

OIL RECOMMENDATIONS

RECOMMENDED GRADES OF OIL

NOTE: The oil companies listed below are or will be shortly marketing lubricants to meet International Standards Organisation (ISO) method of classification.

To meet this requirement Shell, Esso and BP have suffixed viscosity numbers as part of the brand name, this number represents the oil viscosity measured at 40°C. Mobil have not added a viscosity number but for identification and comparative purposes and also as an aid to ordering, the grade number has been added in brackets.

Until March 1978, **SHELL** oils should be ordered by their former oil grade numbers.

CF Type Carter Drives

GRADE 'H'

Hot conditions site temp 30°C (86°F) – 43°C (110°F)

Shell Companies	Shell Tellus Oil 68 (formerly Tellus Oil 33)
Mobil Oil Company Ltd	Mobil DTE Oil Heavy/ Medium (VG. 68)
Esso Petroleum Company Ltd	Teresso 68
BP Oil Ltd	BP Energol HLP 68

GRADE 'N'

Normal conditions site temp 13°C (55°F) – 30°C (86°F)

Shell Companies	Shell Tellus Oil 46 (formerly Tellus Oil 29)
Mobil Oil Company Ltd	Mobil DTE Oil Medium (VG. 46)
Esso Petroleum Company Ltd	Teresso 46
BP Oil Ltd	BP Energol HLP 46

GRADE 'L'

Cold conditions site temp 2°C (35°F) – 13°C (55°F)

Shell Companies	Shell Tellus Oil 37 (formerly Tellus Oil 27)
Mobil Oil Company Ltd	Mobil DTE Oil Light (VG. 32)
Esso Petroleum Company Ltd	Teresso 32
BP Oil Ltd	BP Energol HLP 32

CA, CAM and CAL Type Carter Drives

GRADE 'A'

Hot conditions site temp 30°C (86°F) – 43°C (110°F)

Shell Companies	Shell Tellus Oil 150 (formerly Tellus Oil 69)
Mobil Oil Company Ltd	Mobil DTE Oil Extra Heavy (VG. 150)
Esso Petroleum Company Ltd	Teresso V150 or Teresso 150
BP Oil Ltd	BP Energol HP 150

GRADE 'B'

Normal conditions site temp 13°C (55°F) – 30°C (86°F)

Shell Companies	Shell Tellus Oil 100 (formerly Tellus 41)
Mobil Oil Company Ltd	Mobil DTE Heavy (VG. 82)
Esso Petroleum Company Ltd	Teresso 100
BP Oil Company Ltd	BP Energol HLP 100

GRADE 'C'

Cold conditions site temp 2°C (35°F) – 13°C (55°F)

Shell Companies	Shell Tellus Oil 68 (formerly Tellus Oil 33)
Mobil Oil Company Ltd	Mobil DTE Oil Heavy/ Medium (VG. 68)
Esso Petroleum Company Ltd	Teresso 68
BP Oil Ltd	BP Energol HLP 68

Flange Mounted 'Ritespeed' Gear Units

Standard oils equivalent to Renold Ltd (Crofts Gear Works) Grade 'F'

Shell Companies	Vitrea Oil 320 (formerly Vitrea Oil 75)
Mobil Oil Company Ltd	Mobil DTE Oil AA (VG. 320)
Esso Petroleum Company Ltd	Teresso 320
BP Oil Ltd	BP Energol CS 320

Worm Gear Units

For recommended grades of oil for use with worm gear units, refer to Sheet WG/08.

Carter hydrostatic infinitely variable speed drives of all types incorporate fine clearance bush type journal bearings which also function as oil distributing valves, and power transmitting pistons which fit closely in their mating cylinders. The very nature of their functions necessitates that they allow the minimum of oil leakage past their working clearances but are satisfactorily lubricated when working under high or low oil pressures, high or low rubbing speeds and over a reasonable range of working temperatures. Also contained in the mechanisms are ball journal bearings which may run over a wide range of speeds together with rotating and sliding control motions moving at relatively low speeds; their adequate lubrication is an essential requirement if the best service and life is to be obtained. Test bed experiments have shown that the drives are tolerant to quite wide variations in oil characteristics, but considerable industrial application experience has also shown that the advantage gained from the use of *correctly selected high quality mineral oils*, refined and blended specifically for use in hydraulic power transmissions, more than offsets their extra cost.

The table below shows the approximate mean characteristics of the oils which are considered to be suitable for use with the types of drives specified, within the ambient temperature bands listed. The characteristics of oils produced by different companies will not conform exactly to the characteristics listed but most reputable suppliers can meet the specifications within fairly close tolerances.

It will be noted that the use of higher viscosity oils is advocated for use at higher ambient temperatures in order to help to provide the required viscosity characteristics at the working surfaces. This, however, cannot provide for the increased rate of oil deterioration which must inevitably occur at increased temperatures and for such conditions the use of oils containing anti-oxidant additives is most strongly recommended.

The instructions sent out with every Carter drive contain recommendations regarding frequency of oil change which are satisfactory for the average application. Local representatives of oil suppliers will advise whether more or less frequent changes will be desirable for particular application conditions such as extremes of temperature, exceptional humidity, corrosive atmospheres, etc.

