

## GOVERNMENT OF ZAMBIA

STATUTORY INSTRUMENT NO. 32 OF 2011

**The Standards Act**

(Laws, Volume 23, Cap. 416)

**The Standards (Compulsory Standards)  
(Declaration) Order, 2011**

IN EXERCISE of the powers contained in section *seven* of the Standards Act, the following Order is hereby made:

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| <p>1. This Order may be cited as the Standards (Compulsory Standards) (Declaration) Order, 2011.</p> <p>2. The Standards set out in the First Schedule are hereby declared as compulsory standards.</p> <p>3. The Standards set out in the First Schedule shall apply to the respective commodities listed in the Second Schedule.</p> | <p>Title</p> <p>Declaration of compulsory standards</p> <p>Application of standards</p> |
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## FIRST SCHEDULE

*(Paragraph 2)*

## COMPULSORY STANDARDS

## ZAMBIA BUREAU OF STANDARDS

Zambian Standard	<b>ZS 547 Part 1: 2011</b>
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**LUBRICATING OILS - Specification****Part 1: Automotive Gear Oils**

1. *Scope*
  - 1.1 This Zambian Standard specifies requirements for automotive and manual transmissions, transaxles and axles operating under a variety of conditions of speed, load and gear types.
  - 1.2 The automotive gear oil acceptance criteria, in terms of quality and performance level, shall be primarily based on the API service designation. These are based on the type of service in which the gear oil will be used.

2. *Note*

<b>AGMA</b>	American Gear Manufacturer's Association
<b>API</b>	American Petroleum Institute
<b>ASTM</b>	American Society for Testing and Materials
<b>cP</b>	centi Poise
<b>COC</b>	Cleveland Open Cup
<b>eSt</b>	centi Stokes
<b>SAE</b>	Society of Automotive Engineers

**ZS**            **Zambians Standards**

**3. NORMATIVE REFERENCE**

In this Standard, reference has been made to the following standards:

<b>ASTM D92/IP 36</b>	Test method for flash and fire points by Cleveland Open Cup (COC).
<b>ASTM D130/IP 154</b>	Test method for detection of copper corrosion from petroleum products by the copper strip test.
<b>ASTM D2270/IP 226</b>	Standard practice for calculating viscosity index from kinematic viscosity at 40°C and 100°C.
<b>ASTM D 2983</b>	Test method for low-temperature viscosity of automotive fluid lubricants measured by the BrookField Viscometer.
<b>ASTM D97/IP 15</b>	Pour point method.
<b>ZS 371</b>	Road tank vehicles for petroleum based flammable liquids-specification.
<b>ZS 385</b>	The Petroleum Industry: Part 1 - Storage and distribution of petroleum products in above ground bulk installations-Code of Practice.
<b>ZS 396</b>	Sampling petroleum products: Part 1 - manual sampling of liquid hydrocarbons.

**4. DEFINITIONS**

For the purpose of this Standard, the following definitions apply:

**4.1 Additive**

A compound added to engine oil to enhance properties and performance.

**4.2 ASTM method**

The test method published by the American Society for Testing and Materials, in the United States of America.

**4.3 ASTM reference sequence**

The reference test sequence given in STP 315H, published by the American Society for Testing and Materials in the United States of America.

**4.4 Automotive**

Equipment associated with self-propelled machinery usually vehicles driven by internal combustion engines.

**4.5 Base oils**

Refined additive-free oils of varying viscosity grades, which are used in the manufacture of formulated lubricants.

**4.6 Category**

A designation such as API GL-1 or API GL-5 for a given level of performance in specified field tests.

**4.7 Classification**

The systematic arrangement into categories according to different levels of performance in specified field tests.

**4.8 Gear oil**

A liquid that reduces friction and wear between the moving parts within a power transmission system, serves as a coolant and may contain additives to enhance its performance and inhibit rusting, oxidation and foaming.

**4.9 IP Method**

The test method published by the Institute of Petroleum in the United Kingdom.

#### 4.10 SAE service classification

The internal combustion engine service classification as defined in SAE J183, published by the Society of Automotive Engineers in the United States of America.

### 5. REQUIREMENTS

#### 5.1 General

5.1.1 The API service categories based on an open-ended alphanumeric gear lubricant designations (API GL1, API GL2, API GL3, API GL4 and API GL5) shall apply.

