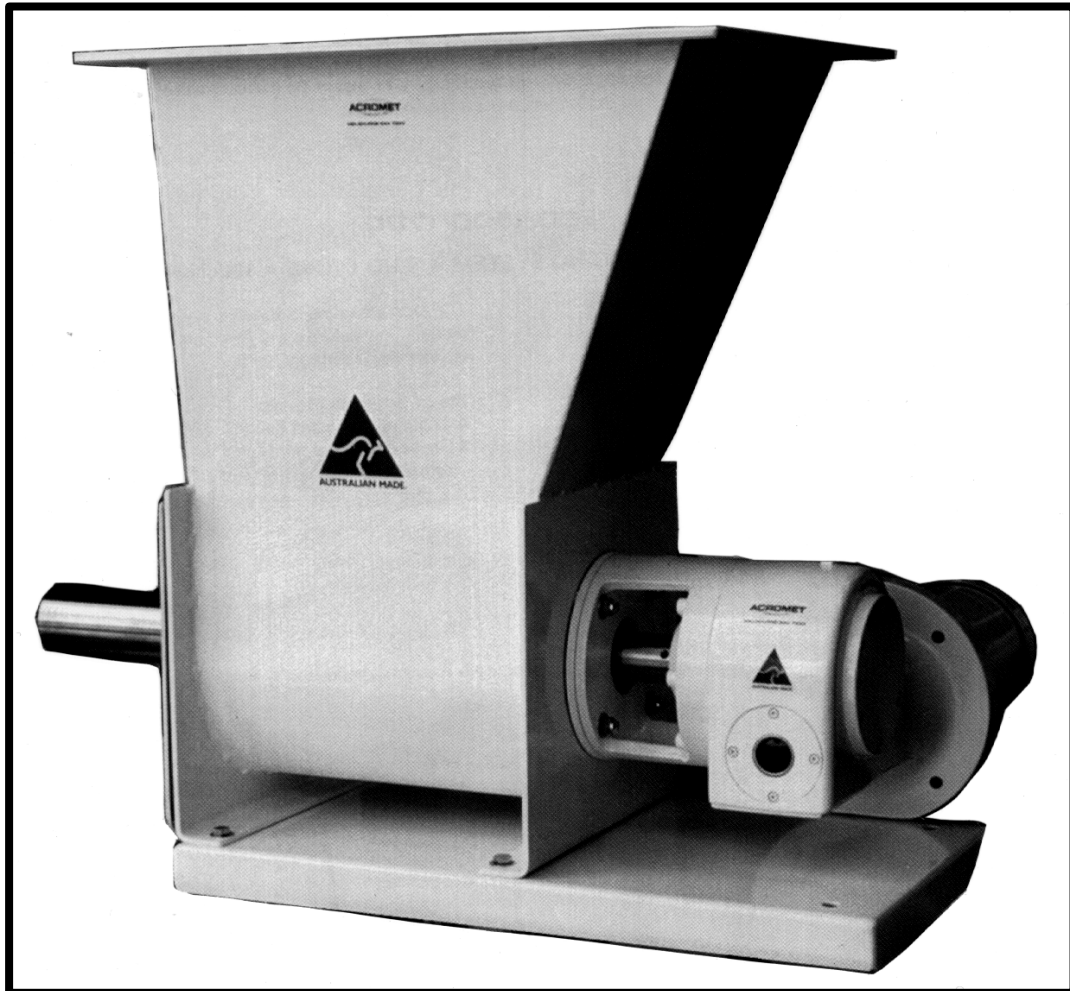


MODEL 1501X DRY MATERIALS FEEDER



OPERATION AND MAINTENANCE MANUAL

Contents

1.	INTRODUCTION	1
2.	SAFETY PRECAUTIONS	2
2.1.	General.....	2
2.2	Mechanical Precautions:	2
2.3	Electrical Precautions:	2
3.	INSTALLATION	3
4.	CALIBRATION AND OPERATION	4
4.1	Calibration.....	4
4.2	Operational Adjustments.....	4
5.	MAINTENANCE	5
5.1	General Care.....	5
5.2	Drive Motor (1)	5
5.3	Controller (A.C. or D.C.).....	5
5.4	COAXOR Gear Drive Unit.....	5
5.5	Shaft Seal Assembly (Fig. 2).....	6
6.	DISMANTLING PROCEDURES	6
6.1	Feeder Removal.....	6
6.2	Tube Plate Removal	6
6.3	Metering Auger Removal.....	7
6.4	Conditioning Device Removal.....	7
6.5	COAXOR Gear Drive Unit (Item 4).....	7
6.6	Seal Assembly : Auger Drive Shaft Conditioning Drive Shaft	8
6.7	Re-Assembly of the COAXOR Gear Drive Unit	10
FIG. 1	GENERAL ASSEMBLY	13
FIG. 2	SEAL ASSEMBLY	15

1. INTRODUCTION

Your Acromet Model 1501X Volumetric Feeder is a Medium Duty Dry Material Feeder employing the unique Acromet designed Compact COAXOR (Patents pending) Gear Unit. The COAXOR Gear Drive Unit with the appropriate Auger and Conditioning Drive attached provides unequalled principles of material control with exceptional metering accuracy.

