VERSIONS

Mounting flange	Shaft	Port size	European version	US version	Drain connection	Check valve	Main type designation
Standard flange	Cyl. 50 mm	G1	❍		Yes	Yes	OMV
	Cyl. 2.25 in	1 5/16-12 UN		❍	Yes	Yes	OMV
	Splined 2.125 in	G1	❍		Yes	Yes	OMV
		1 5/16-12 UN		❍	Yes	Yes	OMV
	Tapered 60 mm	G1	❍		Yes	Yes	OMV
	Tapered 2.25 in	1 5/16-12 UN		❍	Yes	Yes	OMV
SAE-C flange	Cyl. 2.25 in	1 5/16-12 UN		❍	Yes	Yes	OMV
	Splined 2.125 in	1 5/16-12 UN		❍	Yes	Yes	OMV
Wheel	Cyl. 50 mm	G1	❍		Yes	Yes	OMVW
	Tapered 60 mm	G1	❍		Yes	Yes	OMVW
	Tapered 2.25 in	1 5/16-12 UN		❍	Yes	Yes	OMVW
Short	No output shaft	G1	❍		Yes	Yes	OMVS

Function diagram - see page : ⟶

Features available (options) :
Speed sensor
Motor with tacho connection
Viton shaft seal
Painted
Ultra short

CODE NUMBERS

CODE NUMBERS	Displacement [cm³]					Technical data – Page	Shaft loads – Page	Dimensions – Page
	315	400	500	630	800			
151B	3100	3101	3102	3103	3104	60	63	72
151B	2150	2151	2152	2153	2154	60	63	73
151B	3105	3106	3107	3108	3109	60	63	72
151B	2155	2156	2157	2158	2159	60	63	73
151B	3110	3111	3112	3113	3114	60	63	72
151B	2160	2161	2162	2163	2164	60	63	73
151B	2183	2184	2185	2186	2187	60	64	74
151B	2188	2189	2190	2191	2192	60	64	74
151B	3115	3116	3117	3118	3119	60	63	75
151B	3120	3121	3122	3123	3124	60	63	75
151B	2170	2171	2172	2173	2174	60	63	76
151B	3125	3126	3127	3128	3129	60	–	77
	65	65	66	66	67			

Ordering
Add the four digit prefix "151B" to the four digit numbers from the chart for complete code number.

Example:
151B3101 for an OMV 400 with standard flange, cyl. 50 mm shaft and port size G 1.

Note: Orders will not be accepted without the four digit prefix.

TECHNICAL DATA FOR OMV, OMVW AND OMVS

Type			OMV OMVW OMVS	OMV OMVW OMVS	OMV OMVW OMVS	OMV OMVW OMVS	OMV OMVW OMVS
Motor size			**315**	**400**	**500**	**630**	**800**
Geometric displacement	cm^3 [in^3]		314.5 [19.19]	400.9 [24.46]	499.6 [30.49]	629.1 [38.39]	801.8 [48.93]
Max. speed	min^{-1} [rpm]	cont.	510	500	400	315	250
		int.[1]	630	600	480	380	300
Max. torque	Nm [lbf·in]	cont.	920 [8140]	1180 [10440]	1460 [12920]	1660 [14690]	1880 [16640]
		int.[1]	1110 [9820]	1410 [12480]	1760 [15580]	1940 [17170]	2110 [18680]
Max. output	kW [hp]	cont.	42.5 [57.0]	53.5 [71.7]	53.5 [71.7]	48.0 [64.4]	42.5 [57.0]
		int.[1]	51.0 [68.4]	64.0 [85.8]	64.0 [85.8]	56.0 [75.1]	48.0 [64.4]
Max. pressure drop	bar [psi]	cont.	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
		int.[1]	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]
		peak[2]	280 [4060]	280 [4060]	280 [4060]	240 [3480]	210 [3050]
Max. oil flow	l/min [USgal/min]	cont.	160 [42.3]	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]
		int.[1]	200 [52.8]	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]
Max. starting pressure with unloaded shaft	bar [psi]		8 [116]	8 [116]	8 [116]	8 [116]	8 [116]
Min. starting torque	at max. press. drop cont. Nm [lbf·in]		710 [6280]	910 [8050]	1130 [10000]	1330 [11770]	1510 [13360]
	at max. press. drop int.[1] Nm [lbf·in]		850 [7520]	1090 [9650]	1360 [12040]	1550 [13720]	1700 [15050]

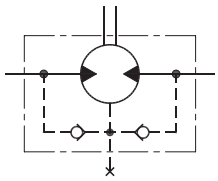
Type			Max. inlet pressure	Max. return pressure with drain line
OMV OMVW OMVS	bar [psi]	cont.	210 [3050]	140 [2030]
	bar [psi]	int.[1]	250 [3630]	175 [2540]
	bar [psi]	peak[2]	300 [4350]	210 [3050]

[1] Intermittent operation: the permissible values may occur for max. 10% of every minute.
[2] Peak load: The permissible values may occur for max. 1% of every minute.

For max. permissible combination of flow and pressure, see function diagram for actual motor.

MAX. PERMISSIBLE SHAFT SEAL PRESSURE

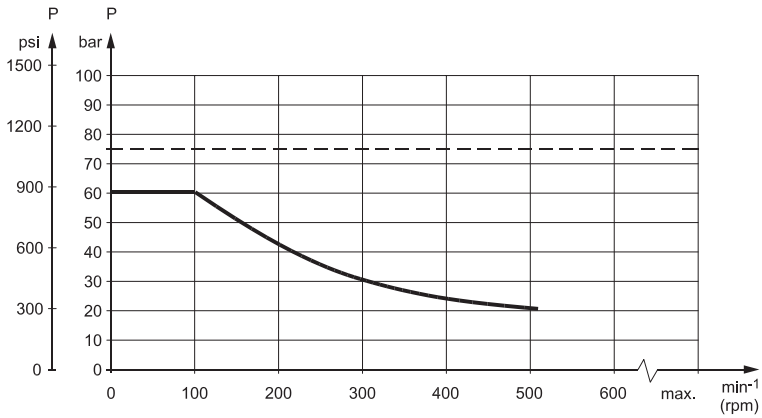
OMV with check valves and without use of drain connection:
The pressure on the shaft seal never exceeds the pressure in the return line



151-320.10

OMV with check valves and with drain connection:
The shaft seal pressure equals the pressure on the drain line.

Max. return pressure without drain line or max. pressure in the drain line

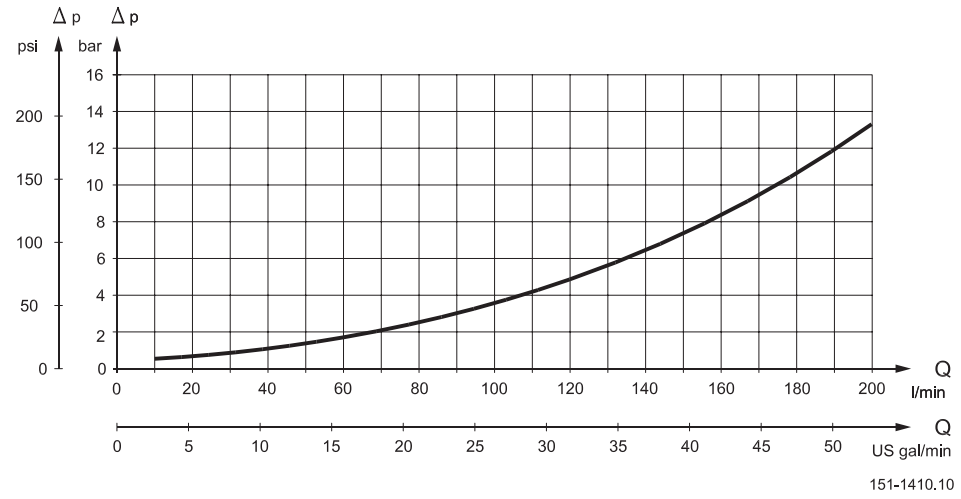


151-1673.10

– – – – Intermittent operation: the permissible values may occur for max. 10% of every minute.

——— Continuous operation

PRESSURE DROP IN MOTOR



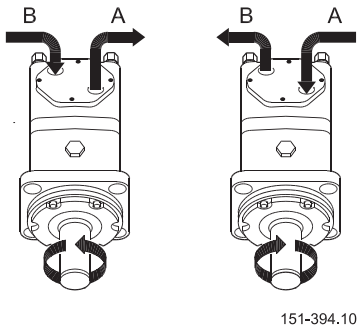
The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm^2/s (165 SUS)

OIL FLOW IN DRAIN LINE

The table shows the max. oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi].