5.1.2 A marketeer shall ensure that each licenced automotive gear oil satisfies all bench testing performance requirements as stipulated in the claimed API service category and those in Table 1 and Table 2 of this Standard, and in selecting a particular lubricant, the user is to take into account recommendations of the equipment manufacturer.

#### 5.2 Licensed Service Category

5.2.1 The recommended automotive gear oil shall comply with the requirements of API GL-4 and API GL-5.

5.2.2 A marketeer of automotive gear oil marketed in Zambia shall ensure that the automobile gear oil has a product data sheet which, apart from other proprietary information, shows all the details listed in Table 1 and 2 together with the corresponding properties.

### 6. PACKAGING AND MARKING

#### 6.1 Packaging

The condition of selling or transporting oil containers shall be such as not to be detrimental to the quality of the oil during normal storage or transportation and shall comply with the provisions and requirements of the following standards:

**ZS 371** Road tank vehicles for petroleum based flammable liquids - specification.

**ZS 385** The Petroleum Industry: Part 1 Storage and distribution of petroleum products in above ground bulk installations - Code of Practice.

#### 6.2 Marking

The following information shall appear in legible and in delible marking on an automotive gear oil containers apart from other proprietary information:

- (a) product brand name;
- (b) manufacturer's name;
- (c) SAE Viscosity grade;
- (d) API service category;
- (e) Intended application;
- (f) quantity contained in litres or kilogrammes as applicable;
- and
- (g) safety, health and environmental information.

### 7. SAMPLING

Sampling shall be done in accordance with the provisions given in ZS 396 and ASTM D4057.

**TABLE 1: REQUIREMENTS FOR AUTOMOTIVE API GL-4 GEAR OILS**

SAE Viscosity Grade	SAE GRADE	75W	80W	75W/90	80W/90	90	85W/140	140
Product Identity	Not Applicable	Brand	Brand name					
Viscosity at 100°C	ASTM D445/IP71	4.1 Min.	7.0 Min.	13.5 Min.	13.5 Min.	13.5-24.0	13.5-24.0	24.0-41.0
Viscosity	ASTM	90 Min.	90 Min.	90 Min.	90 Min.	90 Min.	90 Min.	90 Min.
Flash Point (COC)	ASTM D92/IP36	144 Min	190 Min	178 Min	200 Min.	200 Min.	200 Min.	200 Min.
Pour Point (°C)	ASTM D97/IP 15	-24	-24	-24	-24	-24	-24	-24
Copper Corrosion	ASTM D130/IP	2C Max	2C Max	2C Max	2C Max	2C Max	2C Max	2C Max

**TABLE 2: REQUIREMENTS FOR AUTOMOTIVE API GL-5 GEAR OILS**

TEST	TEST METHOD	REQUIREMENTS						
		75W	80W	75W/90	80W/90	90	85W/140	140
SAE Viscosity Grade	SAE GRADE							
Product Identity	Not Applicable	Brand name	Brand name	Brand name	Brand name	Brand name	Brand name	
Viscosity at	ASTM D445/IP71	4.1 Min.	7.0 Min.	13.5 Min.	13.5 Min.	13.5-24.0	24.0 Min.	24.0-41.0
Viscosity Index	ASTM D2270/IP226	90 Min.	90 Min.	90 Min.	90 Min.	90 Min.	90 Min.	90 Min.
Flash Point (COC), °C	ASTM D92/IP36	200 Min.	200 Min.	200 Min.	200 Min.	184 Min.	200 Min.	200 Min.
Pour Point (°C)	ASTM D97/IP 15	-21	-21	-21	-21	-21	-21	-21
Viscosity of 150,000	ASTM D2983	-40	-26	-40	-26	-	-26	-
Copper Corrosion	ASIM D130/IP 154	2C Max	2C	2C	2C	2C	2C	2C

**ZAMBIA BUREAU OF STANDARDS****Zambian Standard****ZS 547 Part 2: 2011****LUBRICATING OILS - Specification****Part 2: Industrial Gear Oils for Open Gears****I. Scope**

1.1 This Zambian Standard specifies requirements for open gear lubricants to be used for various methods of applications to the general industrial helical, herringbone, spur and bevel open gears.

1.2 The open gear lubricants acceptance criteria shall primarily be based on the performance criteria stipulated by the American Gear Manufacturers Association. Reference will also be made to other institutions such as the International Organisation for Standards and the American Society for Testing and Materials.

1.3 The industrial gear oil shall be a mineral oil blended with additives to provide the requisite level of oxidation and thermal stability, rust and wear protection, demulsibility and foam inhibition for application intended.

