable", being therefore eliminated in a way other than that established in the aforementioned resolution.

[0005] It is another aim of this invention to obtain a lubricant fluid that works at the lowest temperatures (below −45° C.), a factor that makes this product a universal use product, avoiding the need for stocking several others products.

[0006] For such, according to this invention, this innovated lubricant fluid composition comprises:

[0007] a) a higher amount of glycol, such as monoethylene glycol; monopropylene glycol; diethylene glycol; dipropylene glycol; and other glycols; the glycol aims to give the fluid (and product) biodegradability, lubricant and antifreezing features; due to its biodegradability features, the fluid can be sent to treatment stations for products considered as "easily biodegradable" and may be universally utilized because it also works at low temperatures (even below −45° C.)

[0008] b) a smaller amount of wear inhibitor, such as packets with organic salt, triazoles and surfactants packets, sodium nitrite, packets with inorganic salt, triazoles, chelants and tensioactives, sodium benzoate, borax, amines, amides, citric acid, dodecanedioic acid; the wear inhibitors aims to avoid hydraulic system wear due to the water in the system at operation conditions considered regular.

[0009] c) an antifoaming, silicone-free combination of hydrocarbons, vegetable fatty acids and glycols; silicon fluid; dimethicone; polydimethylsiloxane; polydimethylsiloxane water solutions; the antifoaming is to avoid the foaming resulting from air intake in the system during work regimen; foam causes lubricant failures and therefore should be avoided.

[0010] This innovated composition should be diluted in water, previously or in the hydraulic system, including shock absorber, preferring at 30% to 70% volume of this composition and 30% to 70% volume of water.

[0011] The subject of this Invention Patent is an "ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS", soluble in water, at concentrate form, comprising:

[0012] a) glycol, such as monoethylene glycol; monopropylene glycol; diethylene glycol; dipropylene glycol; and other glycols; at 89.970% to 99.699% mass rate, 94.994% preferred;

[0013] b) wear inhibitor, such as packets with organic salt, triazoles and surfactants packets, sodium nitrite, packets with inorganic salt, triazoles, chelants and tensioactives, sodium benzoate, borax, amines, amides, citric acid, dodecanedioic acid; at 0.3% to 10.0% mass rate, 5.0% preferred;

[0014] c) antifoaming; such as hydrocarbon packet, vegetable fatty acids and glycols, free from silicon; silicon fluid; dimethicone; polydimethylsiloxane; polydimethylsiloxane water solution; with 0.001% to 0.030% mass rate, 0.006% preferred.

[0015] This innovated lubricant fluid composition may be provided in concentrate form for dilution in water or already diluted, such dilituion preferably occurring at 30% to 70% volume of this composition and 30% to 70% volume of water.

[0016] This innovated lubricant fluid has the following working and performance specifications, i.e, the following physical and chemical features: clear visual aspect; colorless to light yellow; cinematic viscosity from 2 cSt to 10 cSt at 100° C.; total solubility in water; 90° C. minimum flash point; minus 45° C. maximum flow point; and 2 mg KOH/g maximum acidity index.

1. ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, characterized by being soluble in water and comprising: a) Glycol at 89.970% to 99.699% mass rate, 94.994% preferred; b) wear inhibitors at 0.3% to 10,0% mass rate, 5.0% preferred; c) antifoaming at 0.001% to 0.030% mass rate, 0.006% preferred.

2) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by the glycol being monoethylene glycol; monopropylene glycol; diethylene glycol; dipropylene glycol; and other glycols.

3) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by wear inhibitors being packets with organic salt, triazoles and surfactants packets, sodium nitrite, packets with inorganic salt, triazoles, chelants and tensioactives, sodium benzoate, borax, amines, amides, citric acid, dodecanedioic acid.

4) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by the antifoaming being hydrocarbon packet, vegetable fatty acids and glycols, free from silicon; silicon fluid; dimethicone; polydimethylsiloxane; polydimethylsiloxane water solution.

5) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by including water as solvent, at the preferred concentration of 30% to 70% volume of this composition and 30% to 70% volume of water.

6) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claims **1**, characterized by the water being previously added to the composition or added later, directly in the hydraulic system.

7) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by cinematic viscosity from 2 cSr to 10 cSt at 100° C.

8) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by 90° C. minimum flash point.

9) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by 45° C. maximum flow point.

10) ECOLOGICAL, BIODEGRADABLE, FLUID LUBRICANT AND ANTI-FREEZING COMPOSITION FOR HYDRAULIC SYSTEMS, according to claim **1**, characterized by 2 mg KOH/g maximum acidity index.

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