Pressure drop bar [psi]	Viscosity mm²/s [SUS]	Oil flow in drain line l/min [US gal/min]
140 [2030]	20 [100]	3.0 [0.79]
	35 [165]	2.0 [0.53]
210 [3050]	20 [100]	6.0 [1.59]
	35 [165]	4.0 [1.06]

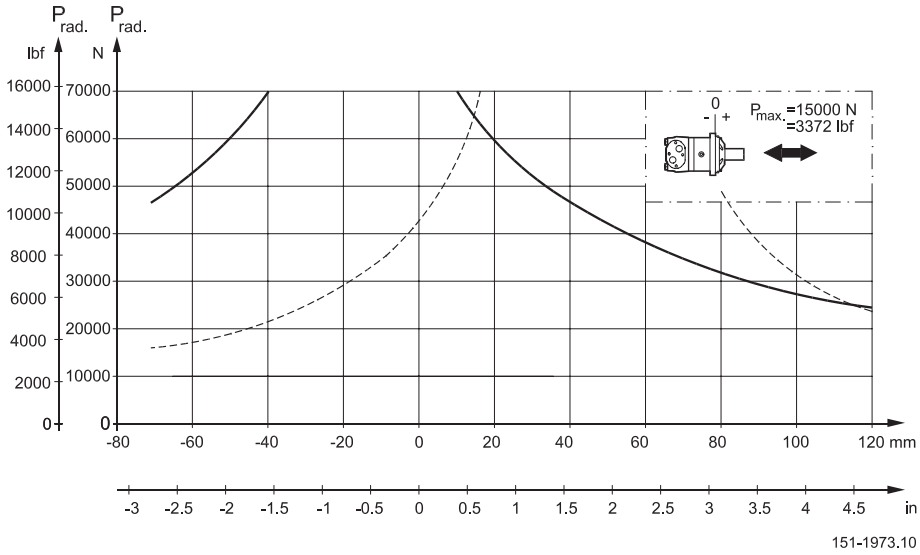
DIRECTION OF SHAFT ROTATION



PERMISSIBLE SHAFT LOADS FOR OMV

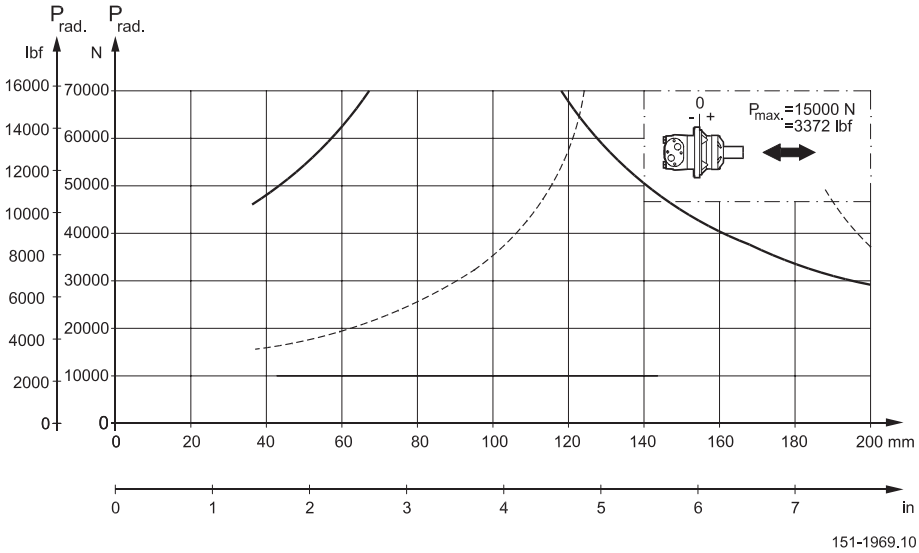
Mounting flange:
Standard

Shaft:
All shaft types



Mounting flange:
Wheel

Shaft:
All shaft types

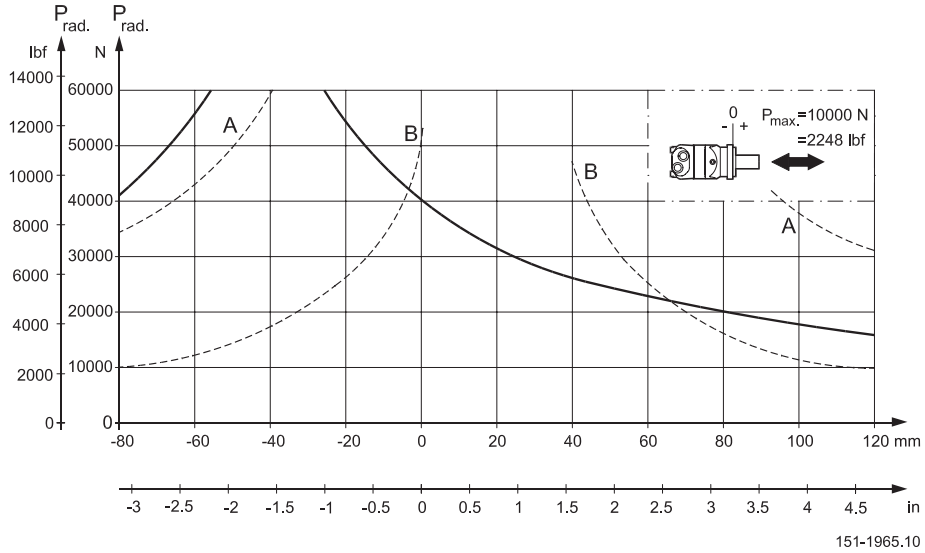


The output shaft runs in tapered roller bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.
The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.
For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" DHMH.PK.100.G2.02 520L0232.

PERMISSIBLE SHAFT LOADS FOR OMV

Mounting flange:
SAE-C

Shaft:
All shaft types

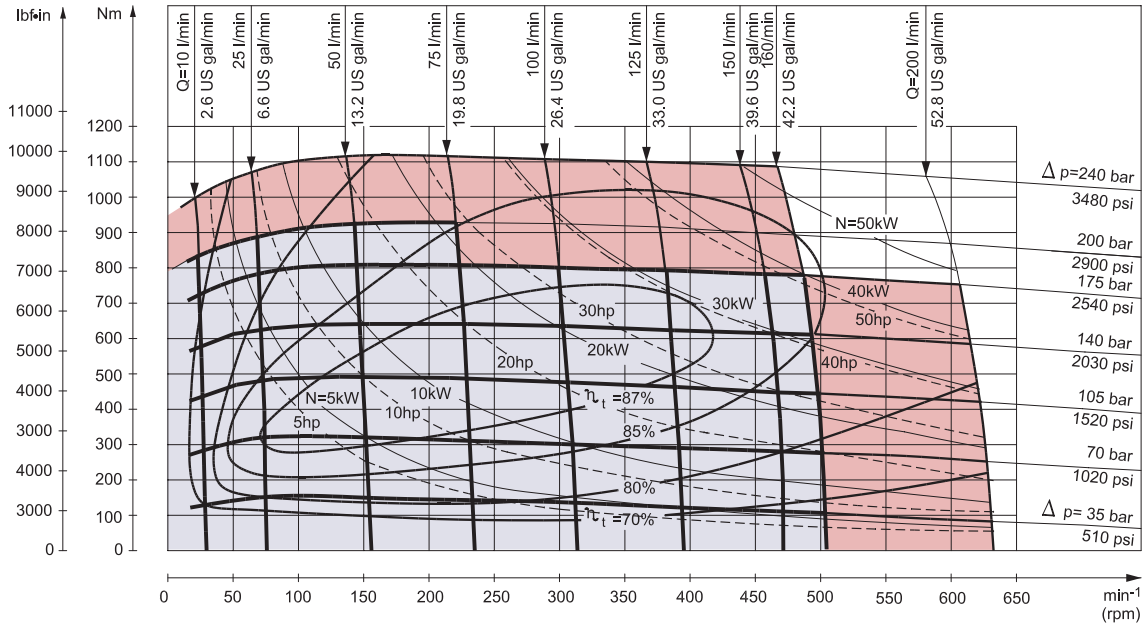


A: Cyl. 2.25 in shaft
B: Splined 2.125 in shaft

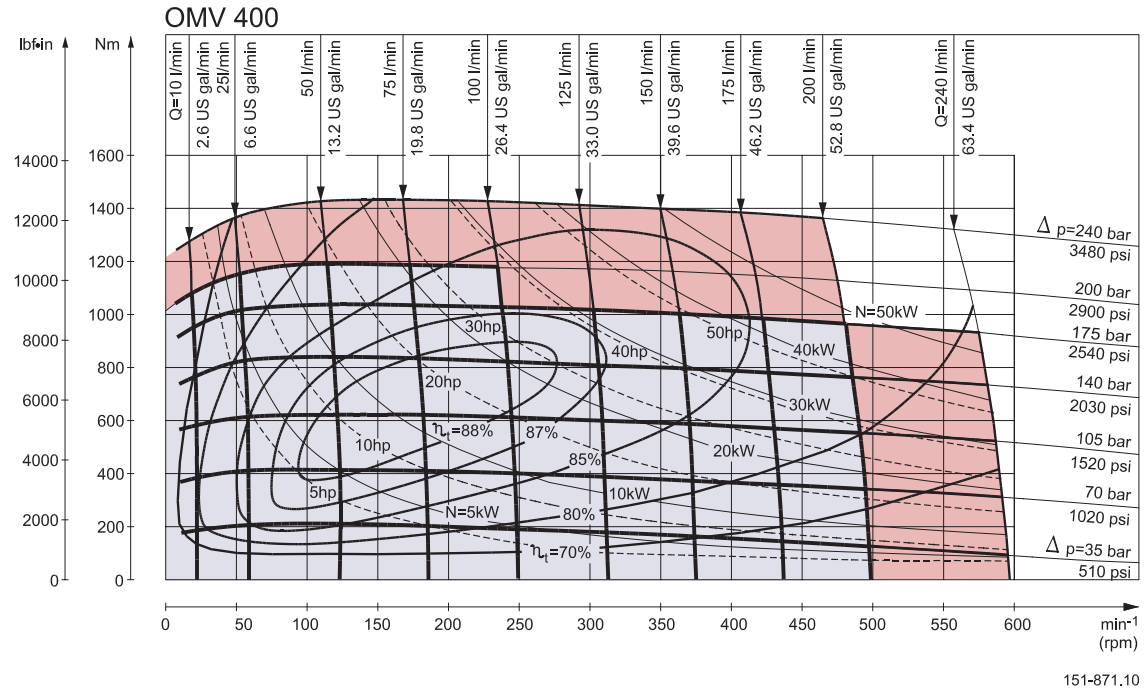
The output shaft runs in tapered roller bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.
The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.
For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" DHMH.PK.100.G2.02 520L0232.

