

Safety, Installation & Service Instructions For DRAG CONVEYORS

Warning: Important information contained in this manual to be reviewed and followed by contractor, installer, owner and operator.

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SCC warrants that the equipment of its manufacture is free from defects in material and workmanship at the time of shipment and for a period of one year after shipment to the original purchaser. SCC will repair or replace, at SCC's option, any product of SCC's manufacture which is shown to SCC's satisfaction to have been defective at the time it was shipped, provided the product claimed defective is made available for Screw Conveyor Corporation's inspection within ten days after the Purchaser gains knowledge of the purported defect. Re-shipping method shall be at SCC's option. SCC shall not be responsible for the cost of disassembly or assembly at the job site if there is a claim made under this limited warranty. This warranty will terminate upon the earlier of: 1) damage or deterioration due to use or misuse, exposure, alteration, or negligence; 2) products that have been altered or repaired by others without SCC's express written consent; or (3) equipment manufactured by others and included in our proposals.

SCREW CONVEYOR CORPORATION EXPRESSLY DISCLAIMS LIABILITY FOR ANY EXPENSES, INJURY, LOSS OR DAMAGE WHETHER DIRECT OF CONSEQUENTIAL, INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, PRODUCTION, INCREASED COSTS OF OPERATION, SPOILAGE OF MATERIALS OR ANY DELAY ARISING IN CONNECTION WITH THE USE OR INABILITY TO USE THE PRODUCTS FOR ANY PURPOSES.

INTRODUCTION:

This manual contains instructions for the Safety, Installation, Operation and Maintenance of drag conveyors as manufactured by Screw Conveyor Corporation (SCC). The reliability and good service life of this equipment depends to a very large extent on the care taken in installing and otherwise preparing this equipment for its intended use.

Read all instructions in this manual and Manufacturer's manuals shipped with equipment **BEFORE** installing, testing, operating and maintaining the equipment.

Some drag conveyors are ordered and manufactured based on catalog information and engineering drawings are not required. Many others however are provided with drawings. Some are purchased with the requirement that assembly and detailed drawings are needed in order to produce the unit to accommodate a specific application. The drawings therefore serve the purpose of describing to the buyer or installer exactly what is being furnished and this enables the buyer or installer to determine more specifically what other equipment is needed to connect to the input of the drag conveyor as well as connect to the discharge from it. Drawings are not however considered design drawings for the concept of a process or system.

There are several kinds of drag conveyor product lines discussed in this manual.

1. Enduro-Flo® Drag Conveyor -- Model SD, Type H
2. Enduro-Flo® Drag Conveyor -- Model SD, Type C
3. Enduro-Flo® Drag Conveyor -- Model HD, Type H
4. Enduro-Flo® Drag Conveyor -- Model HD, Type C
5. Super-Flo® Drag Conveyor -- Inclined or Horizontal

The instruction for erecting any of these drag conveyors is generally the same.

SAFETY RESPONSIBILITY:

Electrical controls, machinery, guards, railings, walk-ways, arrangement of installation, training of personnel, etc. are necessary ingredients for a safe working place. It is the responsibility of the contractor, installer and owner/user to supplement the materials and services furnished by SCC with these necessary items to make a safe working environment and comply with applicable laws.

SAFETY:

Most accidents involving property damage or personal injury are the result of someone's carelessness or negligence. In order to avoid such accidents, one of the many things that must be done is to make machinery that eliminates in so far as possible an unsafe or hazardous condition. Drag conveyors must be installed, maintained and operated with the following minimum provisions:

1. Drag conveyors shall not be operated unless the conveyor housing completely encloses the moving elements and all power transmission guards are in place. The following warning signs (see CEMA Safety Label Sheet SC-1) are attached to all conveyor housings in locations as specified. Signs should not be removed from housings or be painted over! Replacements can be ordered from the Conveyor Equipment Manufacturer's Association (CEMA).
2. Do not overload the conveyor or use it for anything but its intended use.
3. Feed openings for shovel or other manual or mechanical equipment shall be constructed in such a way that the conveyor rotating and moving parts are enclosed and restricts access to conveyor.
4. Always lock-out power before doing maintenance.

