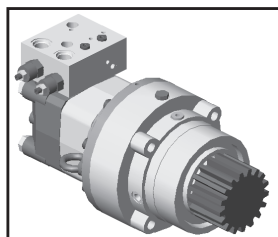
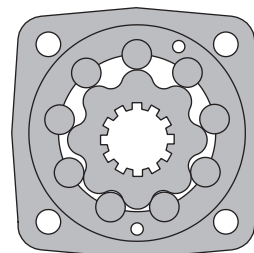


HYDRAULIC MOTOR-BRAKES TW500B350...V



APPLICATION

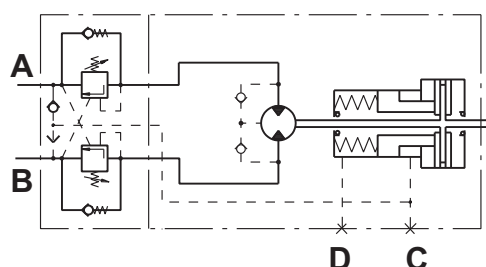
- » Wheel drives
- » Conveyors
- » Rotators
- » Positioners
- » Winches
- » Swing drives
- » Door openers



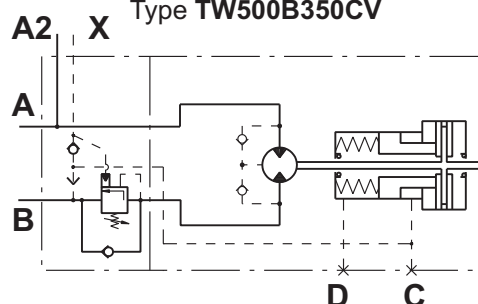
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Motor-Brake
Type TW500B350V



Motor-Brake
Type TW500B350CV



SPECIFICATION DATA

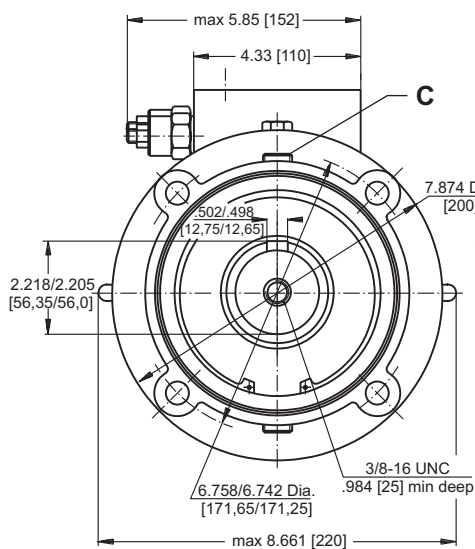
Type		TW500B350...
Displacement, in ³ /rev [cm ³ /rev]		29 [475]
Max. Speed,	Cont.	40
RPM	Int.*	60
Max. Torque,	Cont.	10 000 [114]
lb-in [daNm]	Int.*	12 000 [135]
Max. Output,	Cont.	5.4 [4,1]
HP [kW]	Int.*	9.39 [7,0]
Max. Pressure Drop,	Cont.	2500 [170]
PSI [bar]	Int.*	2900 [200]
Max. Oil Flow,	Cont.	5.3 [20]
GPM [lpm]	Int.*	9.2 [35]
Max. Return Pressure without Drain Line or Max. Pressure in Drain Line, PSI [bar]		1088 [75]
Min. Starting Torque,	At max. press. drop Cont.	8400 [95]
lb-in [daNm]	At max. press. drop Int.*	9940 [112]
Min. Speed**, RPM		5
Static Torque for the Brake***, lb-in [daNm]		14 515 [164]
Release Pressure ±10%,	initial	326...400 [22,5...27,5]
PSI [bar]	full	406...493 [28...34]
Max. Steering Pressure, PSI [bar]		3553 [245]
Max. Pressure in Drain Space for the Brake, PSI [bar]		7 [0,5]
Pilot Ratio for the Valve		4,25:1