Versatility of design makes provision for the application of a variety of auger systems and other features, the selection of which is dependent on the characteristic of the product to be handled and the ease of otherwise with which an acceptable degree of feed rate accuracy is achieved.

There are over thirteen (13) Metering Auger sizes available in the range for the Model 1501X Feeder. Metering Augers, Discharge Cylinders and Conditioning devices are interchangeable. Should your production requirements change, please contact Acromet regarding modifications to suit your needs.

The Model 1501X Volumetric Feeder is both rugged and reliable, featuring a simple clean self-supporting design that will give long service life with the minimum of maintenance.

The Model 1501X Dry Material Feeder is a very adaptable unit. As a chamber only design, it can be attached to your hopper. It can be provided with an integral or bolt on hopper and, when utilised with gravimetric control equipment, the Model 1501X Feeder is unsurpassed as an accurate, continuous or batching Weigh Control Differential Feeder, in either industrial or laboratory conditions.

Again, please contact Acromet for further advice or modifications for your Model 1501X Dry Material Feeder.

2. **SAFETY PRECAUTIONS**

Please read and familiarise yourself with all Sections of this and other Equipment Manuals before proceeding with installation.

2.1. **General**

- Observe all standard precautions that apply to moving machinery.
- Observe all standard precautions that apply to electrical equipment, drives and controls.
- Pay particular attention to special safety "cautions" and "notes" in all Manuals.

2.2 **Mechanical Precautions:**

Prior to undertaking any mechanical maintenance, repairs, installation etc:

- **SWITCH OFF**, and disconnect power before proceeding.
- Remove and/or lock switch in the "**OFF**" position.
- Ensure Feeder infeeds and discharges are closed off to prevent feed material from contaminating personnel and equipment.
- Take precautions to protect openings to moving components and prevent the ingress of loose tools or parts.
- Personnel must wear the appropriate protective safety attire and remove loose clothing, jewellery, etc.

2.3 **Electrical Precautions:**

Before undertaking work on the electrical controls or drives;

- **DISCONNECT POWER** and place a notice to advise others of the type of work in progress.
- Ensure all necessary grounds are in place and solid.
- **DO NOT** disconnect or disable ground connections.
- Follow all electrical regulations as required by electrical engineering trades.

3. INSTALLATION

3.1 Install the Feeder on a level surface. Use bolts or masonry anchors which remain below and flush with foundation or support. This will allow the Feeder to slide out for maintenance if Conditioning Chamber is to be bolted under a large permanent hopper.

NOTE: Operations 3.2 and 3.3 must be carried out by a Qualified Electrician.

3.2 Connect the drive motor/s (1) to the electrical supply. The type of drive used is often decided by customer preference and may be either:

3.2.1 Fixed speed motor.

3.2.2 Fixed speed motor operated by a timer.

3.2.3 Fixed speed A.C. Motor controlled manually or automatically by variable frequency inverter to vary the speed.

3.2.4 D.C. Variable Speed Motor controlled manually or automatically by SCR Controller.

WARNING: DO NOT OPERATE THE FEEDER WITH THE FEED TUBE REMOVED OR PLACE HANDS OR ANY OTHER OBJECT WITHIN HOPPER AREA WHILST FEEDER IS IN OPERATION. THERE IS A HIGH RISK OF INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT

3.3 Check the Feeder rotation by a short run. The rotation **MUST BE CLOCKWISE** when facing the tube plate or damage to the Feeder will occur. Change the power leads in the motor terminal box to reverse the direction of rotation. Product discharge from the Feeder must fall freely and not be restricted in any way.

3.4 Ensure the Breather Plug is fitted to the topmost surface of the COAXOR Gear Drive Unit.

4. **CALIBRATION AND OPERATION**

4.1 **Calibration**

Fill the Conditioning Chamber and Hopper with material and run the Feeder for about one minute to ensure that the Metering Auger is operating with a complete supply of material. The material level must always be, at least, 100mm above the Feed Auger.

When the Feeder is fully operational, calibrate the output with the settings on the Variable Speed Drive. At each setting, collect several samples, each for a pre-determined time interval. Weigh the samples and record the weight against each selected speed setting. Repeat the procedure until the full range has been calibrated.