1.4 This Zambian Standard applies only to semi enclosed and open gearing systems, where associated bearings are lubricated separately.

**2. Note**

<b>AGMA</b>	American Gear Manufacturer's Association
<b>API</b>	American Petroleum Institute
<b>ASTM</b>	American Society for Testing and Materials
<b>COC</b>	Cleveland Open Cup
<b>SAE</b>	Society of Automotive Engineers
<b>eStcenti Stokes</b>	
<b>cP</b>	centi Poise
<b>EP</b>	Extreme Pressure
<b>ISO</b>	International Organisation for Standardisation
<b>ISO VG</b>	International Organisation for Standardisation Viscosity Grade
<b>PMCC</b>	Pensky Martens Closed Cup

**3. NORMATIVE REFERENCES**

In this Standard, reference has been made to the following standards:

<b>ASTM D88</b>	Test method for determination of sayboilt viscosity of petroleum products.
<b>ASTMD92/IP 36</b>	Test method for flash and fire points by Cleverland Open Cup (COC).

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<b>ASTMD93/IP 34</b>	Test method for flash point of petroleum products by Pensky - Martens Closed Cup (PMCC).
<b>ASTM D130/IP 154</b>	Test method for detection of copper corrosion from Petroleum Products by the copper strip tarnish test.
<b>ASTMD445/IP 71</b>	Test method for kinematic viscosity of transparent and opaque liquids (the calculation of dynamic viscosity).
<b>ASTMD665/IP 135</b>	Test method for rust preventing characteristics of inhibited mineral oil in the presence of water.
<b>ASTM D892</b>	Test method for foaming characteristics of lubricating oils.
<b>ASTM D943</b>	Test method for oxidation characteristics of inhibited mineral oils.
<b>ASTM D2270/IP 226</b>	Practice for calculating viscosity index from kinematic viscosity at 40°C and 100°C.
<b>ASTM D2711</b>	Test method for demusibility characteristics of lubricating oils.
<b>ASTM D2893</b>	Test method for oxidation characteristics of extreme pressure lubricating oils.
<b>ASTM D4057</b>	Standard practice for manual sampling of petroleum and petroleum products.
<b>ZS 371</b>	Road tank vehicles for petroleum based flammable liquids -specification.
<b>ZS 385</b>	The Petroleum Industry: Part 1 - Storage and distribution of petroleum products in above ground bulk installations -Code of Practice.
<b>ZS 396</b>	Sampling petroleum products: Part 1 - manual sampling of liquid hydrocarbons.

#### **4.0 DEFINITIONS**

For the purpose of this Standard, the following definitions apply:

##### **4.1 Additive**

A compound added to engine oil to enhance properties and performance.

##### **4.2 ASTM method**

The test method published by the American Society for Testing and Materials in the United States of America.

##### **4.3 ASTM reference sequence**

The reference test sequence given in STP 315H, published by the American Society for Testing and Materials.

**4.4 Base oils**

Refined additive-free oils of varying viscosity grades, which are used in the manufacture of formulated lubricants.

**4.5 FZG**

Forschungstelle für Zahnrad und Getriebbau (Research Institute for Gears and Gear Design, Germany).

**4.6 Gear oil**

A liquid that reduces friction and wear between the moving parts within a power transmission system, serves as a coolant, and may contain additives to enhance its performance and inhibit rusting, oxidation and foaming.

**4.7 AGMA Lubricant Number**

Numbering as defined in AGMA 251.02, published by the American Gear Manufacturers Association.

**4.8 R and O Gear oils**

Petroleum-based oils with rust and oxidation inhibitors (R and O)

**4.9 EP Gear Oils**

Gear oils that contain additives which prevent sliding metal surfaces from seizing under extreme pressure conditions.

**4.10 IP method**

The test method published by the Institute of Petroleum, United Kingdom.

**5. REQUIREMENTS****5.1 General**

**5.1.1** AGMA Lubricant based on an open-ended alphanumeric gear lubricant designations (AGMA 1 to AGMA 13, inclusive for R and O Gear Oils and AGMA 1EP to AGMA 13EP for EP Gear Oils) shall apply.

**5.1.2** A marketer shall ensure that licensed open gear oil satisfies all bench testing performance requirements as stipulated in Table 1 to 4 of this standard and in selecting a particular lubricant, the user must take into account recommendations of the equipment manufacturer.