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

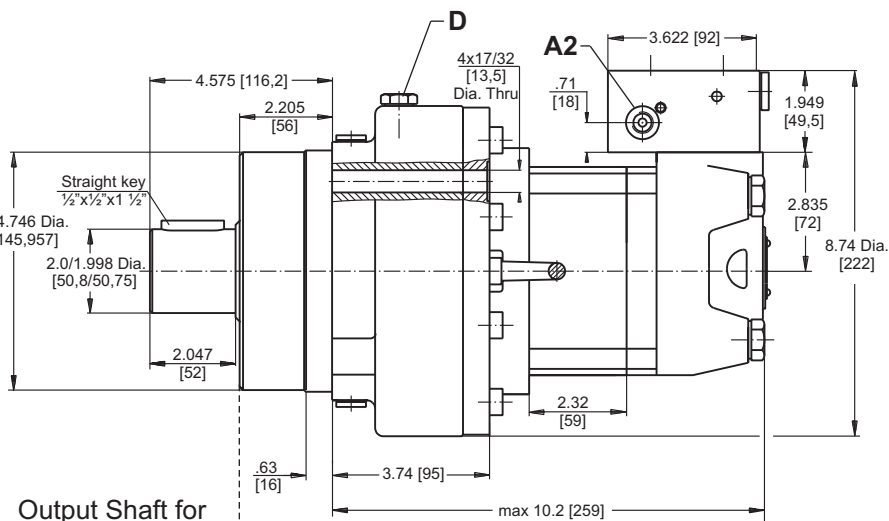
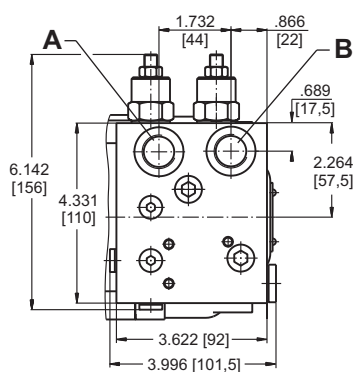
** For speeds of 5 RPM lower than given, consult factory or your regional manager.

*** Static torque is obtained at working pressure - 0 bar [0 PSI].

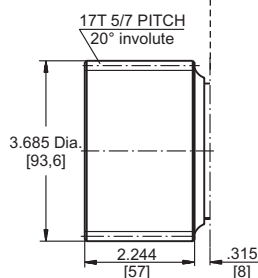
DIMENSIONS AND MOUNTING



Valve Block for TW500B350V

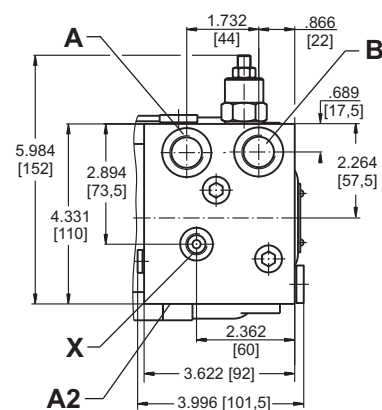


Output Shaft for TW500B350V



A,B : 2x7/8-14 UNF, .65 [17,5] deep
D : 7/16-20 UNF
C : G1/4
A2, X : 7/16-18 UNF, .475 [12] deep

