

**REPORT**  
**No. D4-TPT 351-051-86**

Commissioned by Petrolon (UK) Ltd.  
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Product trade name: Slick 50

**1. Purpose of the tests**

According to the customers instructions, the effect of "Slick 50" when added to normally available engine and gear oils with regard to the reduction of fictional losses as well as related changes in fuel consumption and exhaust gas emissions should be established.

**2. Test vehicle**

Manufacturer	Ford (Germany)	Model name	Granada 2.3
Type	GU	Chassis No.:	GAGFUG 39020
First registered	27.02.80	Max. engine power	79/5000 kW/min

**3. Tests conducted**

- 3.1. Check of the idling setting of the engine
- 3.2. Fuel consumption measurement - DIN 70030 (ECE-R 15/04 Annex 9)
- 3.3. Coast-down on the dynamometer
- 3.4. Exhaust gas measurement - ECE-Regulation 15/04

**4. Measuring equipment and test devices**

- 4.1. Motor tester from Robert Bosch, Compact Test
  - motor tester MOT 500
  - ignition oscilloscope MOT 400
  - report printer PDR 100
  - pressure and vacuum tester EU 007.01

- 4.2. Dynamometer from Schenck, Type 500/GS 60  
Prod. No. LNB 0729, LEG 1417 diameter of rollers 502 mm  
max. power 60 kW Max. speed 200 km/h

- 4.3. Exhaust gas analyser: Horiba, CVS-61-2  
Analysors MEXA 8420 Typ AIA 23, AIA 23 (AS), FIA 52, CLA 53, MPA 21

- 4.4. CO measuring device: ULTRAMAT 13 P with NDIR analysors

**5. Procedures carried out on the test vehicle**

To establish the original values, all the tests listed under(3) above were first carried out with the original oils still in the vehicle. The engine settings at idle were found to be in accordance with the manufacturers specifications (Motor Data).

Following this, the engine, gear-box and differential oils were replaced with oils to which Slick 50 was added according to the manufacturer's instructions.

engine oil: 3.50 l Valvoline All climate 10W40-0.75 l Slick 50  
(red pack 750 ml for 4-stroke engines 1.6-3.5 l)

gear-box: 1.50 l Castrol EP 80- 0.50 l Slick 50  
(blue pack 500 ml for gear-box and differential treatment)

differential 1.30 l Castrol Hypoy 90 +0.50 l Slick 50 (blue pack)

After a running-in period of about 2750 km, all tests listed under (3) above were repeated.

To avoid as far as possible external factors influencing the test series, as far as possible the tests were conducted with the same engine settings, with adjustments being made as necessary. Also, new oil and air filters and new spark plugs were fitted, and the engine idling speed was set back before the start of the second series of tests from 900 mm to 800 min.

For the duration of the tests the bonnet was plumbed, and the oil filler holes were sealed with sealing paint

After about 1500 km of the running-in period had elapsed, about 0.6 l of motor oil was needed to top up; after the further 1250 km a further 0.3 l was required. The seals were on both occasions found to be undamaged.

In spite of extensive elimination of factors which could have led to a distortion of the test results, the figures in (6) below include the inevitable spread resulting from the practical tolerances present in the test drives and their measurement. The figures in (6) can therefore, because of the lack of complete statistical certainty involved, not be taken as absolute. However, the possible spread in the measurements is smaller than the computed changes which were established during the second series of tests.

## 6. Test results

	base values (normal oil)	'after' values (+Slick 50)	change (%)
Speedo reading, km	46950	49700	
Idling settings of the engine			
- idle speed (min)	820	800	
- motor oil temperature (°C)	93	94	
- CO-concentration (Vcl %)	1,6	1,53	
Fuel consumption (l/100 km)			
-city cycle	13,91	13,22	—4,96
-90 km/h	7,82	7,41	—5,24
- 120 km/h	9,91	9,54	—3,73
-average (DIN 70030)	10,6	10,1	—4,7

## 6. Test results

	base values (normal oil)	'after' values (+Slick 50)	change (%)
time to coast down on the test rig from V=100 km/h to v=20 km/h (average from 2 measurements)	45,93	54,70	+19,1
exhaust values in the ECE-Test (average from 2 measurements)			
- CO (g/test)	41,72	48,40	+16,0
- HC (G/test)	12,78	12,31	— 3,7
- NO (g/test)	7,79	6,25	—19,8
- HC+NO <sub>x</sub> (g/test)	20,57	18,55	— 9,8

## 7. Summary of results

The reduction of the frictional losses in the test vehicle are evidenced most clearly by the considerably longer coast-down time (19.1%) on the test rig. They gave an improvement in fuel consumption of 4.7% in the ECE mix. The changes in the exhaust gas emissions come less from the use of Slick 50 than from the vehicle and/or motor settings. They fall more or less within the scatter area expected in such measurements. However, the reduction in nitrous oxides emissions can be attributed - at least by inference - to the lower frictional losses in the engine through the use of Slick 50.

There were further tests made, beyond the main scope of this report which brought no negative results; among these were for example, an investigation for possible fluorine or other acidic combinations in the Slick 50- treated engine and gear-box oils, and in the exhaust gases, which could have been undesirable for the environment or for the vehicle.

When the spark-plugs were changed before each series of tests, the compression of the cylinders was measured. While the peripheral measurements - such as the battery voltage - were not made, which would have allowed an unrestricted confirmation of the readings taken, the improvement measured - about 7.5 psi per cylinder- infers an improvement in the sealing of the cylinders.

In summary, it is confirmed that the tests described above under sections 3-6 showed a measurable reduction in the frictional losses of the test vehicle through the addition of Slick 50 to the engine, gear box and back axle oils. No negative effects resulted from the treatment.