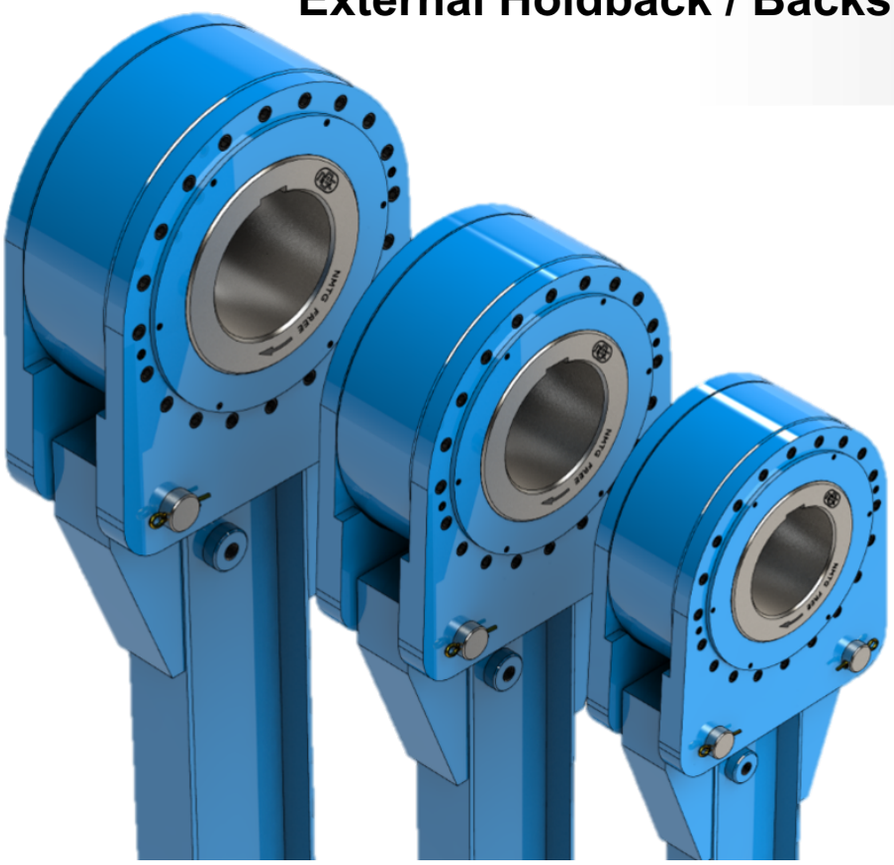
External Holdback / Backstop Clutch
NRHD



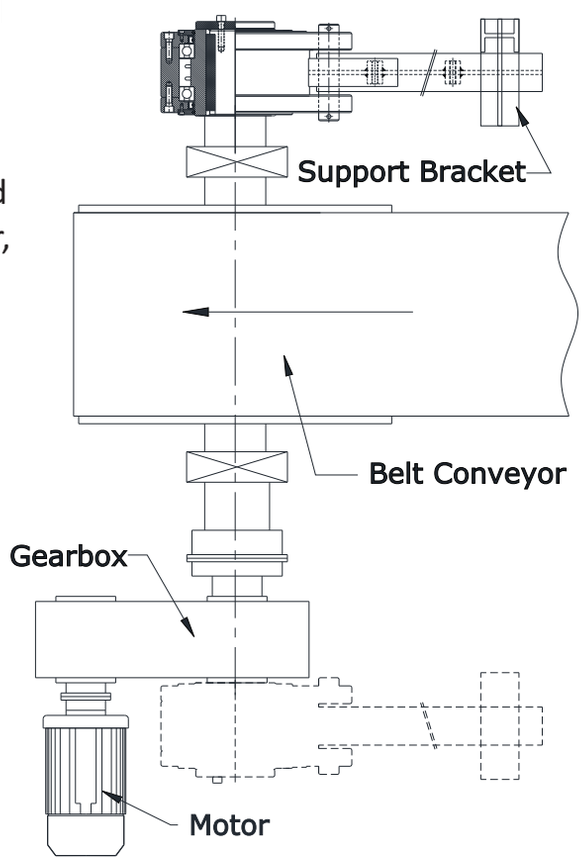
❖ **Features:**

- This type of Freewheel Clutches are Supplied with Lever arm & Sprag with Ball bearings support.
- This type of Freewheel Clutches are designed for use in Low speed Inclined Conveyor, Elevator, etc.
- Requires Oil / Grease Lubrication.
- Bore range: up to 356 mm.
- Transmitting torque: 505700 Nm.

