

# MAK TO-4

## Description

These are transmission oils for off highway equipment meeting the newer Caterpillar TO-4 Power shift transmission specification.

Powershift transmissions reduce operator fatigue and increase the life of machine components as the selection of gear ratios is done by moving lever & no clutch operation required. There are internal clutches, applied hydraulically which route the power through gear sets to output shafts. Hence, the frictional properties of oil are very critical.

MAK TO-4 oils are formulated with superior quality base oils and additive technology developed exclusively for Caterpillar equipment. These oils significantly provide improved transmission performance over TO-2 oils.

## Application

Recommend for use in newer Cat equipment friction devices, power shift transmissions, clutches, brakes and in other equipment drive train components like final drives, bevel gears and differentials. Also suitable for use in the older Cat equipment.

## Benefits

- Superior frictional characteristics & efficiency
- Excellent anti-wear, protection
- Enhanced oxidation stability
- Longer transmission life

## Performance Level

- Caterpillar TO-4
- Allison C-4
- ZF TE ML 03/01

## Technical Specifications

Description	Method of Test ASTM	MAK TO-4 SAE 10W	MAK TO-4 SAE 30	MAK TO-4 SAE 50
Density at 15°C, g/cm <sup>3</sup>	D 1298	0.879	0.8876	0.8889
Flash Point, COC, °C	D 92	232	234	248
Pour Point, °C	D 97	-27	-12	-9
Kinematic Viscosity, mm <sup>2</sup> /s (cSt)	D 445			
40°C		36.92	95.64	193.5
100°C		5.9	10.77	17.5
Viscosity Index	D 2270	102	96	97
Foaming characteristics, ml	D 892			
1st time: 24°C		0-0	0-0	0-0
2nd time: 93.5°C		10-0	10-0	10-0
3rd time: 24°C		0-0	0-0	0-0

All the mentioned values are typical which may vary from batch to batch.

## Storage and Handling

- Indoor Storage is always preferable
- Barrels should be kept horizontally with bunk position at 3 O'clock 9 O'clock position
- Barrels should be kept away from dusty or heated areas.
- During handling any contact with dust must be avoided

## Health & Safety

This grade is not hazardous under normal conditions of use. For further guidance Material Safety Data Sheet (MSDS) may be referred.

## Advice

For any further advice on applications or otherwise, please contact the nearest Bharat Petroleum territory office or Technical Services department at the address given below.

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