FUNCTION DIAGRAMS

OMV 315



OMV 400

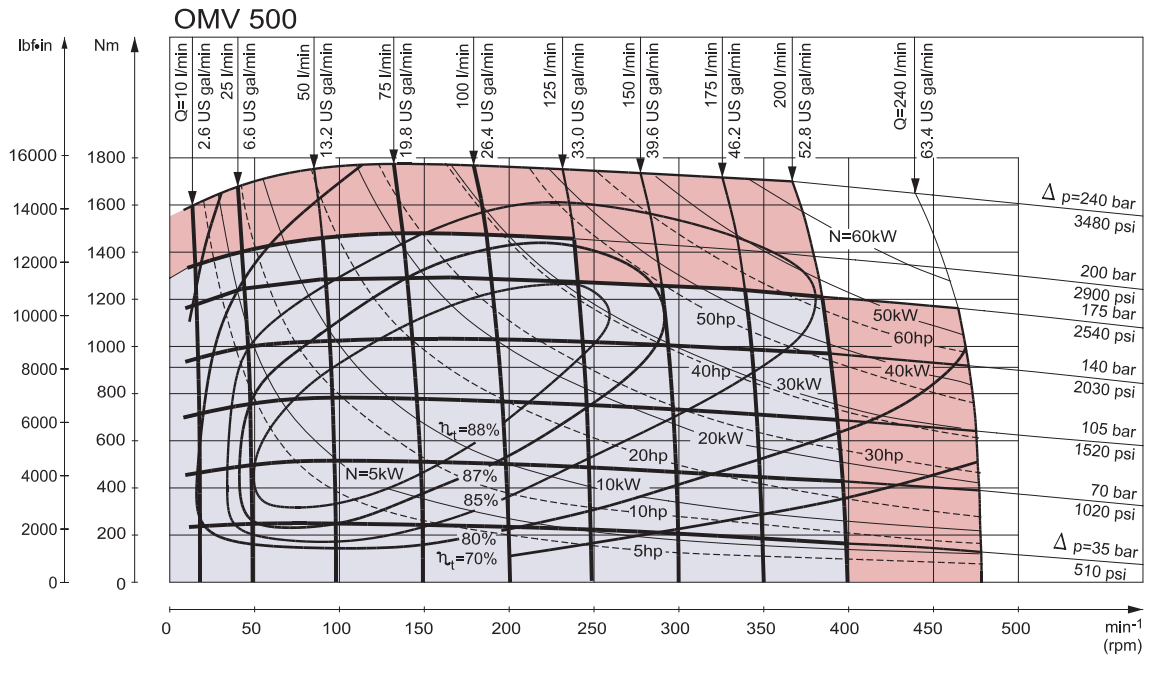


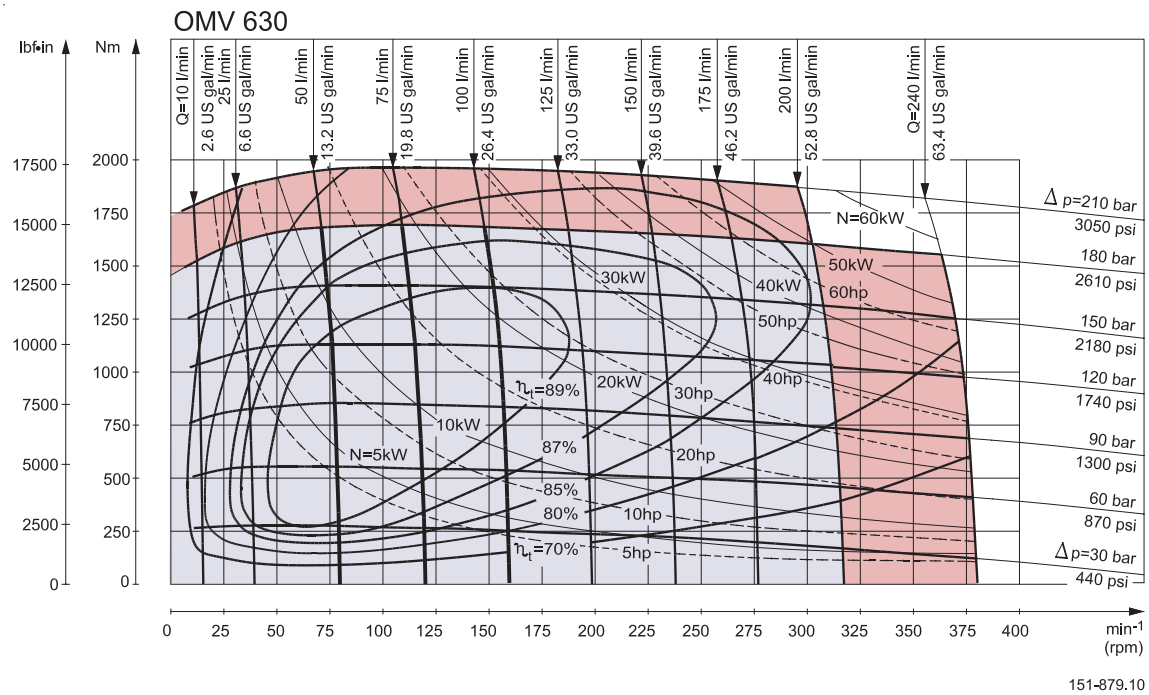
Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

Note: Intermittent pressure drop and oil flow must not occur simultaneously.

FUNCTION DIAGRAMS



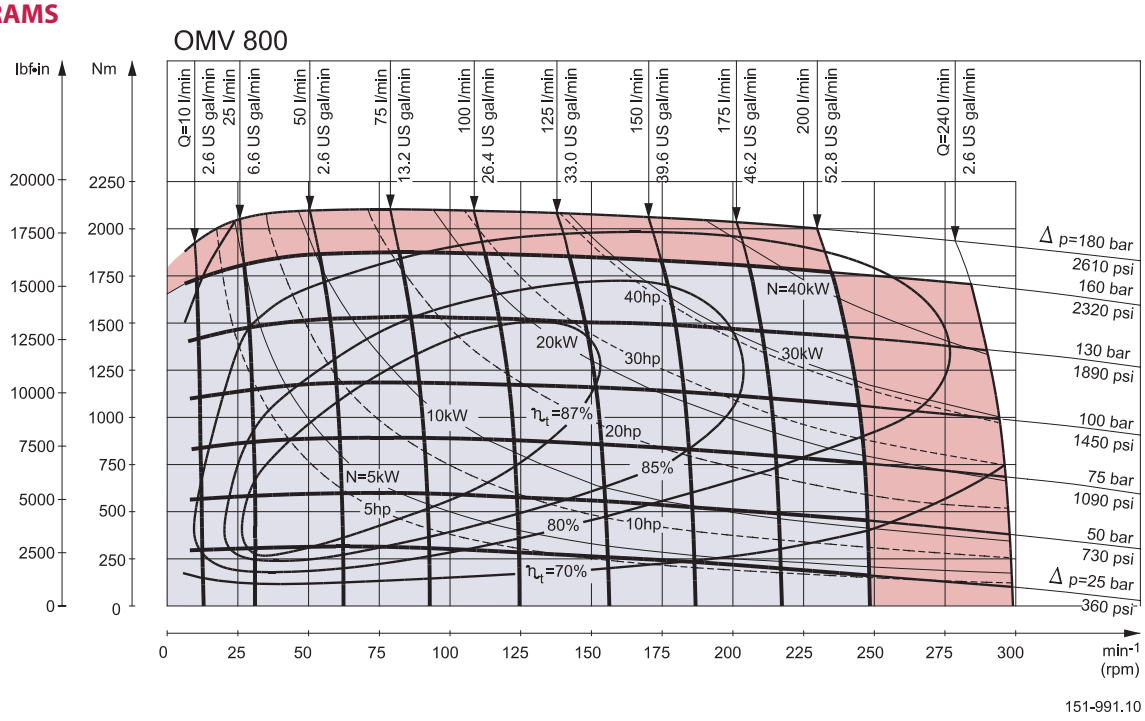


Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

Note: Intermittent pressure drop and oil flow must not occur simultaneously.

FUNCTION DIAGRAMS



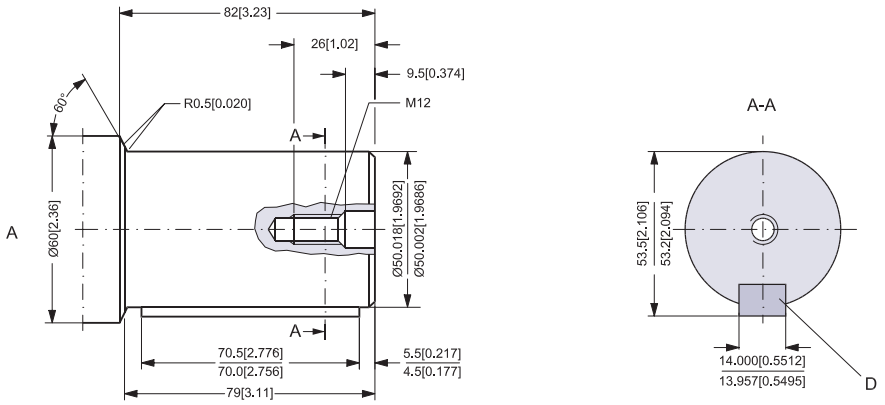
Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

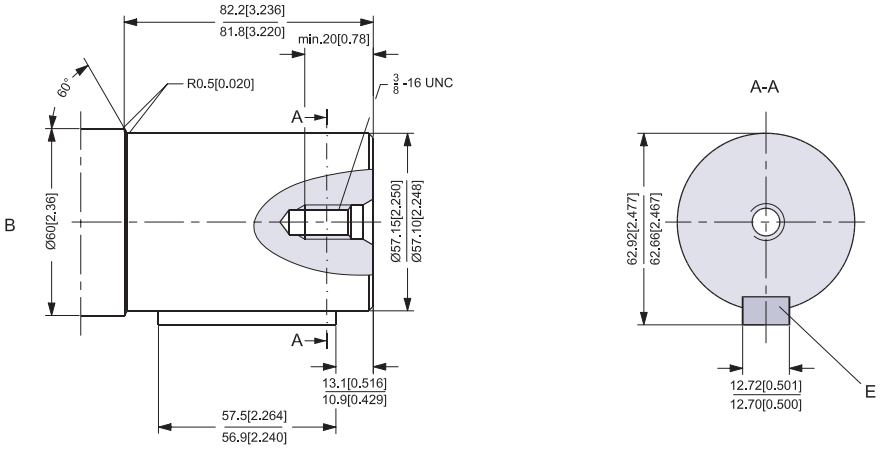
Note: Intermittent pressure drop and oil flow must not occur simultaneously.