**5.1.3** A manufacturer in the food and drug industry who uses lubricants recommended in this standard in food and drug industry applications shall ensure that accidental contact of the lubricant, with the products being manufactured is avoided.

**5.2 Licensed Service Category**

A marketer of open gear oil marketed in Zambia shall ensure that open oil has a product data sheet which, apart from other proprietary information, shows all the details listed in Tables 1, 2, 3 and 4, together with the corresponding properties.

**6. PACKAGING AND MARKING****6.1 Packaging**

The condition of selling or transporting oil containers shall not be detrimental to the quality of the oil during normal storage or transportation and shall comply with the provisions and requirements of the following standards:

**ZS 371** Road tank vehicles for petroleum based flammable liquids-specification.

**ZS 385** The Petroleum Industry: Part 1-Storage and distribution of petroleum products in above ground bulk installations-Code of Practice.

**6.2 Marking**

The following information shall appear in legible and indelible marking on open gear oil container's apart from other proprietary information:

(a) product brand name;

(b) manufacturer's name;

(c) ISO viscosity grade, or AGMA lubricant number or ASTM equivalent grade;

(d) intended application;

(e) quantity contained in litres or kilogrammes as applicable;

(f) safety, health and environmental information.

**7. SAMPLING**

Sampling shall be done in accordance with the provisions given in ZS 396 and ASTM D4057.

## ZS 547 Part 2: 2011

Table 1 - AGMA Viscosity Grades for Open Gear Lubricants

AGMA Lubricant Number		ASTM Equivalent Grade	Corresponding ISO Viscosity	Viscosity Ranges in cSt @ 37.8 Deg C
R and O Gear Oils	EP Gear Oils			
4	4EP	S700	150	135 to 165
5	5EP	S1000	220	198 to 242
6	6EP	S1500	320	288 to 352
7	7EP	S2150	460	414 to 506
8	8EP	S3150	680	612 to 748
9	9EP	S7000	1500	1350 to 1650
10	10EP	S15000	—	2880 to 3520
11	11EP	S21500	—	4140 to 5060
12	12EP	S31500	—	6120 to 7480
13	13EP	S150000	—	25600 to 38400

Table 2 - Specification for R and O Gear Oils

Property	Test Procedure	Criteria for Acceptance
Viscosity	ASTM D88	Must be as specified in Table 1
Viscosity Index	ASTM D2270/IP226	* 90 min
Oxidation stability	ASTM D943 number of	Hours to reach a neutralisation 2.0mg KOH: AGMA Grade Hours (Min 1 and 2 1 500 3 and 4 750 5, 6,7 and 8 500
Rust Protection	ASTM D 665/IP 135	AGMA Lubricant Nos. 4 to 8 - no rust after 24 hours with synthetic sea water
Corrosion Protection	ASTM D 130/IP 154	*#1 strip after 3 hours at 121 Deg °C
Foam Suspension	ASTM D 892	*Must be within the limits specified in Table 4
Demulsibility	ASTM D2711	*Must be within the limits specified in Table 4
Cleanliness	None abrasives	Must be free from grit and

\* Applicable to AGMA Lubricant Nos. 4 to 8 only

**Table 3 - Specification for EP Gear Oils**

Property	Test Procedure	Criteria for Acceptance
Viscosity	ASTM D88	Must be specified in Table 1
Viscosity Index	ASTM D2270	*90 min
Oxidation stability	ASTM D2893	*Increase in Kinematic viscosity of oil sample @ 99 (°C) degrees should not exceed 10 percent
Rust Protection	ASTM D665	No rust after 24 hours with distilled water
Corrosion Protection	ASTM D130	*# 1 strip after 3 hours at 99 degrees (°C)
Foam Suspension	ASTM D892	*Must be within the limits specified in Table 4
Demulsibility	ASTM D2711	*Must be within the limits specified in Table 4
EP Property	Tim ken Test	An oil which passes either a 20Kg Timken OK load or 9 stages on the FZG machine is considered acceptable
Additive Solubility	None	Must be filterable to 100 microns (wet or dry) without loss of EP additive

\*Applicable to AGMA Lubricant Nos. 4EP to 8EP only

Table 4 - Test Procedures and Limits

1.0 Test Limits - ASTM D892 Foam Test			
	Temperature	Max Volume of Foam (ml) After	
		5 Minutes Blow	10 Minutes Rest
Sequence I	24 °C	75	10
Sequence II	93 °C	75	10
Sequence III	24 °C	75	10