SCC does not perform electrical design services and therefore does not supply electrical devices unless specifically instructed to do so by the purchaser.

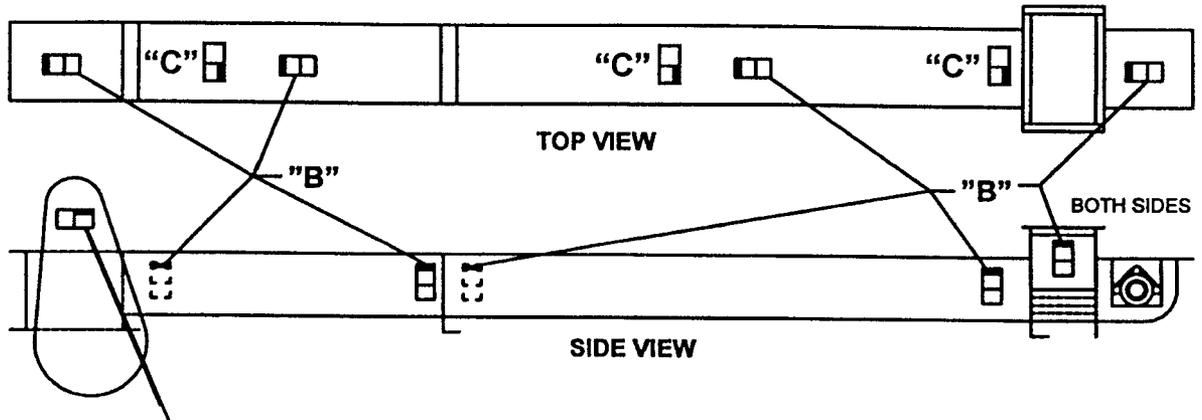
SCC will try to assist, to the best of our ability, in the selection of the devices or equipment that will aid the owner and installer in preparing a safe installation and a safe working place. Zero speed switches and other electrical devices can sense conveyor operation so that operations can be interrupted and/or alarms can be actuated.

There are many kinds of electrical interlocking devices for conveyors, elevators and conveyor systems such that if one conveyor in a system or process is stopped, other equipment feeding it or following it can also be automatically stopped and thus prevent overloading at transfer points. For the safety of those that will come into the area where this equipment will be operating we recommend that you contact an electrical designer and/or supplier. Provide them with information on your operating conditions so they can best recommend and supply the appropriate devices.

Product: Screw Conveyors

Revised December, 1999

Equipment: Drag Conveyor



WARNING
Exposed moving parts can cause severe injury
LOCK OUT POWER before removing guard
CHR930001

"A"

To be placed on removable guards to warn that operation of the machinery with guards removed would expose chains, belts, gears, shafts, pulleys, couplings, etc. which create hazards

To be placed on inlets and discharges, troughs, covers, and inspection doors of screw conveyors to provide warning against exposed moving parts while in operation.

WARNING
Walking or Standing on Conveyor Covers or Gratings can cause Serious Injury or Death
DO NOT STAND or WALK on COVERS or GRATINGS - STAY OFF
CHS990026

"C"

USE LABEL "A" ON BELT GUARD
USE LABEL "B" ON ENDS OF TROUGH, MIDDLE OF COVERS AND AT INLET OPENING.
USE LABEL "C" ON TOP OF COVERS

- NEAR SIDE
- FAR SIDE

WARNING
Exposed conveyors and moving parts can cause severe injury
LOCK OUT POWER before removing
CVS930010

"B"



SCREW CONVEYOR CORPORATION

SAFETY LABELS

INFORMATION AND PLACEMENT GUIDELINES

Safety is a prime consideration in the design, manufacture, installation, use and maintenance of conveyors. It is well recognized that in many instances, safety labels can increase operator and maintenance personnel awareness of the inherent hazards involved in conveyors or other types of moving equipment.

The process of designing and installing conveyors should be supervised by qualified personnel. The operation and maintenance of conveyors should also be performed and supervised by personnel trained to safely do so.

The purpose of this program is to provide guidelines for the selection and application of safety labels for use on conveyors and related material handling equipment. As part of the conveyor users' comprehensive safety program, the users of conveyors shall inspect and review safety labels to insure their integrity and maximize their effectiveness in injury prevention.