SHAFT VERSION

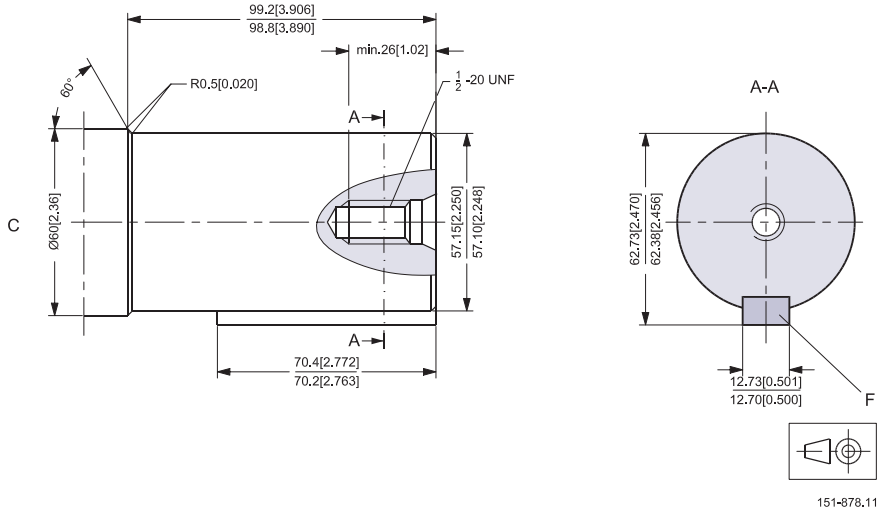
A: Cylindrical 50 mm shaft
D: Parallel key
A14 × 9 × 70
DIN 6885



B: Cylindrical 2.25 in shaft for OMV with standard mounting flange
E: Parallel key
$^1/_2 \times {}^1/_2 \times 2^1/_4$ in
B.S. 46

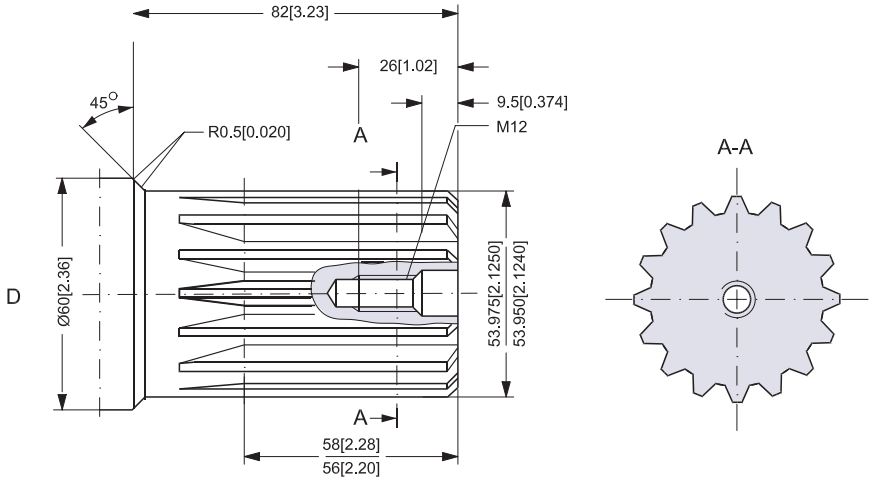


C: Cylindrical 2.25 in shaft for OMV with mounting flange SAE-C
F: Parallel key
$^1/_2 \times {}^1/_2 \times 2^1/_4$ in
B.S. 46

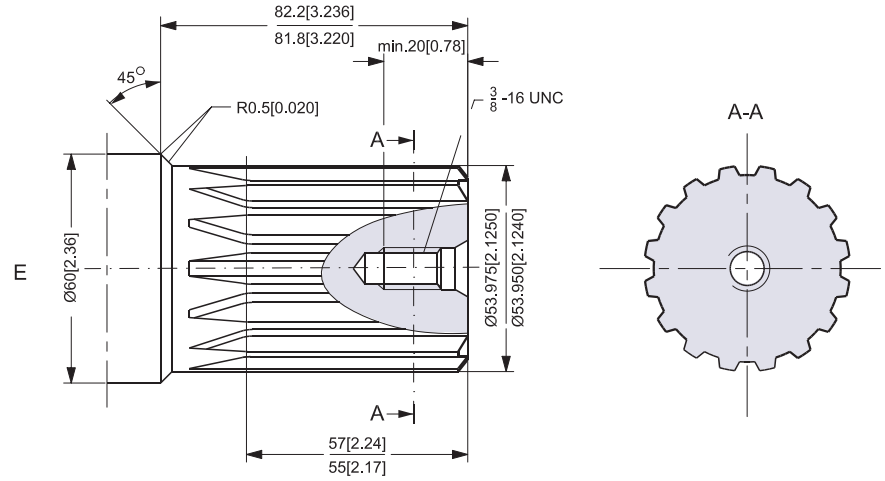


SHAFT VERSION

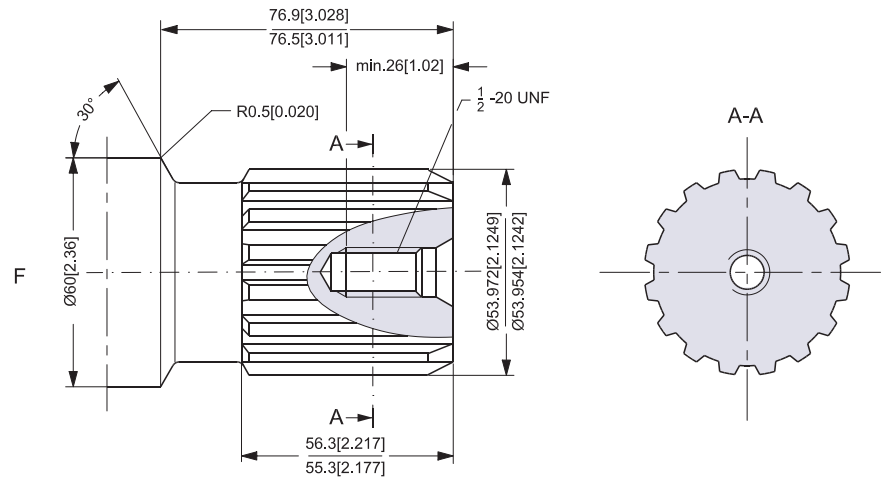
D: Involute splined shaft
ANS B92.1 - 1970 standard
Flat root side fit
Pitch $^{8}/_{16}$
Teeth 16
Major dia. 2.125 in
Pressure angle 30°

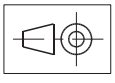


US Version
E: Involute splined shaft
for OMV with standard
mounting flange
ANS B92.1 - 1970 standard
Flat root side fit
Pitch $^{8}/_{16}$
Teeth 16
Major dia. 2.125 in
Pressure angle 30°



US Version
F: Involute splined shaft
for OMV with mounting
flange SAE-C
ANS B92.1 - 1970 standard
Flat root side fit
Pitch $^{8}/_{16}$
Teeth 16
Major dia. 2.125 in
Pressure angle 30°