Valve Block for TW500B350CV



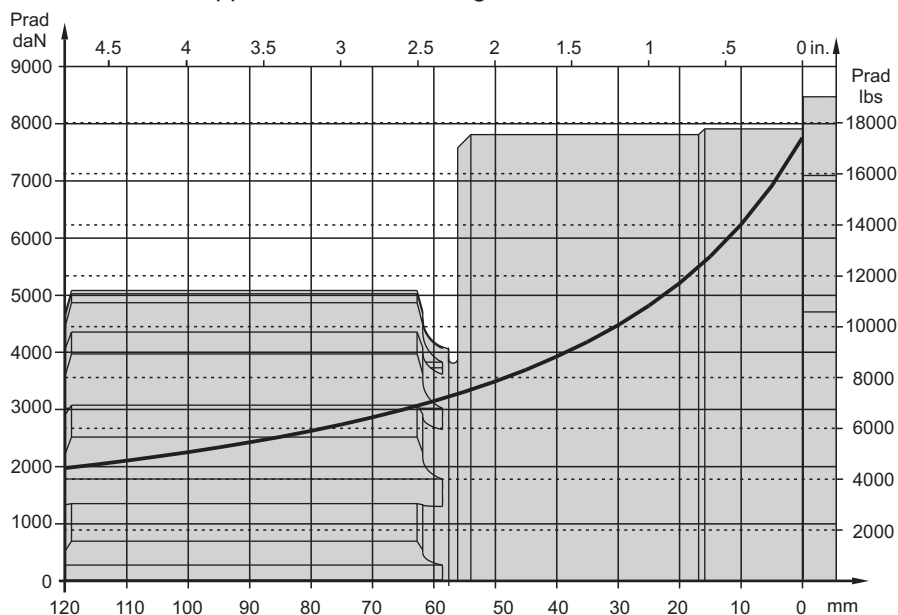
Note: For different port's thread please contact with "M+S Hydraulic".



in [mm]