ANSI 535.4-1991

CEMA SAFETY LABELS

4.15 SIGNAL WORD:

The word or words that designate a degree or level of hazard seriousness. The signal words for product safety signs are DANGER, WARNING and CAUTION.

4.15.1 DANGER:

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

4.15.2 WARNING:

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

4.15.3 CAUTION:

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

NOTE: DANGER or WARNING should not be considered for property damage accidents unless personal injury risk appropriate to these levels is also involved. CAUTION is permitted for property-damage-only accidents.

SAFETY LABELS CAN BE OBTAINED FROM:

Conveyor Equipment Manufacturers Association

5672 Strand Ct., Suite 2

Naples, FL 34110

Telephone: (239) 514-3441

Web Site: www.cemanet.org

INSTALLATION

Receiving:

Check all assemblies and/or parts with shipping papers. Inspect for damage and specifically check for dented or bent troughs and covers. If any components are damaged in transit shipping papers should be so noted and claims should be filed immediately with the carrier.

Assembly:

Once it is determined that all materials have been received, place conveyor sections in proper sequence where the equipment is to be installed. Starting with the tail terminal, and continuing on with the divided flow inlet/trough inlet, trough sections and drive terminal/discharge, make sure they are properly located in accordance with the match-marking procedure (see Figure #1). If shipment consists of more than one unit each part will have the unit number in addition to the match-marking (see Figure #1).

ENDURO-FLO® DRAG CONVEYORS

Horizontal Type Units (Type H, Model SD or HD):

Remove trough covers and, only when necessary, the return rails. Connect trough flanges loosely (do not tighten bolts at this time). Align trough bottoms with adjoining section(s) and tighten flange bolts. Follow the same procedure with both side flanges of trough. Next, tighten all floor/conveyor support anchor bolts.

After troughs are aligned and all bolts are tightened, install the bottom run of chain and flights so that the flight is pushing the material (see Figure #2). Re-install the return chain rails (if removed earlier). Align rails with adjoining section. (Note: Return rails have slotted adjustments in troughs for alignment purposes.)

Compartment Type Units (Type C, Model SD or HD):

Remove trough covers and, only when necessary, compartment trough inserts. Connect trough flanges loosely (do not tighten bolts at this time). Align trough bottom with adjoining section(s) and tighten flange bolts. Follow the same procedure with both side flanges of trough. Next, tighten all floor/conveyor support anchor bolts.

After troughs are aligned and all bolts tightened, install bottom run of chain and flights so that the flight is pushing the material (see Figure #2).

Re-install compartment trough inserts (if removed earlier) and align the inserts with adjoining sections. (Note: Customer may want to tack-weld these adjoining sections together to keep proper alignment.)

SUPER-FLO® DRAG CONVEYOR

Place conveyor troughs in proper sequence with rounded contour, divided flow inlet and take-up drive terminal with discharge properly located as per Fig. No. 1, indicating the match-marking procedure.

Remove trough covers.

Connect trough flanges loosely. Do not tighten bolts. Align the trough bottom center-lines perfectly using piano wire (or equivalent). Tighten flange bolts. Tighten all anchor bolts.

After troughs are aligned and all bolts tightened install the chain and flights so that the flight is pushing the material as illustrated in Fig. No. 3.

Before connecting top section of chain loosen take-up as much as possible. Check sprocket alignment, set screws, and bearing mounting bolts for tightness. Now connect top section of chain. Adjust take-up to remove excess slack from chain, being sure that adjustment screws have been tightened equally to prevent any misalignment.

Install trough covers in proper sequence. Handle covers with reasonable care to avoid warping or bending.

Attach covers to trough with fasteners provided.

Install drive at proper location and in accordance with separate instructions provided.

Check for proper direction of chain and flight travel after electrical connections have been made, but before attempting to handle material.

If necessary, reconnect electrical leads to reverse rotation of conveyor in direction of material flow.

Final Assembly:

Once the return system is installed and properly aligned, loosen chain take-ups as much as possible. Check both tail and drive sprocket alignment with each other (see Figure #4). Also check set screws (sprocket and bearings) and bearing mounting bolts for tightness in tail and drive terminal. Now install the top section of chain and flights. Connect the top and bottom sections of chain. Adjust take-ups to remove excess slack in chain (some chain links may need to be removed), being sure that adjustment screws have been tightened equally to prevent any misalignment.