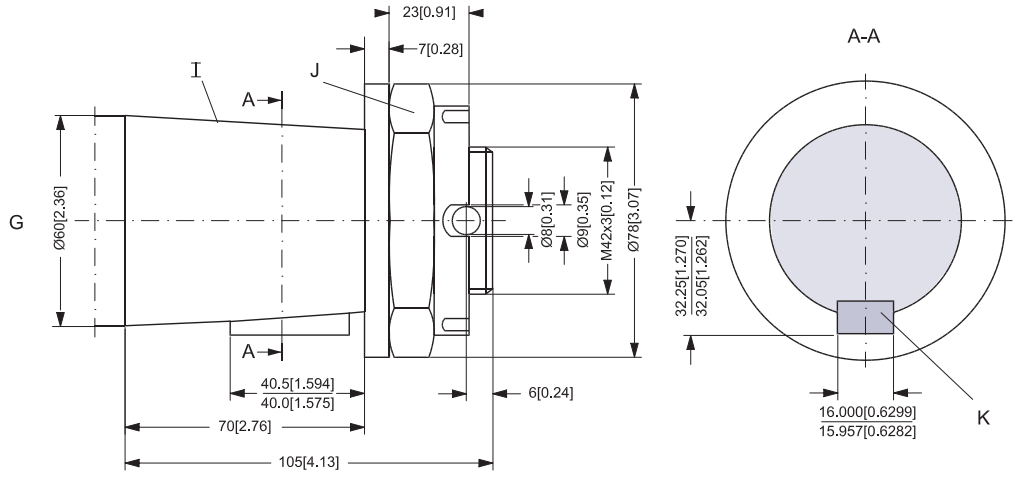




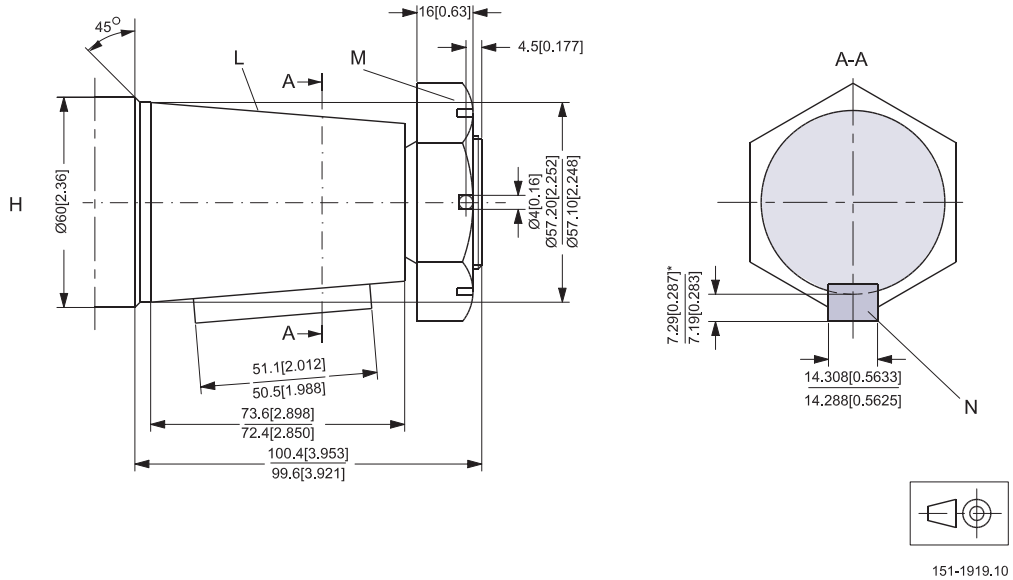
151-1918.10

SHAFT VERSION

G: Tapered 60 mm shaft
(ISO/R775)
J: DIN 937
Across flats: 65 mm
Tightening torque:
750 ±50 Nm [6640 ±440 lbf·in]
I: Taper 1:10
K: Parallel key
B16 × 10 × 32
DIN 6885



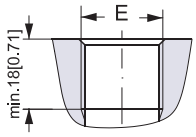
H: Tapered 2.25 in shaft
L: Cone 1:8
SAE J501
M: $1^{1}/_{2}$ - 18 UNEF
Across flats: $2^{3}/_{8}$ in
Tightening torque:
750 ±50 Nm [6640 ±440 lbf·in]
N: Parallel key
$^{9}/_{16} \times {}^{9}/_{16} \times 2$ in
B.S. 46



151-1919.10

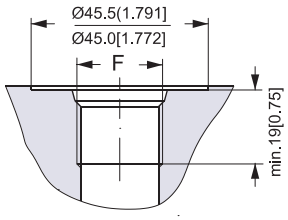
PORT THREAD VERSIONS

A



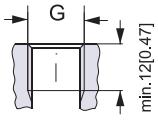
A: G main ports
E: ISO 228/1 - G1

B



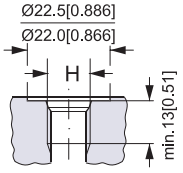
B: UN main ports
F: 1 5/16 - 12 UN
O-ring boss port

C



C: G drain port
G: ISO 228/1 - G1/4

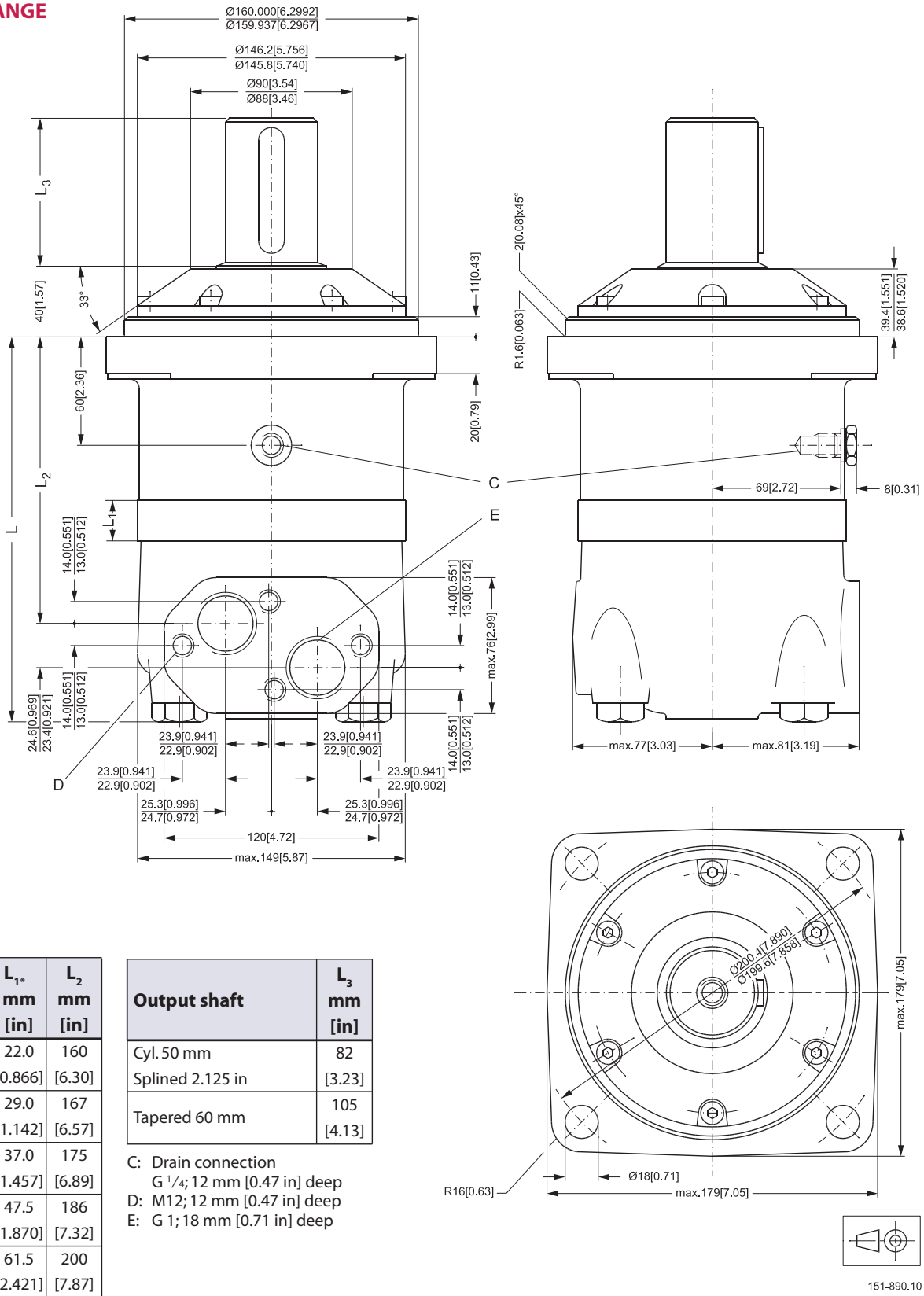
D



151-1978.10

D: UNF drain port
H: 9/16 - 18 UNF
O-ring boss port

STANDARD FLANGE



Type	$L_{max.}$ mm [in]	L_{1*} mm [in]	L_2 mm [in]
OMV 315	215 [8.46]	22.0 [0.866]	160 [6.30]
OMV 400	222 [8.74]	29.0 [1.142]	167 [6.57]
OMV 500	230 [9.05]	37.0 [1.457]	175 [6.89]
OMV 630	240 [9.45]	47.5 [1.870]	186 [7.32]
OMV 800	254 [10.00]	61.5 [2.421]	200 [7.87]

Output shaft	L_3 mm [in]
Cyl. 50 mm Splined 2.125 in	82 [3.23]
Tapered 60 mm	105 [4.13]