2.0 Test Limits - ASTM D2711 Demulsibility Test	
Max percent water in the oil after 5 - hour test	0.5%
Max cuff after centrifuging	2.0ml
Min total free water collected during entire test	30ml

3.0 Test Limits - ASTM D2711 Demulsibility Test (Modified for EP oils para.3.2., ASTM D2711 -69)		
	AGMA Grades	
	2 EP to 6 EP	7 EP to 8 EP
Max percent water in the oil after 5 - hour test	1.0%	1.0%
Max cuff after centrifuging	2.0ml	4.0ml
Min total free water collected during entire test (Start with 90ml. of water)	60ml	50ml

**ZAMBIA BUREAU OF STANDARDS**

Zambian Standard

**ZS 547 Part 3: 2011****LUBRICATING OILS - Specification****Part 3: Industrial Gear Oils for Enclosed Gears****1. Scope**

- 1.1** This Zambian Standard specifies requirements for mineral gear oils suitable for enclosed gears operating at various speeds and shock loadings.
- 1.2** The industrial gear oil shall be a mineral oil blended with additives to provide the requisite level of oxidation and thermal stability, rust and wear protection, demulsibility and foam inhibition for the intended application.
- 1.3** Industrial gear oil acceptance criteria in terms of quality and performance level shall primarily be based on the performance criteria stipulated by original equipment manufacturers such as David Brown and by institutions such as AGMA, ISO, Croft and US Steel.

**2. NOTE**

<b>AGMA</b>	American Gear Manufacturer's Association
<b>API</b>	American Petroleum Institute
<b>ASTM</b>	American Society for Testing and Materials
<b>DIN</b>	Deutsches Institute für Normung (German Standards Institute)
<b>SAE</b>	Society of Automotive Engineers
<b>API</b>	American Petroleum Institute
<b>ISO</b>	International Organisation for Standardisation
<b>SABS</b>	South African Bureau of Standards
<b>eSt</b>	centi Stokes
<b>mgKOH/g</b>	milligrammes of potassium hydroxide per gramme of oil

**3. NORMATIVE REFERENCES**

In this Standard, reference has been made to the following standards:

<b>ASTM D92/IP 36</b>	Test method for flash and fire points by Cleveland Open Cup (COC).
<b>ASTM D445/IP 71</b>	Test method for kinetic viscosity of transparent and opaque liquids (the calculation of dynamic viscosity).
<b>ASTM D2270/IP 226</b>	Practice for calculating viscosity index from kinematic viscosity at 40°C and 100°C.
<b>ASTM D97/IP 15</b>	Test method for pour point of Petroleum Product.
<b>ASTM D 664</b>	Total acid number of petroleum products by potentiometric titration.

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<b>ASTM D665/IP 135</b>	Test method for rust preventing characteristics of inhibited mineral oil in the presence of water.
<b>ASTM D892/IP 146</b>	Test method for foaming characteristics of lubricating oils.
<b>ASTM 943</b>	Test method for oxidation characteristics of inhibited mineral oils.
<b>ASTM D2270/IP 226</b>	Practice for calculating viscosity index from kinematic viscosity at 40°C and 100°C.
<b>ASTM D2893</b>	Test method for oxidation characteristics of extreme pressure lubricating oils.
<b>ASTM D4057</b>	Standard practice for manual sampling of petroleum and petroleum products.
<b>DIN 51354/IP334</b>	Load carrying capacity test for oils - FZG Gear machine
<b>ZS371</b>	Road tank vehicles for petroleum based flammable liquids -specification.
<b>ZS385</b>	The Petroleum Industry: Part 1 - Storage and distribution of petroleum products in above ground bulk installations -Code of Practice.
<b>ZS 396</b>	Sampling petroleum products: Part 1 - manual sampling of liquid hydrocarbons.

#### 4. DEFINITIONS

For the purpose of this Standard, the following definitions apply:

##### 4.1 Additive

Material added to engine oil to enhance properties and performance.

##### 4.2 ASTM method

The test method published by the American Society for Testing and Materials.

##### 4.3 ASTM reference sequence

The reference test sequence given in STP 315H and published by the American Society for Testing and Materials.

##### 4.4 Base oil

Refined additive-free oil of varying viscosity grades, used in the manufacture of formulated lubricants.

##### 4.5 Compounded Gear Oil

Oil marked 'Comp' and compounded with 3% to 10% fatty or synthetic fatty oils.