Install trough covers in proper sequence keeping the batten in the proper direction. Handle covers with care to avoid warping or bending. Attach covers to troughs with fasteners provided.

Install drive package at proper location and in accordance with separate drive instructions provided. NOTE: Reducers are shipped without oil. Check that all bearings are lubricated (see below).

Check for proper direction of chain and flight travel after electrical connections have been made, but before putting product into the conveyor.

If necessary, reconnect electrical leads to reverse rotation of motor to provide proper direction of travel of the conveyor.

Run the conveyor dry (without product) for a period of time (as indicated in this manual). Check for alignment. Re-adjust take-ups and make sure all connections are fastened and tightened properly.

Bearings are normally lubricated at the factory with a Shell Aluania #2 grease for sizes up to 5" bore and above a 5" bore with Mobil Mobilux #2EP. Re-lubricate with lithium-base grease or a grease which is compatible with original lubricant and suitable for bearing service.

LUBRICATION GUIDE

(Read Preceding Paragraphs Before Establishing Lubrication Schedule)

Hours	Suggested Lubrication Period in Weeks					
	1 to	251 to	501 to	751 to	1001 to	
Run	250	500	750	1000	1500	
Per	RPM	RPM	RPM	RPM	RPM	
Day						
8	12	12	10	7	5	
16	12	7	5	4	2	
24	10	5	3	2	1	

START-UP:

After the drag conveyor has been erected and braced and the take-ups adjusted to provide proper tension to the chain, the conveyor should be run without load for approximately eight (8) hours. During this time, particular attention should be directed to the following:

1. Loud or unusual noise.
2. Excess vibration.
3. Bearings over-heating.
4. Drive unit over-heating.
5. Evidence of contact or scrubbing between inside of sidebars and sprockets.

None of the previous should be present if all installation instructions in this manual were followed.

Things to look for if any of the above conditions are present:

1. Loose flights and possibly trash material or tools present inside the conveyor.
2. Drive equipment inadequately braced. Chain alignment and alignment of head and tail shafts.
3. Bearings inadequately lubricated. Extreme shaft(s) mis-alignment. Too severe overhung load on headshaft. Take-ups too tight.
4. Reducer inadequately lubricated. Improperly wired motor or incorrect voltage going to motor.
5. Chain mis-alignment due to shafts being out of plumb. Take-ups not equally adjusted or head bearings not equally shimmed (shafts not level).

It is also suggested that the hold back device (backstop, if furnished) be tested at this time. While the unit is operating, turn off the power and check the holding action of the device. It should grab immediately without allowing the chain and flights to reverse their direction of travel.

Before starting normal operation, the chain should be rechecked for tightness. Adjustments may have to be made. Check the structural bracing to make sure that the conveyor is secure and level under all conditions of use. All flight bolts should be checked and re-tightened if necessary.

STOP

DRAG CONVEYORS ARE DESIGNED TO TRAVEL TO A SPEED AND CAPACITY ADAPTABLE TO THE TYPE OF MATERIAL BEING CONVEYED. DO NOT MAKE ANY CHANGES IN MATERIAL, MATERIAL SIZE, MOISTURE CONTENT OR SPEED OF TRAVEL WITHOUT FIRST CONSULTING SCREW CONVEYOR CORPORATION!

The operator(s) should become familiar with all aspects of the construction and normal operating conditions of the equipment. Operator can, therefore, immediately recognize an abnormal situation or operating condition before any serious damage occurs.

Assuming a correct and level installation of the unit, the drag conveyor should be started with the unit empty. Starting under load places undue strain on chain and drive machinery. It is imperative to allow all flight compartments to empty before stopping the conveyor.

Material should be centrally delivered at the specified uniform rate. Avoid loading to the extent that material spills back down into the tail section. The tail section itself must not be allowed to pile up with spilled material.

The conveyor should be operated at its rated speed.

Before any conveyor is placed into full operation or "put on the line", it should have been "run-in" during which time we:

- Listen for -- Loud or unusual noises.
- Look for -- Excess vibration.
- Feel for -- Overheated bearings or drive units.