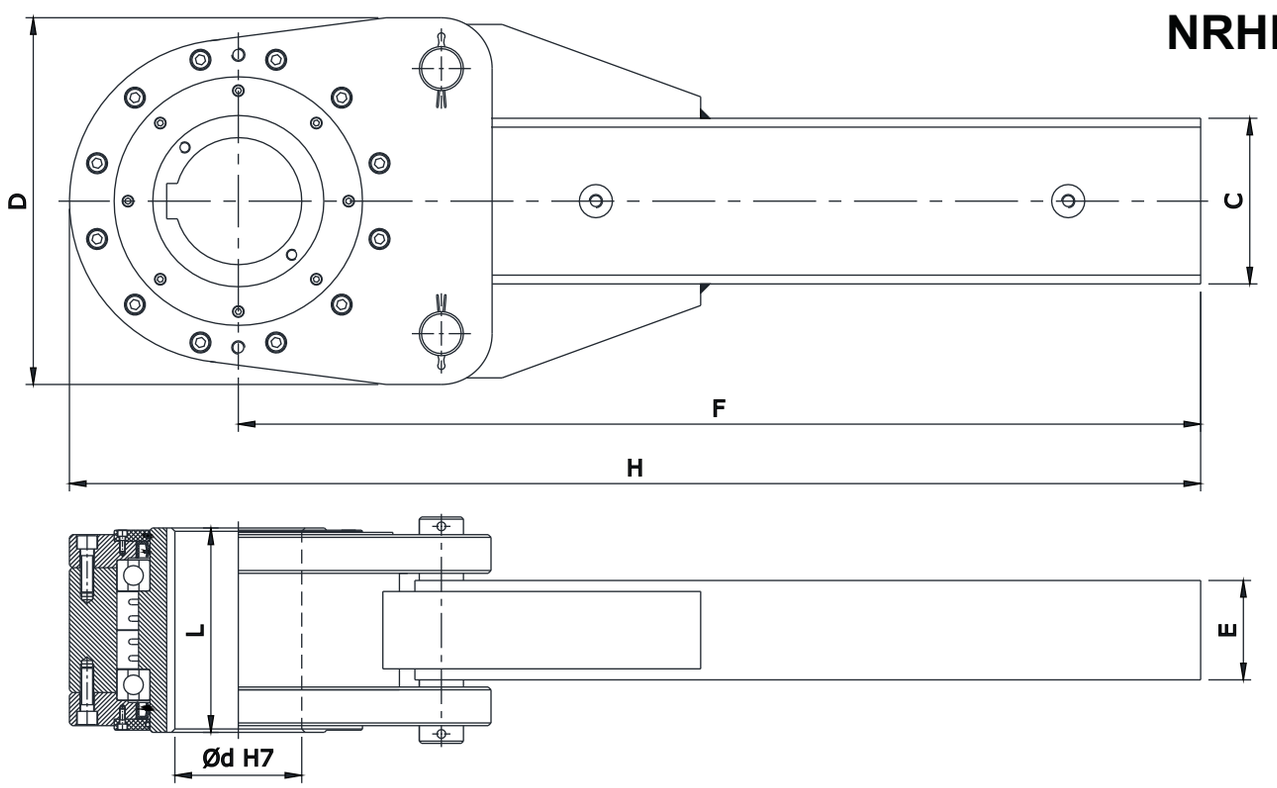
❖ **Mounting:**

- The back driving torque is supported by the Lever arm. The positioning of the lever arm can be adjusted at any angle. The lever arm must not be clamped into position. It must have 12.7 mm play in the axial and in the radial direction.

