1.) General Instruction:-

- Please give full attention to Safety Notes before installation.
- These instructions regarding installation will only valid, if the products meets the selection criteria before installation.
- Ignore & misconception of installation & operation instruction invalidate the product liabilities or warranty by the NMTG Mechtrans Private Limited; same applies if the product id taken apart or changed.

2.) Safety Criteria:

- Installation should be carried out by skilled person only.
- Replacement of any part should be carried out by NMTG only.
- If there is any problem detected in clutch or machine into which it is installed, stop machine immediately.
- Make sure turning forces are not applied to Holdback or turning shaft of the equipment when conducting inspection or maintenance.
- Pay special attention to the backstopping application to prevent accidents.
- Frequent starting and stopping will apply excessive force on the mounting. Verify mounting strength.
- In accurate installation and mounting, various load conditions, wear and tear of parts, and life expectancy can all affect the performance of a Holdback.
- It is necessary to wear Personal Protective Equipment (such as safety shoes, gloves, goggles, etc.) while handling machine in which Freewheel One way Clutch is installed.
- **Confirm rotational direction prior to installing**.

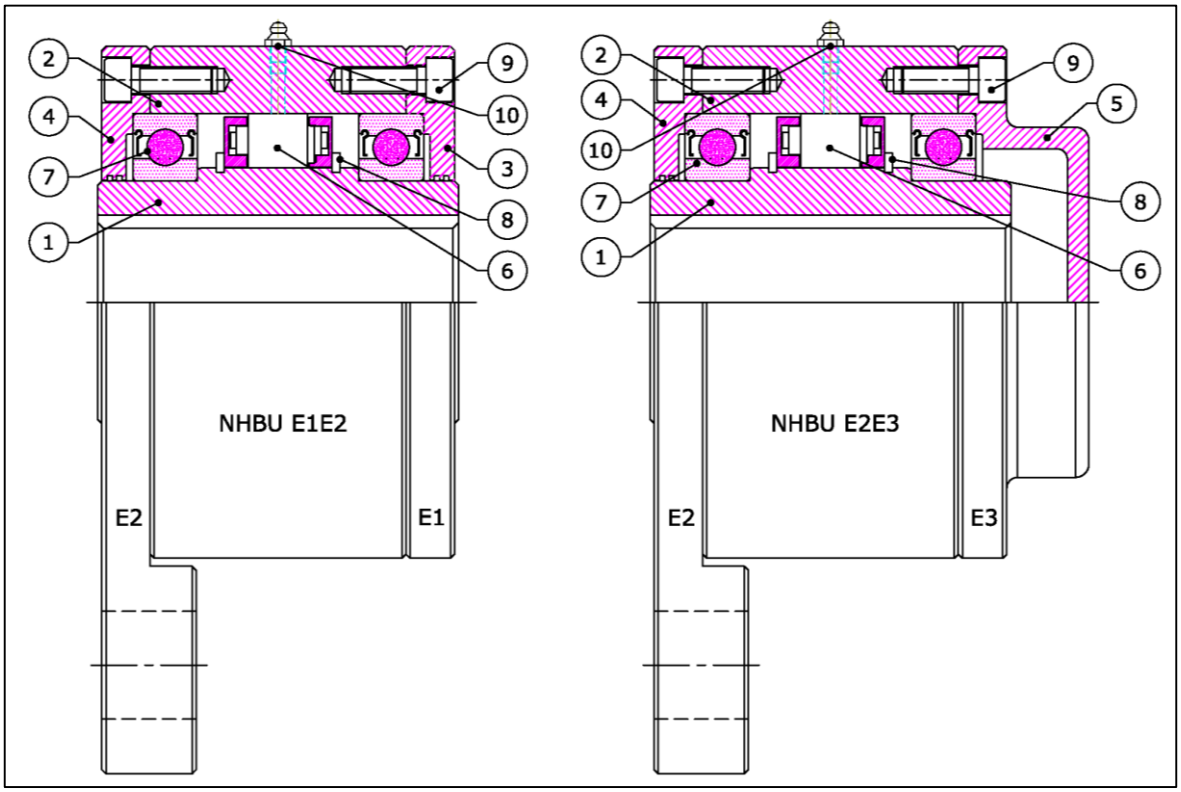
3.) About NHBU E1E2, NHBU E2E3:

- NHBU E1E2, NHBU E2E3 is with shielded type ball bearing support and Centrifugal lift-off sprag (CLS).
- NHBU E1E2, NHBU E2E3 Backstop designed as precision built safety devices to protect Equipment or mounting at where Backstopping function required.
- NHBU E1E2 is Centrifugal Lift-off sprag type clutch having E1 type End cover at one end & E2 type lever arm at another end.
- NHBU E2E3 is Centrifugal Lift-off sprag type clutch having E3 type End closed End cover at one end & E2 type lever arm at another end. This model installed at end of shaft in Mounting.
- NHBU E1E2, NHBU E2E3 Freewheel One-way Clutch assemble on shaft with the inner race driven by a key and secured from axial movement along with shaft length by Circlip, Jack bolt and washer assembly.

4.) Functions of NHBU E1E2 & NHBU E2E3:

- **As a Backstop/Holdback**:
  Backstop function prevent reverse rotation when input drive is discontinue or power supply failure to input drive. Backstop clutch use to prevent damage caused by power supply failure.

5.) Design:



No.	Nomenclature	No.	Nomenclature
1	Inner Race	2	Outer Race
3	E1 type End Cover	4	E2 type lever Arm
5	E3 Type End Cover	6	CLS Assembly
7	ZZ type Bearing	8	Circlip
9	Allen cap Screws	10	Grease Nipple

6.) Pre-Installation:

➢ Shaft-Bore fit:

- Shaft should be free from burs and smooth. The tolerance of the shaft should be h6.
- Provide coating on shaft with anti-seizing agent for easy mounting and easy removal of Freewheel One-Way Clutch.
  Shaft should not tapered and bore are finished to size for an “easy push fit” on a straight shaft.

➢ Key and keyway:

- Check the key fit with both the Freewheel One-way Clutch and shaft.
- To provide for adequate top of key Clearance, the straight keyway in the bore of the Freewheel One-way Clutch has been made slightly deeper than standard.
- Only a parallel key is recommended for Freewheel One-way Clutch fixing. Do not use a tapered key. And there must be clearance between clutch keyway and key top. The key should be in accordance with DIN 6885.1.
- Check key will slide through the backstop keyway and corner radius is clear for fitment.

➢ Axial Retention:

- Freewheel One-way Clutches are manufactured for clearance fit on shafts. So The Inner race must be retained axially on shaft – Circlips are suitable or Jack bolt & washer assembly is used to fix position.

7.) Installation Process:

- Before installation, check if the direction of shaft rotation is the same as the inner race of NHBU E1E2 / NHBU E2E3 Freewheel One-way Clutch, which is shown by an arrow mark on the inner race end.
- Interference fit and shrink fit are prohibited for Freewheel One-Way Clutch fixing.
- Width of key, within js9 & height (refer to shaft dia.) H-t1 (ref. Din 6885 sheet 1). Key must be very carefully fitted to prevent any differential movement.
- Interference fit and shrink fit are prohibited for Freewheel One-Way Clutch fixing.
- Before NHBU E2E3 Installation, First remove screws connection of E3 Cover & remove E3 end Cover from Outer race of Freewheel One-way Clutch.
- When mounting the NHBU E1E2 or NHBU E2E3 Freewheel one-way clutch, apply pressure only on inner race of clutch. When tapping the inner race, use a soft hammer in order to avoid damage on the holdback inner race end. **Do not hit the Clutch side plates to avoid damage of clutch.**
- Axially retained the freewheel clutch on machine shaft. During NHBU E2E3 installed E3 cover clamp back on Freewheel clutch after clutch axially lock on shaft as shown in fig.
- Securely install the lever arm of NHBU E1E2 or NHBU E2E3 Freewheel One-way Clutch. Refer to 'Lever Arm Fixing'.