Maintenance:

Once the unit is placed into full operation, a Preventative Maintenance Program should begin. This program should include regular inspection set up on a periodic basis.

The Preventive Maintenance Program should include a general inspection of:

- ✓ Chain and flights for possible damage or loose bolts.
- ✓ Adjust take-ups for proper tension.
- ✓ Re-lubrication schedule.

Other items to be routinely inspected:

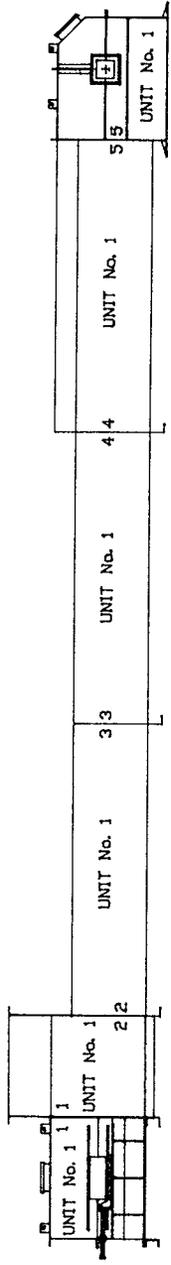
- ◆ Conveyor chain
 - ✓ Check side bars. Side bar inner faces should be checked for wear. This is an indication of mis-alignment.
 - ✓ Check for missing cotters. Missing cotters permit pin backoff.
 - ✓ Check for insecure pins. Loose or unseated pins are danger signals and could lead to sudden and unexpected shutdown.
 - ✓ Check lubrication. See lubrication chart (Page 7).
 - ✓ Check excess material build-up. Excess material building up in chain and attachments will prevent proper seating on sprockets and contribute to a shortened conveyor life. Result: Accelerated chain and sprocket wear.
 - ✓ Check for rounded parts indicating wear.
 - ✓ Check sprockets for wear. Sprockets may show evidence of cupping or other wear marks.

- ◆ Bearings
 - ✓ Check operating temperature, signs of wear (noise) and lubrication.

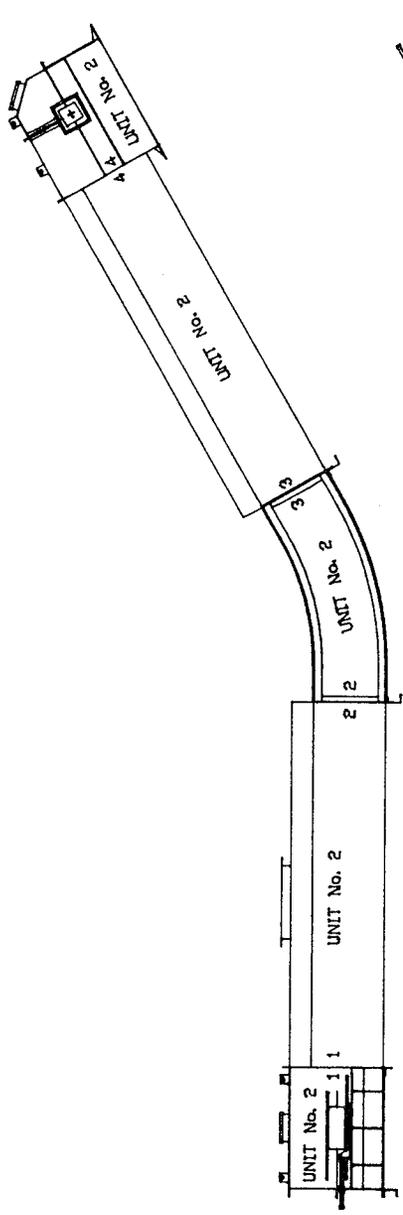
- ◆ Drives
 - ✓ V-belts of V-belt drives for wear on belts and proper tension.
 - ✓ Roller chains of chain drives for lubrication and proper tension.
 - ✓ Oil in gearbox.

Practice good housekeeping. Keep the area around the drag conveyor and drive equipment clean and free of obstacles to provide easy access and to avoid interference with the function of the conveyor and drive.