CAUTION:

Always use fresh material in Feeder for calibration purposes, in exactly the same condition that the material will be supplied to the hopper when the process is running continuously. Due to the "conditioning" effect on the material through the feeder, incorrect calibration values will result if materials collected as samples are returned to the hopper.

Some materials, particularly those supplied normally to the hopper in the "aerated" condition, become progressively denser each time they pass through the Feeder, resulting in "heavier" samples for the same volume output.

4.2 **Operational Adjustments**

If, during future operations or Plant changes, it becomes necessary to vary the flow rate beyond the nominal limits, then the following is applicable:

- For a small variation to the minimum or maximum speed setting on the Controller, please consult your Controller manual.

Note: The minimum speed of a DC Controller is normally Factory set to approximately 5% of full speed. This ensures the Motor is protected against infrequent pulsing when the speed potentiometer is adjusted to zero and power remains on.

- For large variations to the Flow Rate different sizes and types of Feed Augers and Conditioning Devices are available from Acromet. If your operational requirements change, necessitating a different feed rate, or your material characteristics change necessitating a different conditioning device or style of Auger, please contact Acromet for advice and parts.

5. MAINTENANCE

5.1 General Care

Periodic cleaning of the entire Feeder is recommended, especially when metering adhesive, cohesive or hygroscopic products. When cleaning **DO NOT** hose with water unless your Feeder is specially built for such cleaning methods.

Humidity can have a pronounced effect on some dry materials, so ensure that adequate ventilation or air drying/heating is available to prevent the material from clogging or caking due to moisture absorption.

5.2 Drive Motor (1)

Refer to Manufacturer's Instructions.

5.3 Controller (A.C. or D.C.)

Refer to Manufacturer's instructions.

5.4 COAXOR Gear Drive Unit

The Acromet designed COAXOR Gear Drive Unit (4) is filled with a high grade mineral oil to give sustained life and achieve optimum performance from the gear assembly.

REGULAR INSPECTION OF THE OIL LEVEL IS RECOMMENDED AND SHOULD BE INCLUDED IN YOUR PLANT MAINTENANCE SCHEDULE.
--

The quantity of oil in the unit is dependent upon the orientation of the Motor and COAXOR Gear Drive Unit on your Feeder. The oil level should be visible in the sight glass while your unit is operating.

The recommended replenishment period is 5000 hours or one (1) year service whichever is the earlier. Under arduous or dusty conditions it is recommended the oil is changed more frequently.

The recommended replenishment oil is:

- | | | | |
|----|---------|---|----------------|
| 1. | Castrol | : | SP320 Gear Oil |
| 2. | BP | : | GR-XP-320 ISO |
| 3. | Mobil | : | Mobilgear 632 |
| 4. | Shell | : | Omala 320 |

NOTE: THE USE OF INCORRECT GEAR OIL WILL INVALIDATE ANY WARRANTIES OR SERVICE AGREEMENTS IN FORCE WITH ACROMET.
--

5.5 **Shaft Seal Assembly (Fig. 2)**

The seal has been designed to eliminate any necessity for lubrication and will often last several years dependent upon the abrasive properties of the product being metered. However, if abrasive particles are present, it is advisable to replace the Seal Assembly (Fig. 2) at least once every twelve (12) months. Should the seal start to fail and material manage to penetrate the inner Teflon packing and Outer Seal Cap, this will be evidenced by a leakage deposit through the Adaptor Bracket which is located between the rear wall of the Conditioning Chamber (5) and the COAXOR Gearbox (4).

(Refer to "Dismantling Procedures" for instructions on replacing seals).

6. **DISMANTLING PROCEDURES**

6.1 **Feeder Removal**

- 6.1.1 Run the Feeder until the hopper is empty. If a slide gate is fitted, close off the material feed from the hopper to the Conditioning Chamber (5).
- 6.1.2 Disconnect Motor (1) from power supply and isolate.
THIS MUST BE DONE BY A QUALIFIED ELECTRICIAN
- 6.1.3 If the Feeder is provided with a circular inlet cover and a flexible connector between the cover and the bottom of the hopper, remove the flexible connector and then dismantle the cover by removing the cover bolts.
- 6.1.4 Where the Conditioning Chamber (5) is bolted directly to the bottom of a hopper, remove the bolts between the Conditioning Chamber (5) and the hopper.
- 6.1.5 Remove the bolts securing the Base Plate (12) to the foundation / support and slide the complete feeder out for maintenance access.

6.2 **Tube Plate Removal**

- 6.2.1 The Tube Plate is easily removed by undoing the six nuts and washers fastening the flange of the Tube Plate (6) to the face of the Conditioning Chamber (5).

-
- 6.2.2 Slide the Tube Plate (6) along the length of the Metering Auger (7) until clear. Care should be taken not to bend the Auger (if Auger has not already been removed), or allow spillage of material still retained in the Conditioning Chamber. Carefully remove the Tube Plate Gasket.