◆ **Mounting Example:**



NRHD



Model	Max. Over Running Speed Inner Race (RPM)	Nominal Torque (Tn) Nm	Max. Shaft Dia. (d) mm	D mm	C mm	E mm	H mm	L mm	F mm	Weight Kg
NRHD 700	620	5700	85	205	125	70	915	155	813	70
NRHD 775	540	10750	95	250	125	70	1090	195	965	158
NRHD 800	460	16850	115	270	150	75	1100	205	965	185
NRHD 900	400	25200	138	320	150	75	1380	205	1220	245
NRHD 950	360	31200	178	360	200	100	1755	205	1575	270
NRHD 1000	360	40500	178	430	200	100	2045	225	1830	255
NRHD 1100	360	61500	178	430	200	100	2045	255	1830	360
NRHD 1200	250	125000	229	560	250	125	2260	285	1980	595
NRHD 1300	220	149200	254	620	300	140	2415	305	2105	760
NRHD 1400	200	190000	305	770	450	150	2725	330	2390	1106
NRHD 1450	200	257500	305	770	450	150	2725	380	2390	1145
NRHD 1500	200	393200	305	790	450	150	2748	450	2390	1115
NRHD 1600	140	505700	356	830	500	180	3133	490	2745	1545

Notes :

1) Function : Backstopping
2) Tmax = 2 x Tn.
3) Oil / Grease filled, ready to fit.
4) Shaft dia. is to be controlled within h6/j6
5) Keyway as per DIN 6885 - 1.
6) Other sizes on request.
7) All dimensions are in mm.
8) We manufacturing in inch series also.

Ordering Example :

- When ordering please specify bore dia.
- **Example: NRHD 700 - 85 mm Bore Dia.**

Dimensions/Design subject to modifications without any prior intimation.

Hold back / Backstopping Selection Procedure (For Heavy Duty Application):

A : Belt Conveyor (for Short Inclined Yard Conveyor):

1) Calculate the Power to move an Empty Belt & Idlers

$$P1 = 0.06 \times f \times w \times v \times \frac{\ell + \ell_O}{367} \text{ (kW)}$$

2) Calculate the Power to move a loaded Belt horizontally

$$P2 = f \times qt \times \frac{\ell + \ell_O}{367} \text{ (kW)}$$

3) Calculate Power to move the load vertically

$$P3 = \frac{h \times qt}{367} \text{ (kW)}$$

4) Calculate the Back-stop Power

$$Pr = P3 - 0.7 (P1 + P2) \text{ (kw)}$$

5) Calculate the Back-stop Torque

$$T = \frac{9550 \times Pr}{n} \times S.F$$

6) Select the proper Clutch which satisfies the Calculated Back-stop torque

Note:

f = Friction Coefficient of Roller : 0.03 (normally used)

w = Weight of moving parts of conveyor on unload condition (kg/m)

T = Torque (Nm)

V = Velocity of conveyor (m/min.)

qt = Max. load (tons/hour)

h = Total lift (m)

ℓ = Horizontal distance between head pulley and tail pulley (m)

ℓO = Modificant coefficient for **ℓ** : 49 m (Normally used)

n = Shaft revolution per minute where clutch is mounted (RPM)

B : Bucket Elevator:

1) Calculate backstop torque

$$T (Nm) = \frac{9.8 (H+D) \times Qt \times D \times 1000}{120 \times V} \times S.F$$

2) Select the Proper Clutch which satisfies the Calculated Back-stop torque

Note:

H = Total Lift (m)

D = Pitch Circle Diameter of head Sprocket (m)

Qt = Possible maximum load (tons/hour)

V = Velocity of conveyor (m/min)

SF = Service Factor (Refer Page No. - 7)

Use the values from the table below.						
Width of Belt (mm)	400	450	500	600	750	900
Estimated weight (kg/m)	22.4	28	30	35.5	53	63
Width of Belt (mm)	1050	1200	1400	1600	1800	2000
Estimated weight (kg/m)	80	90	112	125	150	160

C : Belt Conveyor (for Long Long Yard Conveyor):

$$T = \frac{7020 \times H}{n} \times s.f$$

$$T = \frac{9550 \times kW}{n} \times s.f$$

Note:

kW = Electric power

H = Horse Power

s.f = Service factor

Hold back / Backstopping Selection Procedure (For Heavy Duty Application):

Service Factor:

Motor Stalled Torque	
Maximum Stalled Torque or Breakdown torque % of Normal Motor Rating	Service Factor
175%	1.17
200%	1.33
250%	1.67
300%	2

Fatigue Loading	
Service Condition	Service Factor
For backstopping 3 - 10 times per day	1.5
For backstopping over 10 times per day	2