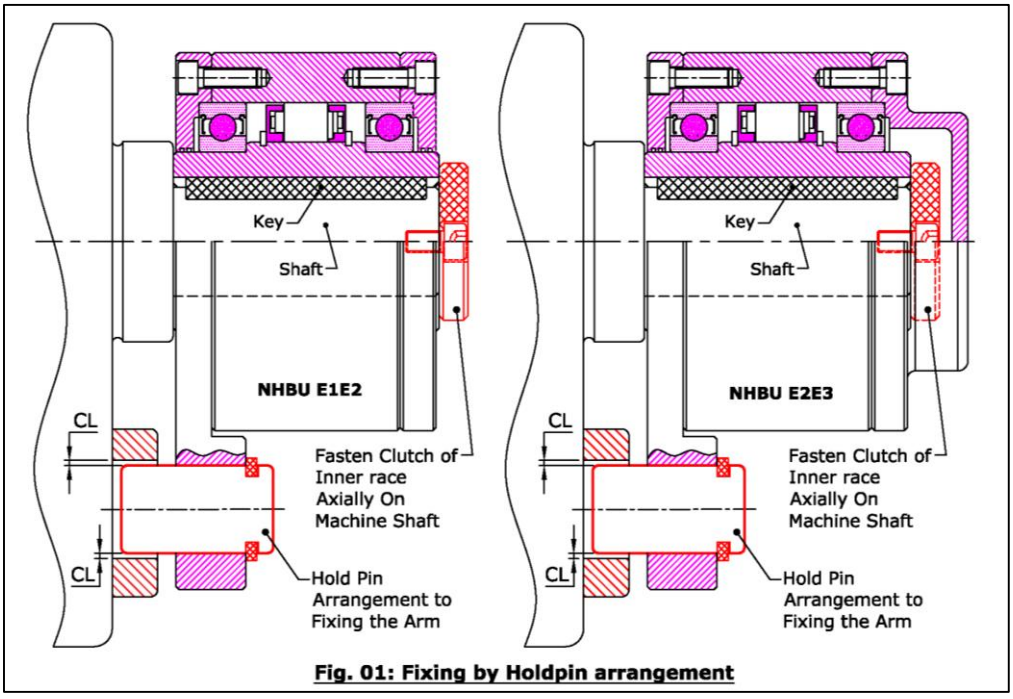


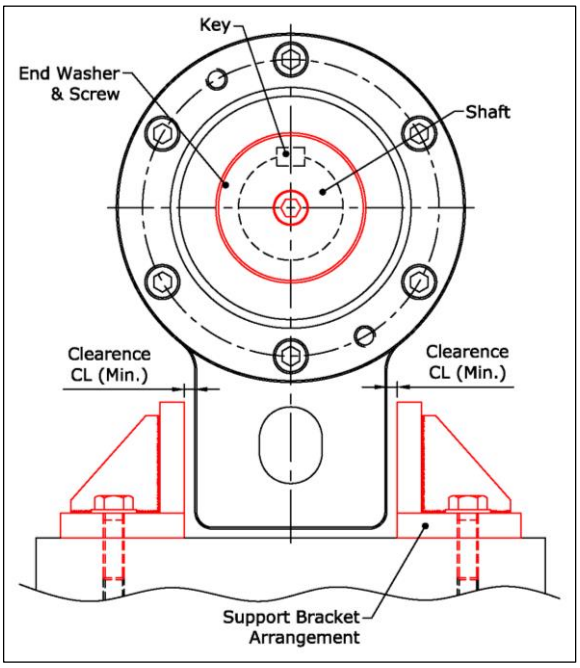
Fig. 01: Fixing by Holdpin arrangement

➢ Lever Arm Fixing by Hold Pin:

- The end of Lever arm shall be restrained to prevent rotation by Hold pin in Lever arm. But the Lever arm shall be free axially and radially in order to prevent the clutch from any load induced by misalignment and distortion.
- Lever arm pin should protrude into a rigid support & must have axial clearance. Hold pin in the torque arm must have a radial clearance of 1-3% of Hold pin's diameter.