##### 4.6 Gear oil

A liquid that reduced friction and wear between the moving parts within a power transmission system, serves as a coolant, and may contain additives to enhance its performance and inhibit rusting, oxidation and foaming.

##### 4.7 Extreme Pressure Additive

Lubricant additive that prevents sliding metal surfaces from seizing under extreme pressure conditions.

**4.8 FZG**

Forschungstelle für Zahnrad und Getriebbau (Research Institute for Gears and Gear Design Germany).

**4.9 IP method**

Test method published by the Institute of Petroleum in the United Kingdom.

**5. REQUIREMENTS****5.1 General**

**5.1.1** Industrial Gear oils shall comply with the requirements detailed in Table 1 and Table 2.

**5.1.2** An industrial gear oil shall not contain any lead additives.

**5.1.3** A marketer shall ensure that all industrial gear oil marketed in Zambia has a product data sheet which, apart from other proprietary information, contains all the details listed in Table 1 and Table 2 together with the corresponding properties.

**6. PACKAGING AND MARKING****6.1 Packaging**

The condition of selling or transporting oil containers shall be such as not to be detrimental to the quality of the oil during normal storage or transportation and shall comply with the provisions and requirements of the following standards:

ZS 371 Road tank vehicles for petroleum based flammable liquids - specification.

ZS 385 The Petroleum Industry: Part 1 - Storage and distribution of petroleum products in above ground bulk installations - Code of Practice.

**6.2 Marking**

All industrial gear oil containers shall bear apart from other proprietary information the following details:

(a) product brand name;

(b) manufacturer's name;

(c) quantity contained in litres; and

(d) safety, health and environmental information.

**7. SAMPLING**

Sampling shall be done in accordance with the provisions given in ZS 396 and ASTM D4057.

TABLE 1: MINIMUM REQUIREMENTS FOR EP INDUSTRIAL GEAR OIL

TEST	TEST METHOD	REQUIREMENTS							
		68	100	150	220	320	460	680	1000
ISO VG	Not Applicable	68	100	150	220	320	460	680	1000
AGMA	Not Applicable	2 EP	3 EP	4 EP	5 EP	6 EP	7 EP	8 EP	8AEP
CROFT Designation	Not Applicable	B	C	D	E	F	G	-	-
David Brown Number	Not Applicable	2	3	4	5	6	7	8	9
Product Identity	Not Applicable	Brandname	Brandname	Brandname	Brand name	Brand name	Brandname	Brandname	Brandname
Viscosity at 40°C, cST	ASTM D445/IP 71	61.2-74.8	90-110	135-165	198-242	288-352	414-506	612-748	900-1100
Viscosity Index (min)	ASTM D 2270/IP 226	90	90	90	90	90	90	90	90
Pour Point, °C (max)	ASTM D97/IP 15	27	24	22	20	18	9	6	3
Flash Point (CO C), °C (min)	ASTM (COC), °C (min)	200	200	200	200	200	200	200	200
Total Acid Number, KOH/g (max)	ASTM D 664/IP 177	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5mg
FZG failure load stage (min)	ASTM D 51354/IP 334	>12	>12	>12	>12	>12	>12	>12	>12
Rust Prevention	ASTM D665/IP 135	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass



Foaming Characteristics									
Sequence I (max)	ASTM D892/P 146	10/0	10/0	10/0	10/0	10/0	10/0	10/0	10/0
Sequence II (max)	50/0	50/0	50/0	50/0	50/0	50/0	50/0	50/0	50/0
Sequence III (max)	10/0	10/0	10/0	10/0	10/0	10/0	10/0	10/0	10/0
Oxidation	ASTM D2893	Increase in kinematic viscosity of oil sample at 95°C should not exceed 10% stability							
Oxidation Stability	ASTM D943	Hours to reach a neutralisation number of 2.0							
		ISO VG				Hours (Min)			
		46, 68				1,500			
		100,150				750			
		220,320				500			

Note:

Oils marked 'Comp' are compounded with 3% to 10% fatty or synthetic fatty oils

## SECOND SCHEDULE

(Paragraph 3)

1. ZS 547 PART 1: Lubricating oils - automotive gear oils
2. ZS 547 PART 2: Lubricating oils - industrial gear oils for open gears
3. ZS 547 PART 3: Lubricating oils - industrial gear oils for enclosed gears

F. MUTATI,  
Minister of Commerce,  
Trade and Industry

LUSAKA

11th March, 2011