High Viscosity Index oils are specified in order to minimize the change in viscosity between cold starting and settled running temperature conditions, but oils with Special Viscosity Index improving additives are *not* normally recommended since these additives are consumable and unless oil maintenance is adequate this can result in a considerable loss of viscosity. Such oils should only be used on the direct recommendation of oil manufacturers.

OIL CHARACTERISTICS

Ambient Temperature °C	Kinematic Viscosity Centistokes C/S		Viscosity index (min)	* Pour point °C
	40°	100°		
CF Type Drives				
2 – 13	32	5,5	95	-15
13 – 30	46	7,1	95	-15
30 – 43	68	8,8	95	-15
CA, CAM & CAL Type Drives				
2 – 13	68	8,8	95	-15
13 – 30	100	11,7	95	-12
30 – 43	150	15,0	95	-12

The pour point temperatures listed are not maximum, but higher figures are not desirable, particularly if cold starting conditions are likely.

DESIRABLE ADDITIVES

Anti-oxidant, anti-rust and low pour point additives are considered to be desirable in all the grades of oil listed, as they give increased protection against the effects of unfavourable atmospheric, loading, temperature and oil maintenance conditions. All oils should be free from mineral acid and alkali, grit, water, suspended matter or other contaminants.

Care must be taken to ensure that additives having adverse effects upon white metal bearings and yellow metal components are not contained in any oil selected.

OIL RECOMMENDATIONS

APPROXIMATE OIL QUANTITIES

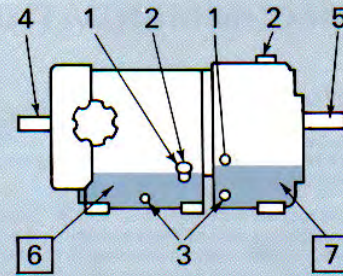
Before any attempt is made to run a Carter drive, fill with clean oil of the correct grade to the correct level (see notes and diagrams). It is essential that at the initial and subsequent fillings every precaution is taken to ensure that no grit or dirt enters the oil sumps.

When installing combined Carter drives and flange mounted 'Ritespeed' gear units it is important to remember that these have SEPARATE OIL SUMPS and for correct working require DIFFERENT GRADES OF OIL.

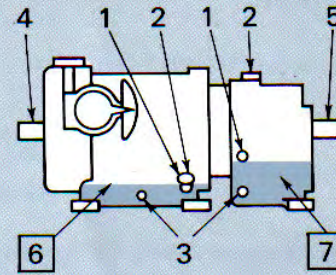
Oil Quantities

Carter drive	Oil capacity (approx)	Associated 'Ritespeed' unit	Oil capacity (approx)
	litres		litres
CF10	1,15	OCS	1,15
		OCB	1,15
		OCT	1,15
CF12	1,70	1 DNRS	1,70
		1 DNRD	1,70
		1 CDRT	2,25
CF13	3,15	5 SFRD	2,85
		5 CFRT	2,85
CF14	4,55	5 SFRD	4,00
		5 CFRT	4,00
CA3	4,00	5 SFRD	4,00
		5 CFRT	4,00
CA4	4,55	5 SFRD	5,70
		5 CFRT	5,70
		7 BD	2,25
		7 BT	2,85
CAM26	8,50	7 SFRD	1,70
		9 BD	2,85
		7 BT	2,85
		9 BT	4,00
CA5	8,50	9 BS	2,85
		7 BD	2,25
		9 BD	2,85
		9 BT	4,00
CA6	11,50	10 BS	3,40
		9 BD	2,85
		10 BD	3,40
		10 BT	5,70
CAM42	32	10 BS	3,40
		12 BS	5,10
		10 BD	3,40
		12 BD	5,10
		10 BT	5,70
12 BT	11,50		
CAL50	82	—	—

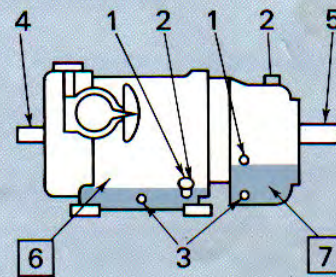
CF Type Drive



CA Type Drive



CA and CAM Type Drive

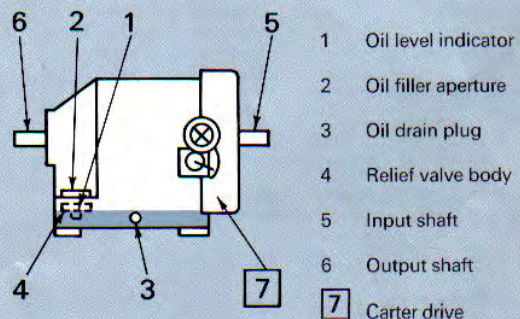


- 1 Oil level indicators
- 2 Oil filler apertures
- 3 Oil drain plugs
- 4 Input shaft
- 5 Output shaft
- 6 Carter drive
- 7 'Ritespeed' unit

For CF, CA and CAM type drives, the correct oil level is the lip of the oil filler aperture.

For 'Ritespeed' units, the correct oil level is the lip of the oil level aperture (top plug) in the side of the case.

CAL Type Drive



For CAL type drives, the correct oil level is the centre of the relief valve body, visible through the filler aperture.