➢ **Lever Arm Fixing by Support Bracket:**

- The end of Lever arm shall be restrained to prevent rotation by a set of angle iron. But the Lever arm shall be free axially and radially in order to prevent the clutch from any load induced by misalignment and distortion.
- Supporting brackets of Lever arm shall be welded to the conveyor frame in order to install the Lever arm correctly, and allow 10 mm clearance (CL) between Lever arm and supporting bracket.
- By placing rubber sheet at support bracket, initial noise at starting can be avoided.



8.) Change in direction

- Change of the direction of rotation is achieved by exchanging lever arm and cover.

9.) Lubrication & Maintenance:

- Periodic change of grease is necessary after 7,500 to 10,000 hours of operation. The actual operation time between changes should be decided after considering the operating conditions. Inject new grease after draining and cleaning inside of the NHBU E1E2 freewheel clutch. When the grease is to be changed, be sure to drain and clean the inside of the NHBU E1E2 freewheel clutch.
- Every two years, the freewheel should be dismantled, cleaned, inspected and re-lubricated.
- Uninstall the unit as an assembly.
- After removing the covers, carefully remove the inner race, bearings and cage from the outer race.
- Clean all parts and examine them visually.
- On reassembly approximately $^{1}/_{3}$ of the cage should be filled with grease. Apply grease particularly to the sprags and the inner diameter of the outer race.
- Reassemble unit following the guidelines in the Re-Installation of cage assembly, ensuring grease is applied to the grease pockets recessed into the inner diameter of the cover plates.
- Complete installation as described in the installation section.
- Grease sampling should be taken @ regular 12 month intervals depending on environmental & contamination conditions. Additional grease replacement might be needed during sampling if excessive liquid is removed, replace at least 50% more by volume than lost.

(Note: Don't use grease which contains EP additives.)

Temp. Range	**-20°c to +80°c**
Manufacturer	**Grease**
OKS	OKS 475
AGIP	AGIP GR MU 2
ARAL	ARALUB HL2
BP	ENERGREASE LS2
CASTROL	CASTROL BNS
KLUBER	ISOFLEX LDS 18 SPECIAL A
MOBIL	MOBILUX EP2
TEXACO	TEXANDO FO 20
INDIAN OIL	SERVOGEM 2 , SERVOGEM 3

10.) Preservation & Storage Instruction:

- NMTG Product is supplied with an oil film as Rust & Corrosion Protection as per below instruction for Short term storage.
- This protection is renewed at regular intervals which depends on Environmental condition at Storage site. (Temperature, Atmosphere, etc.)
- **Maximum Storage period is 6 Months for Short-term Storage**.

Please follow Instruction for Preservation & Storage of NMTG Products:

- Once NMTG Product is used then clean all its parts with clean cloth.
- Lubricate all parts with rust preventive oil S-VCI 415 or equivalent & assemble as it was & packed in plastic bag.
- After wrapping in plastic bag, Material is packed by S-VCI 131 or equivalent rust preventive paper & store.
- Keep it in dry place and free from dust.
- Do not expose to open or corrosive environment.
- Keep away from direct Sunlight.
- Avoid Mechanical Shock & Vibration.
- Storage Temperature: -10 to +60°C.
- Relative Humidity: Maximum 95%, non-condensing.

For Long term Storage (1 Year):

Please follow Instruction for Preservation & Storage of NMTG Products:

- Once NMTG Product is used then clean all its parts with clean cloth.
- Lubricate all parts with rust preventive oil S-VCI 415 or equivalent & assemble as it was & packed in special Vacuum bag.
- After wrapping in Vacuum bag, Material is packed & store.
- Keep it in dry place and free from dust.
- Do not expose to open or corrosive environment.
- Keep away from direct Sunlight.
- Avoid Mechanical Shock & Vibration.
- Storage Temperature: -10 to +60°C.
- Relative Humidity: Maximum 95%, non-condensing.