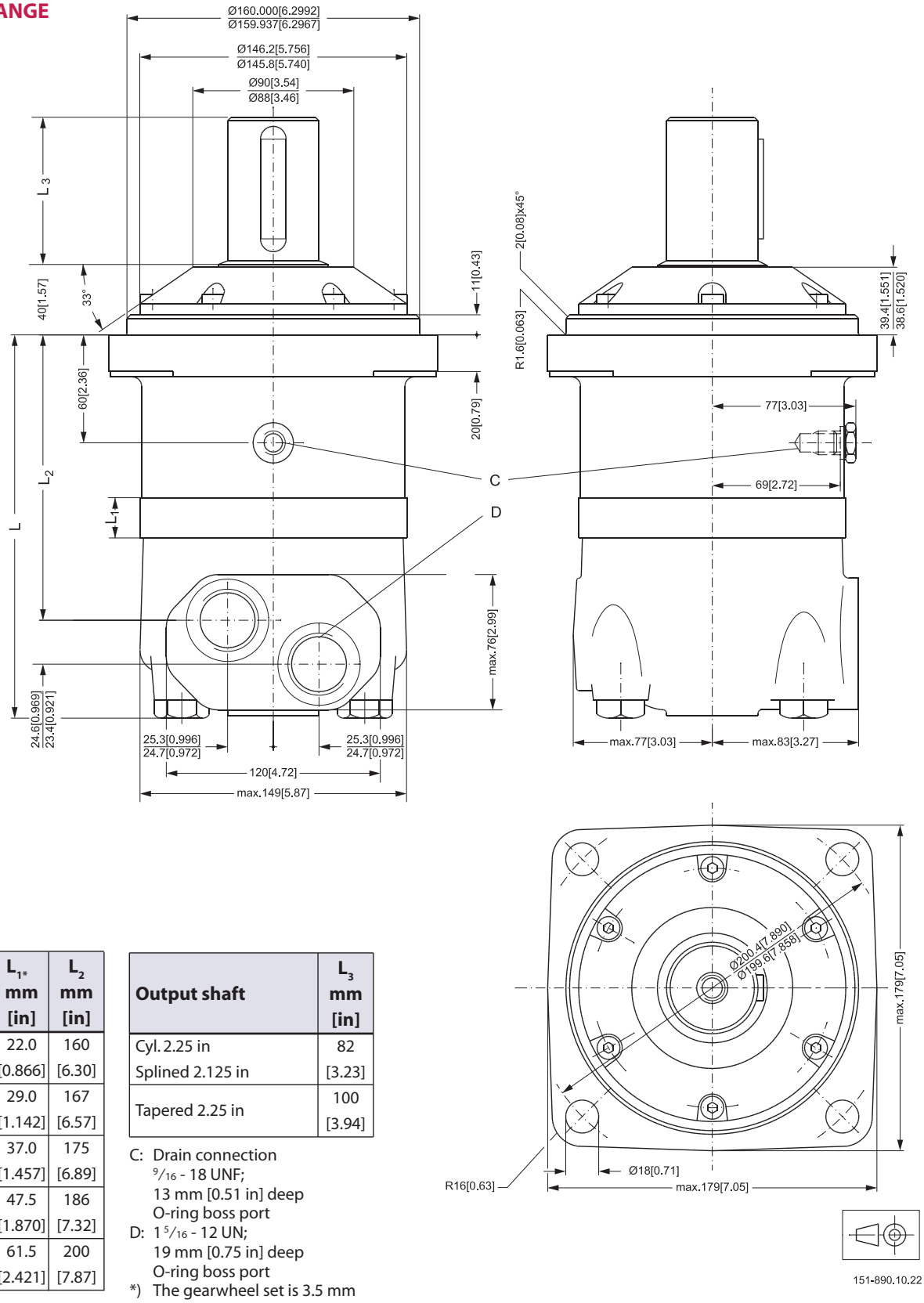
C: Drain connection G 1/4; 12 mm [0.47 in] deep
D: M12; 12 mm [0.47 in] deep
E: G 1; 18 mm [0.71 in] deep

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions

151-890.10

Dimensions – US version

STANDARD FLANGE



Type	$L_{max.}$ mm [in]	L_{1*} mm [in]	L_2 mm [in]
OMV 315	215 [8.46]	22.0 [0.866]	160 [6.30]
OMV 400	222 [8.74]	29.0 [1.142]	167 [6.57]
OMV 500	230 [9.05]	37.0 [1.457]	175 [6.89]
OMV 630	240 [9.45]	47.5 [1.870]	186 [7.32]
OMV 800	254 [10.00]	61.5 [2.421]	200 [7.87]

Output shaft	L_3 mm [in]
Cyl. 2.25 in Splined 2.125 in	82 [3.23]
Tapered 2.25 in	100 [3.94]

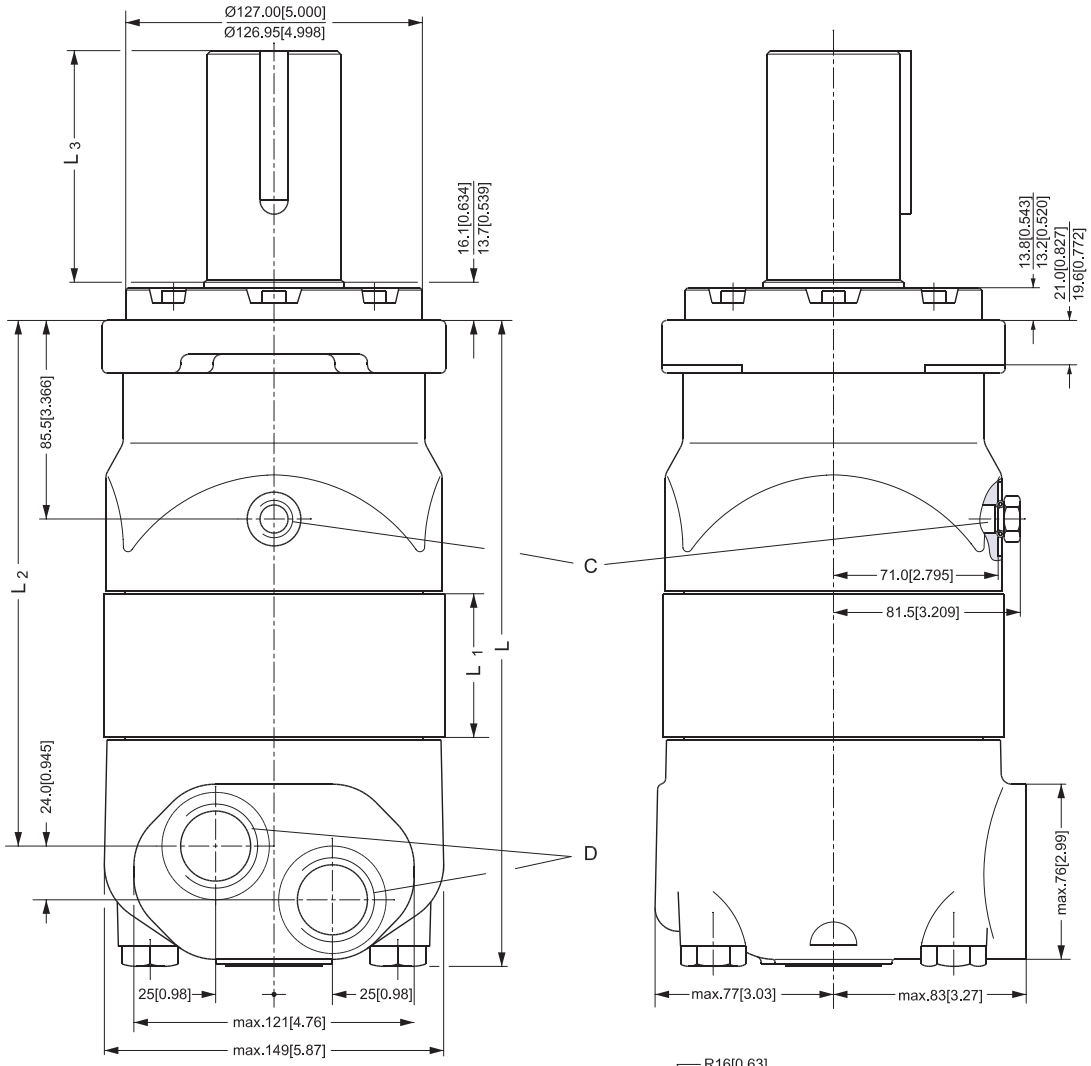
C: Drain connection
$^{9}/_{16}$ - 18 UNF;
13 mm [0.51 in] deep
O-ring boss port

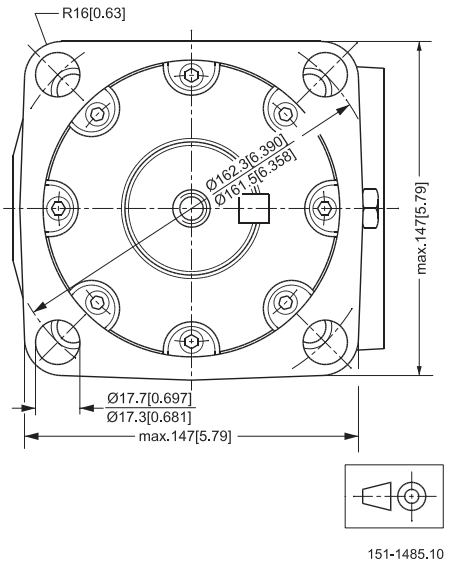
D: $1\,^{5}/_{16}$ - 12 UN;
19 mm [0.75 in] deep
O-ring boss port

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions

151-890.10.22

SAE-C FLANGE





151-1485.10

Type	$L_{max.}$ mm [in]	L_{1*} mm [in]	L_2 mm [in]
OMV 315	239 [9.41]	22.0 [0.866]	185 [7.28]
OMV 400	246 [9.69]	29.0 [1.142]	192 [7.56]
OMV 500	254 [10.00]	37.0 [1.457]	200 [7.87]
OMV 630	265 [10.43]	47.5 [1.870]	211 [8.31]
OMV 800	279 [10.98]	61.5 [2.421]	225 [8.86]