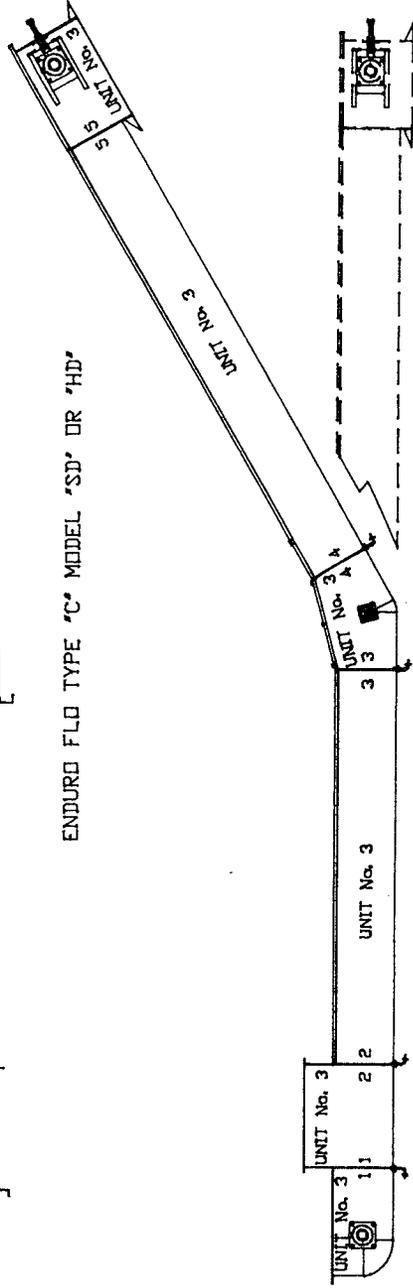
Replacement parts can be identified from a copy of the original shipping list, invoice or drawing.



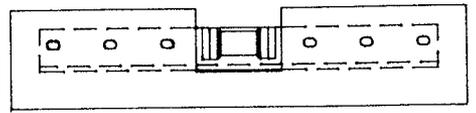
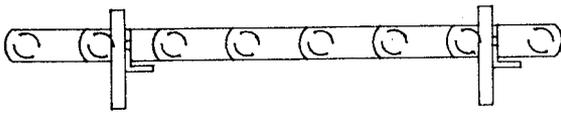
ENDURO FLO TYPE 'H' MODEL 'SD' OR 'HD'



ENDURO FLO TYPE 'C' MODEL 'SD' OR 'HD'

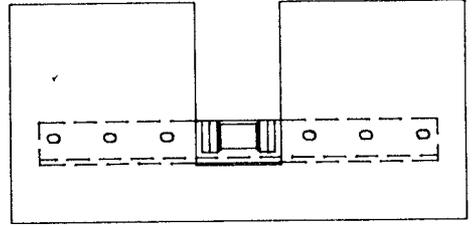
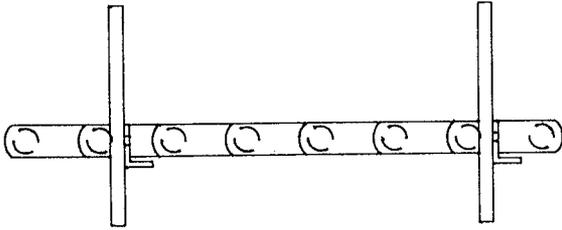


SUPER-FLO INCLINED OR HORIZONTAL



← BOTTOM CHAIN TRAVEL

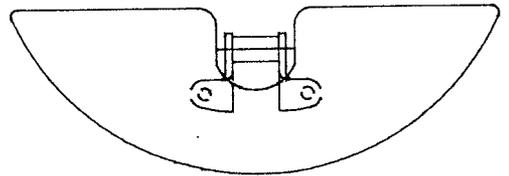
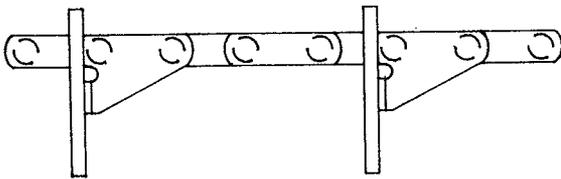
ENDURO FLD TYPE "H" MODEL "SD" OR "HD"