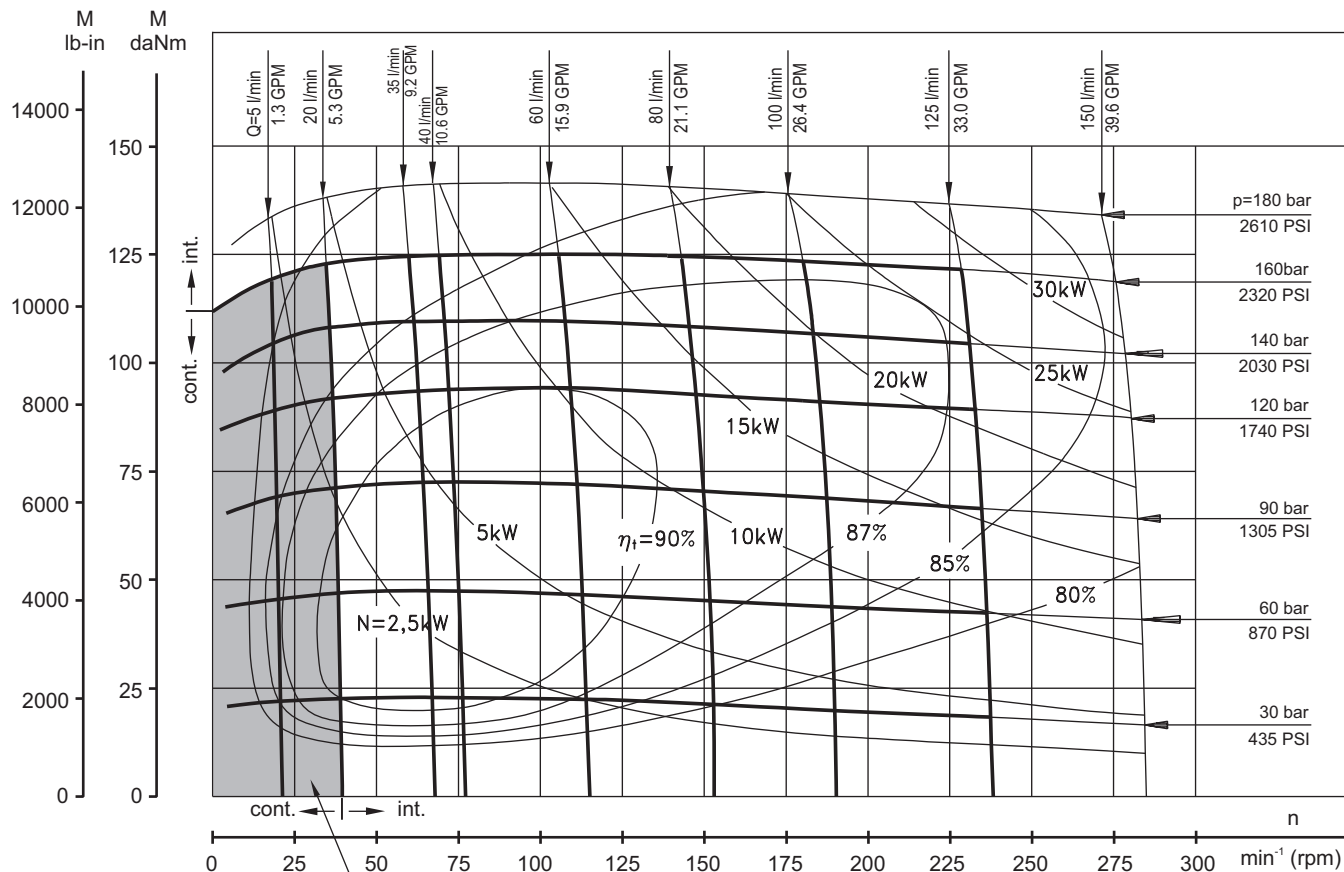
PERMISSIBLE SHAFT LOADS

The curve applies to a B10 bearing life of 3000 hours at 40 RPM.



FUNCTION DIAGRAMS

TW 500



The working area
for TW500B350V

ORDER CODE

1	2	3	4	5	6	7	8
T	W	500	B	350	V		

Pos.1 - Type

T - Motor MLHT

Pos.2 - Displacement code

Pos.3 - Brake

Pos.4 - Brake Type

Pos.5 - Shaft Extension*

omit - 17T 5/7 pitch 20° involute

C - Straight key 1/2"x1/2"x1 1/2"

Pos.6 - Valve

Pos.7 - Additional Options (see page 55)

Pos.8 - Design Series

omit - Factory specified

The motor-brakes are manganophosphatized as standard.

MOTOR-BRAKE ADDITIONAL OPTIONS

Additional Options Description	Order Code	Motor type			
		B/HR	RWB	SW	TW
Low Leakage	LL	○	○	-	-
Low Speed Valving	LSV	○	○	-	-
Free Running	FR	-	-		-
Reverse Rotation	R	○	○	-	-
Paint*	P	○	○	○	○
Corrosion Protected Paint*	PC	○	○	○	○
Special Paint**	PS	○	○	○	○
	PCS				
Check Valves		-	○	S	S

O	Optional
-	Not applicable
S	Standard

* Colour at customer's request.

** Non painted feeding surfaces, colour at customer's request.

APPLICATION CALCULATION

VEHICLE DRIVE CALCULATIONS

1. Motor speed: n , RPM

$$n = \frac{168 \times v_{mi} \times i}{R_m} \quad n = \frac{2,65 \times v_{km} \times i}{R_m}$$

v_{km} - vehicle speed, km/h;
 v_{mi} - vehicle speed, mile/h;
 R_m - wheel rolling radius, m;
 R_{in} - wheel rolling radius, in;
 i - gear ratio between motor and wheels.
 If no gearbox, use $i=1$.

2. Rolling resistance: RR , lbs [daN]

The resistance force resulted in wheels contact with different surfaces:

$$RR = G \times \rho$$

G - total weight loaded on vehicle, lbs [daN];

ρ - rolling resistance coefficient (Table 1).