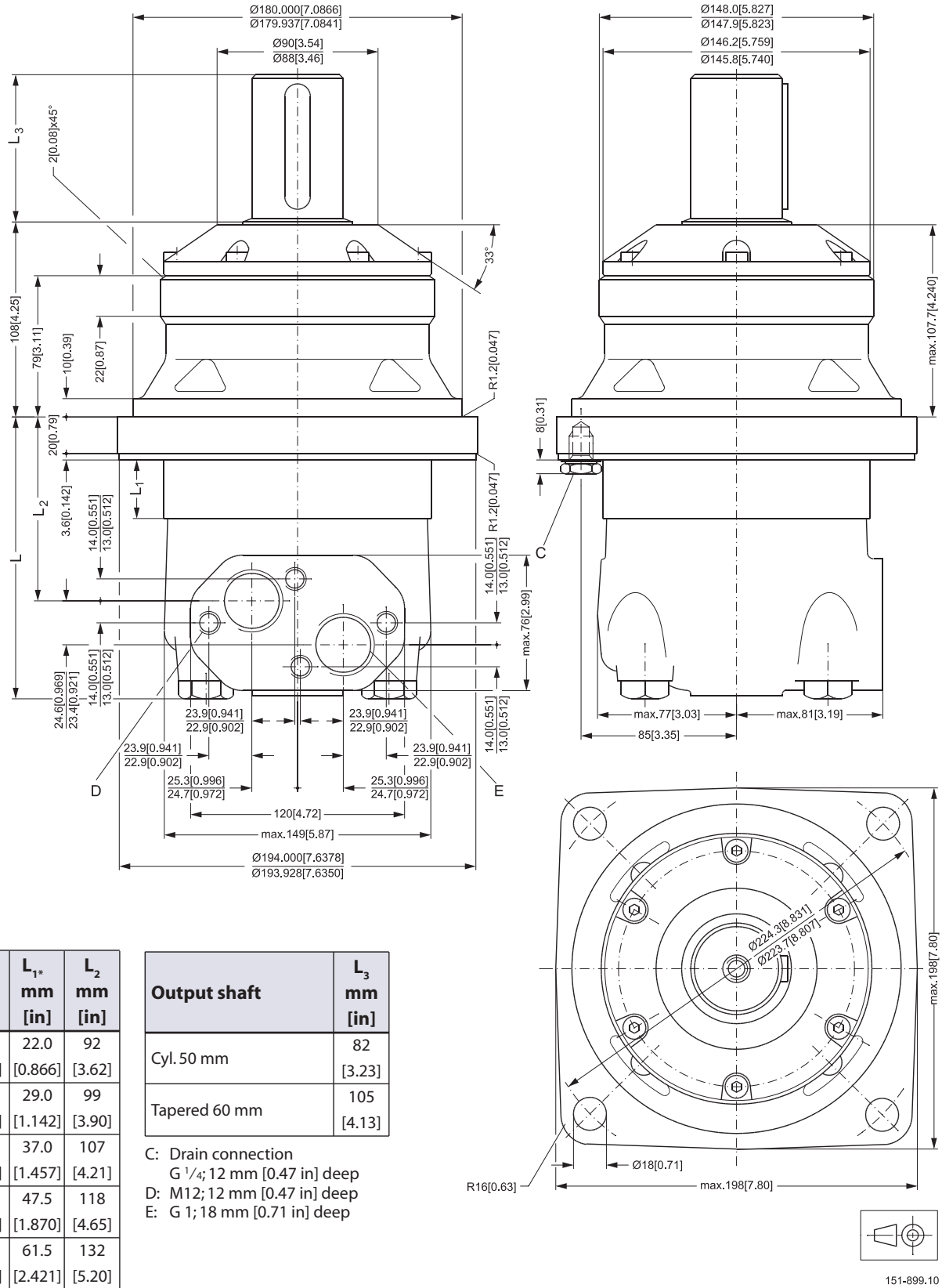
Output shaft	L_3 mm [in]
Cyl. 2.25 in	99 [3.90]
Splined 2.125 in	76.7 [3.02]

C: Drain connection
$^{9}/_{16}$ - 18 UNF;
13 mm [0.51 in] deep
O-ring boss port

D: $1\,^{5}/_{16}$ - 12 UN;
19 mm [0.75 in] deep
O-ring boss port

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions

WHEEL



Type	$L_{max.}$ mm [in]	L_{1*} mm [in]	L_2 mm [in]
OMVW 315	146 [5.75]	22.0 [0.866]	92 [3.62]
OMVW 400	153 [6.02]	29.0 [1.142]	99 [3.90]
OMVW 500	161 [6.34]	37.0 [1.457]	107 [4.21]
OMVW 630	172 [6.77]	47.5 [1.870]	118 [4.65]
OMVW 800	185 [7.28]	61.5 [2.421]	132 [5.20]

Output shaft	L_3 mm [in]
Cyl. 50 mm	82 [3.23]
Tapered 60 mm	105 [4.13]

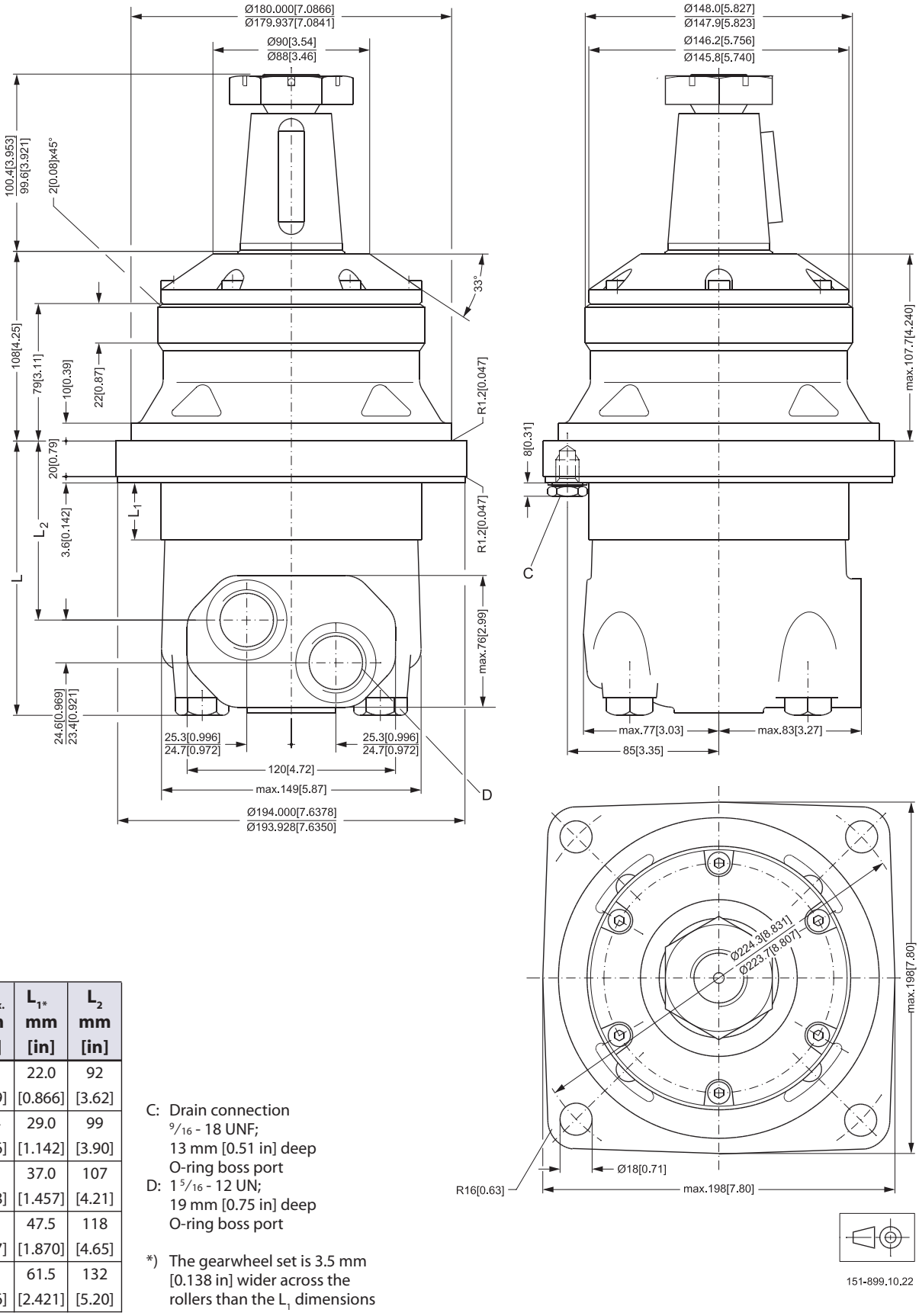
C: Drain connection G 1/4; 12 mm [0.47 in] deep
D: M12; 12 mm [0.47 in] deep
E: G 1; 18 mm [0.71 in] deep

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions

151-899.10

OMV
Technical Information
Dimensions – US version

WHEEL



Type	$L_{max.}$ mm [in]	L_{1*} mm [in]	L_2 mm [in]
OMVW 315	147 [5.79]	22.0 [0.866]	92 [3.62]
OMVW 400	154 [6.06]	29.0 [1.142]	99 [3.90]
OMVW 500	162 [6.38]	37.0 [1.457]	107 [4.21]
OMVW 630	172 [6.77]	47.5 [1.870]	118 [4.65]
OMVW 800	187 [7.36]	61.5 [2.421]	132 [5.20]