← BOTTOM CHAIN TRAVEL

ENDURO FLD TYPE "C" MODEL "SD" OR "HD"

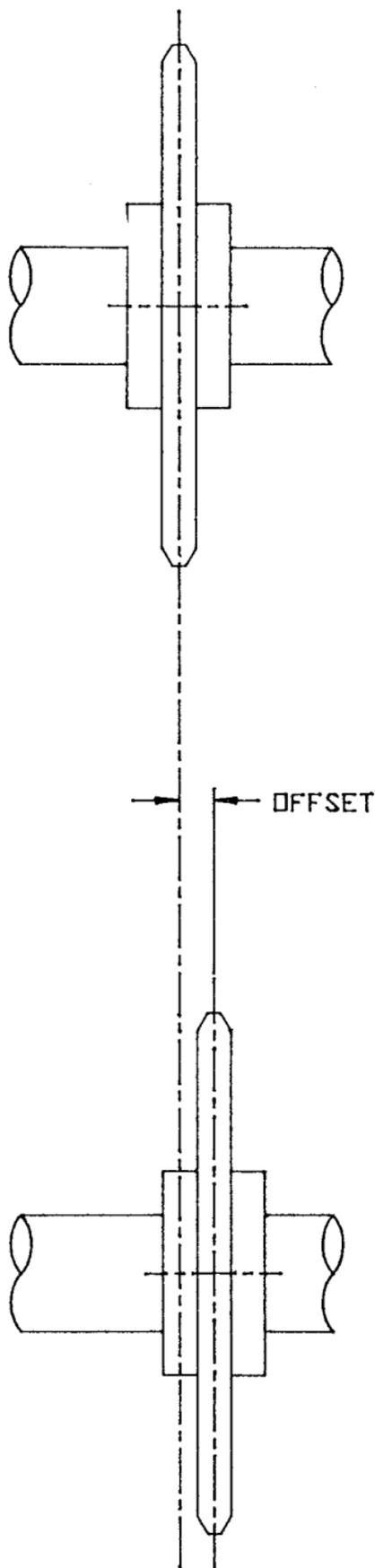
FIGURE No. 2



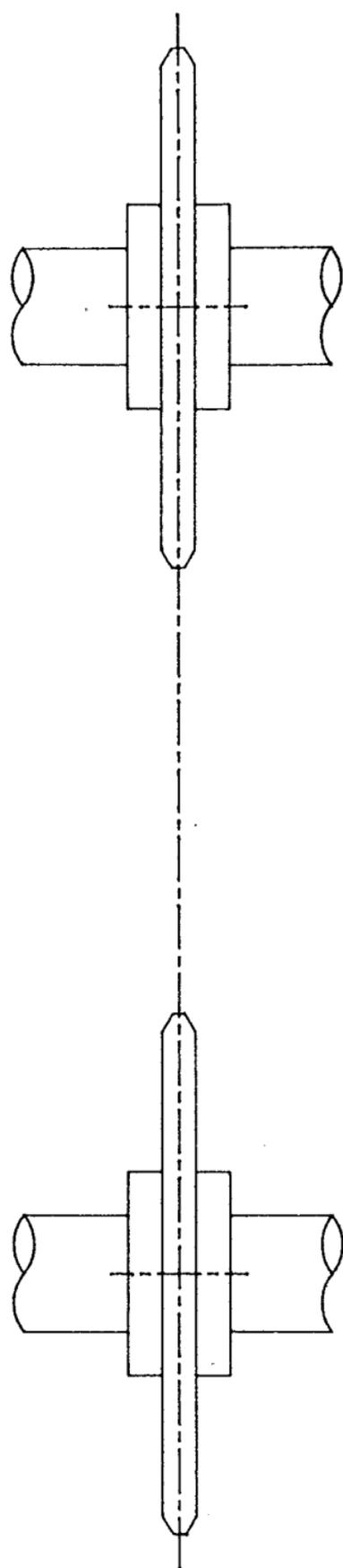
← BOTTOM CHAIN TRAVEL

SUPER-FLD INCLINED OR HORIZONTAL

FIGURE No. 3



IMPROPER
ALIGNMENT



PROPER
ALIGNMENT

FIGURE No. 4