Table 1

Rolling resistance coefficient In case of rubber tire rolling on different surfaces	
Surface	ρ
Concrete- faultless	0.010
Concrete- good	0.015
Concrete- bad	0.020
Asphalt- faultless	0.012
Asphalt- good	0.017
Asphalt- bad	0.022
Macadam- faultless	0.015
Macadam- good	0.022
Macadam- bad	0.037
Snow- 5 cm	0.025
Snow- 10 cm	0.037
Polluted covering- smooth	0.025
Polluted covering- sandy	0.040
Mud	0.037÷0.150
Sand- Gravel	0.060÷0.150
Sand- loose	0.160÷0.300

3. Grade resistance: GR , lbs [daN]

$$GR = G \times (\sin \alpha + \rho \times \cos \alpha)$$

α - gradient negotiation angle (Table 2)

Table 2

Grade %	α Degrees	Grade %	α Degrees
1%	0° 35'	12%	6° 5'
2%	1° 9'	15%	8° 31'
5%	2° 51'	20%	11° 19'
6%	3° 26'	25%	14° 3'
8%	4° 35'	32%	18°
10%	5° 43'	60%	31°

4. Acceleration force: FA , lbs [daN]

Force FA necessary for acceleration from 0 to maximum speed v and time t can be calculated with a formula:

$$FA = \frac{v_{mi} \times G}{22 \times t}, [\text{lbs}]; \quad FA = \frac{v_{km} \times G}{36 \times t}, [\text{daN}]$$

FA - acceleration force, lbs [daN];

t - time, [s].

5. Tractive effort: DP , lbs [daN]

Tractive effort DP is the additional force of trailer. This value will be established as follows:

-acc.to constructor's assessment;

-as calculating forces in items 2, 3 and 4 of trailer; the calculated sum corresponds to the tractive effort requested.

6. Total tractive effort: TE , lbs [daN]

Total tractive effort TE is total effort necessary for vehicle motion; that the sum of forces calculated in items from 2 to 5 and increased with 10 % because of air resistance.

$$TE = 1,1 \times (RR + GR + FA + DP)$$

RR - force acquired to overcome the rolling resistance;

GR - force acquired to slope upwards;

FA - force acquired to accelerate (acceleration force);

DP - additional tractive effort (trailer).

7. Motor Torque moment: M , lb-in [daNm]

Necessary torque moment for every hydraulic motor:

$$M = \frac{TE \times R_{in} [R_m]}{N \times i \times \eta_M}$$

N - motor numbers;

η_M -mechanical gear efficiency (if it is available).

8. Cohesion between tire and road covering: M_w , lb-in [daNm]

$$M_w = \frac{G_w \times f \times R_{in} [R_m]}{i \times \eta_M}$$

To avoid wheel slipping, the following condition should be observed $M_w > M$

f - frictional factor;

G_w - total weight over the wheels, lbs [daN].

Table 3

Surface	Frictional factor f
Steel on steel	0.15 ÷ 0.20
Rubber tire on polluted surface	0.5 ÷ 0.7
Rubber tire on asphalt	0.8 ÷ 1.0
Rubber tire on concrete	0.8 ÷ 1.0
Rubber tire on grass	0.4

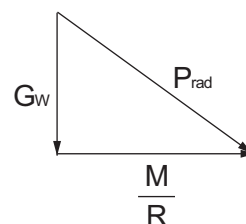
9.Radial motor loading: P_{rad} , lbs [daN]

When motor is used for vehicle motion with wheels mounted directly on motor shaft, the total radial loading of motor shaft P_{rad} is a sum of motion force and weight force acting on one wheel.

G_w - Weight held by wheel;

P_{rad} - Total radial loading of motor shaft;

M/R - Motion force.



$$P_{rad} = \sqrt{G_w^2 + \left(\frac{M}{R}\right)^2}$$

In accordance with calculated loadings the suitable motor from the catalogue is selected.

DRAINAGE SPACE AND DRAINAGE PRESSURE

Advantages in oil drainage from drain space: Cleaning; Cooling and Seal lifetime prolonging.