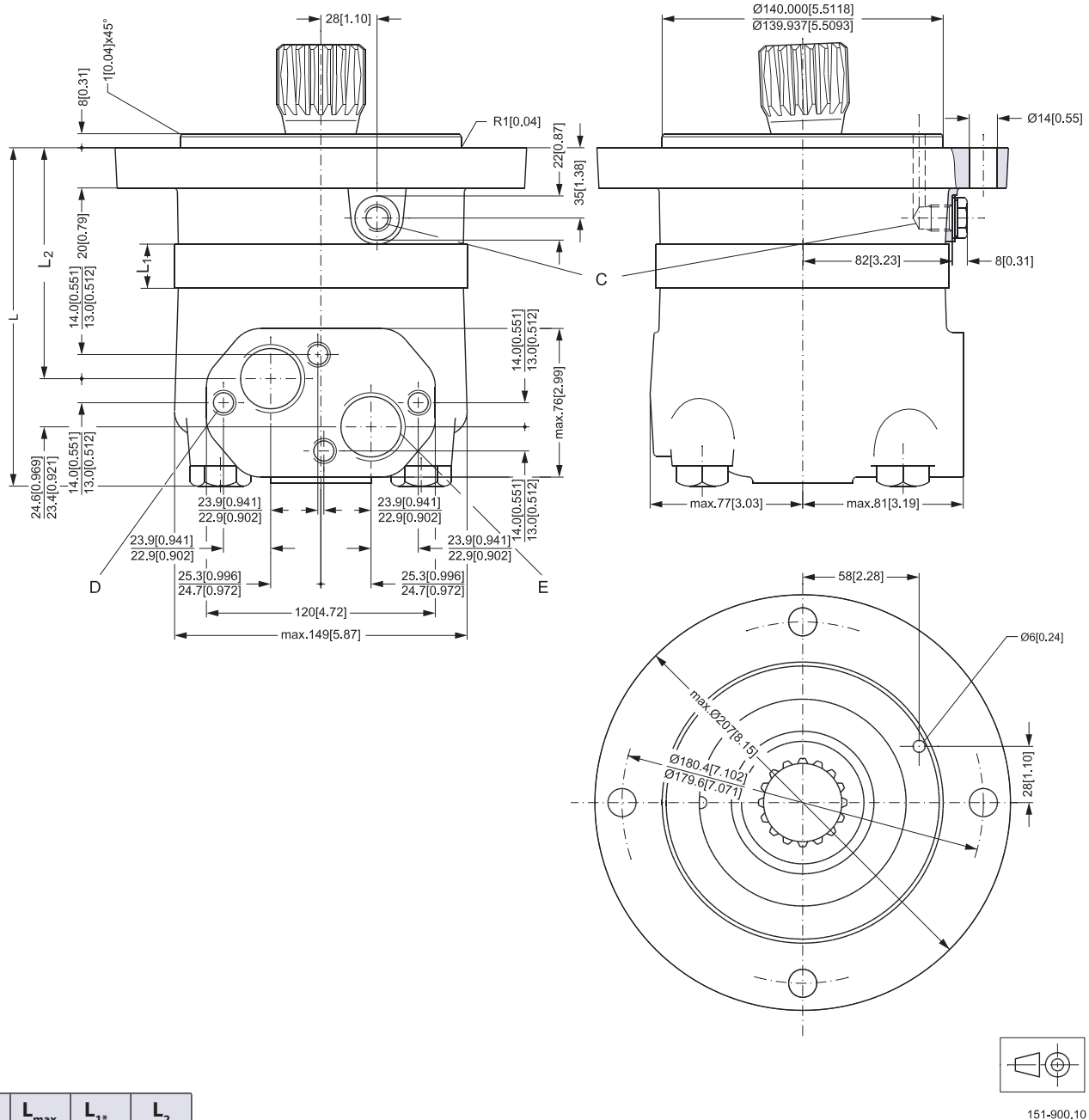
C: Drain connection
9/16 - 18 UNF;
13 mm [0.51 in] deep
O-ring boss port

D: 1 5/16 - 12 UN;
19 mm [0.75 in] deep
O-ring boss port

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions

Dimensions – European version

SHORT



151-900.10

Type	$L_{max.}$ mm [in]	L_{1*} mm [in]	L_2 mm [in]
OMVS 315	171 [6.73]	22.0 [0.866]	117 [4.61]
OMVS 400	179 [7.05]	29.0 [1.142]	124 [4.88]
OMVS 500	186 [7.32]	37.0 [1.457]	132 [5.20]
OMVS 630	197 [7.76]	47.5 [1.870]	143 [5.63]
OMVS 800	211 [8.31]	61.5 [2.421]	157 [6.18]

C: Drain connection G 1/4; 12 mm [0.47 in] deep
D: M12; 12 mm [0.47 in] deep
E: G 1; 18 mm [0.71 in] deep

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions

INSTALLING THE OMVS

The cardan shaft of the OMVS motor acts as an "output shaft". Because of the movement of the shaft, no seal can be fitted at the shaft output.
Internal oil leakage from the motor will therefore flow into the attached component.

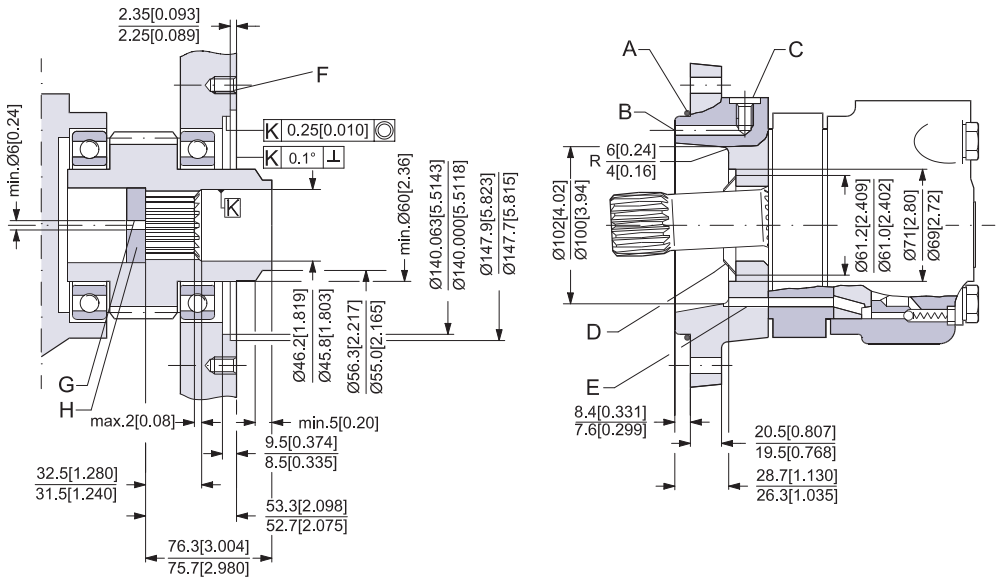
During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate plate is recommended. This method is used in the OMV.

The conical sealing ring (code. no. 633B9021) is supplied with the motor.

To ensure that oil runs to the bearings and other parts of the attached component, the stop plate must have a hole in it (see fig. below).

We recommend an O-ring between motor and attached component. The O-ring (code no. 151B1041) is supplied with the motor. If motor and attached component have been separated, remember to refill before starting up. Fill the oil through the drain connection.

OMVS DIMENSIONS OF THE ATTACHED COMPONENT



A: O-ring: 140 × 3 mm
B: External drain channel
C: Drain connection
G 1/4; 12 mm [0.47 in] deep
D: Conical seal ring
E: Internal drain channel
F: M12; min. 18 mm [0.71 in] deep
G: Oil circulation hole
H: Hardened stop plate

INTERNAL SPLINE DATA FOR THE COMPONENT TO BE ATTACHED

The attached component must have internal splines corresponding to the external splines on the motor cardan shaft (see drawing below).

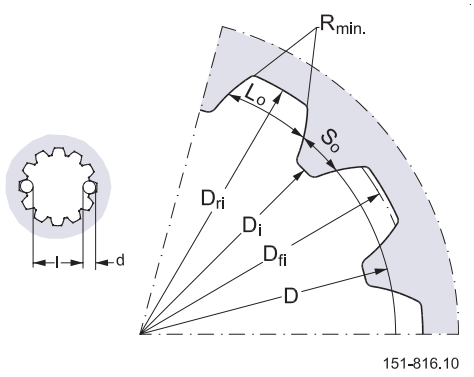
Material:
Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (900 N/mm²) or SAE 8620.

Hardening specification:
- On the surface: HV = 750 ± 50
- 0.7 ± 0.2 mm under the surface: HV = 560

Internal involute spline data
Standard ANS B92.1-1970, class 5 (corrected m · X = 1; m = 2.54)

Fillet root side fit		mm	in
Number of teeth	z	16	16
Pitch	DP	10/20	10/20
Pressure angle		30°	30°
Pitch dia.	D	40.640	1.6
Major dia.	D_{ri}	$45.2\ ^{+0.4}_{0}$	$1.780\ ^{+0.016}_{0}$
Form dia. (min.)	D_{fi}	44.6	1.756
Minor dia.	D_i	$38.5\ ^{+0.039}_{0}$	$1.516\ ^{+0.0015}_{0}$
Space width (circular)	L_o	$5.180\ ^{\pm0.037}$	$0.204\ ^{\pm0.0015}$
Tooth thickness (circular)	S_o	2.835	0.1116
Fillet radius	$R_{min.}$	0.4	0.015
Max. measurement between pins*	l	$32.47\ ^{+0.15}_{0}$	$1.278\ ^{+0.006}_{0}$
Pin dia.	d	$5.6\ ^{\pm0.001}$	$0.22\ ^{\pm0.00004}$

* Finished dimensions (when hardened)



DRAIN CONNECTION ON OMVS OR ATTACHED COMPONENT

A drain line ought to be used when pressure in the return line can exceed the permissible pressure on the shaft seal of the attached component.

The drain line can be connected at two different points:
1) at the motor drain connection
2) at the drain connection of the attached component.

If a drain line is fitted to the attached component, it must be possible for oil to flow freely between motor and attached component.

The drain line must be led to the tank in such a way that there is no risk of the motor and attached component being drained of oil when at rest.
The maximum pressure in the drain line is limited by the attached component and its shaft seal.