NOTE: Model 1501X Feeders furnished with extended length augers require the support of the Metering Auger as the Tube Plate is removed. This is necessary because the Metering Auger cannot support itself from the drive end only.

6.3 Metering Auger Removal

- 6.3.1 The Metering Auger (7) incorporates a left hand internally threaded hub and is fastened to the Auger Drive Shaft (19) at its extension within the Feed Chamber.
- 6.3.2 To remove the Metering Auger, rotate **CLOCKWISE** (when facing the discharge end of the Auger) until Auger is disengaged.

6.4 Conditioning Device Removal

- 6.4.1 Gain access to the Conditioning Device, Auger (42)/Blades (43), by removing the Discharge Tube Plate and Feed Auger as described above.
- 6.4.2 The Conditioning Auger (42) / Blade (43) can be removed by unfastening the three securing bolts attaching the Conditioning Device to the Drive Shaft.
- 6.4.3 Slide the Conditioning Device off the Drive Shaft boss and remove from the Conditioning Chamber.

6.5 COAXOR Gear Drive Unit (Item 4)

- 6.5.1 With the exception of regular inspection of the COAXOR Gear Drive Unit and changing of the Seal Assembly and Oil, it is **NOT** recommended that customers perform any servicing of the COAXOR Gear Drive Unit. Please contact Acromet (Aust) Pty Ltd in case of any problems. Repairs will be carried out by Acromet technicians and to minimise client "down time" a quantity of service/exchange COAXOR Gear Drive Units are available.
- 6.5.2 To remove the COAXOR Gear Drive Unit (4), isolate and disconnect the Drive Motor (1). Remove the four screws securing the Motor and withdraw the Motor. Take care not to lose the Coupling Spider. Inspect the coupling halves and spider for wear.

Remove the Feed Tube (6), Auger (7) and Conditioning Device (17) as described above.

- 6.5.3 Remove the Drive Shaft Cover Guard (9A) from the COAXOR Gear Drive Unit Adaptor Bracket (9). To prevent oil loss, either plug the Breather Hole in the Breather or replace the Breather with a Blank Screw. Four nuts secure the Drive Unit over four studs on the Conditioning chamber, slacken the Nuts and Washers, **support** the rear of the COAXOR Gear Drive Unit and remove the securing Nuts and Washers.

Carefully withdraw the COAXOR Gear Drive Unit from the Conditioning Chamber.

Inspect the Drive End Gasket (10) and replace if torn or damaged.

6.6 **Seal Assembly** : **Auger Drive Shaft** **Conditioning Drive Shaft**

NOTE: Before attempting to change the Seal Assemblies on the COAXOR Gear Drive Unit, please note that special tools are required for disassembly, seal fitting and re-assembly of the Drive Shafts and Seal Kits. Contact Acromet for further details and availability of the tools required.

If you have a particularly aggressive product, the Seal Kits may require replacing more frequently. Proactive maintenance is encouraged and clients should pre-empt problems with the early purchase of the special tool kit and spare inner and outer Seal Kits.

REMOVAL AND ASSEMBLY OF THE SEAL KITS REQUIRES THE FOLLOWING SPECIAL TOOLS WHICH ARE AVAILABLE FROM ACROMET (AUST) PTY LTD.

<u>Special Tools:</u>	(121)	Drive Shaft Locking Tool
	(122)	Dummy Conditioning Shaft
	(123)	S/S Outer Packing Insert
	(124)	S/S Inner Packing Insert
	(120)	AK1501X-PACK Items above as a complete kit.

6.6.1 **Seal Assembly Removal : Outer Packing Kit (112)**

- (a) Remove the COAXOR Gear Drive Unit as described above.
- (b) With a suitable screw, attach the "Shaft Locking Tool" (121) to the Conditioning Drive Shaft (47).
- (c) Using a soft hammer, give the Locking Tool Arm a short sharp tap in a **clockwise** direction. The Conditioning Drive Shaft has a LEFT HAND securing thread.
- (d) Unscrew the Conditioning Drive Shaft (**clockwise**) complete with the Conditioning Shaft packing Housing (8).
- (e) Carefully remove the Conditioning Drive Shaft from the Packing Housing, exposing the Outer Seal Assembly (112). Inspect the Conditioning Drive Shaft for wear or run-out. If suspect, replace. Please contact Acromet.

- (f) Support the Packing Housing Flange in a **soft** jaw vice to provide easy access for removal/refit of the Seal Kit. Remove the Outer Packing Nut (104), use a strap wrench or similar tool, as required, to slacken the Packing Nut.
- (g) Carefully remove the Braided Packing (108) using care to avoid damage to the Packing Housing Threads.
- (h) Remove the Follower (107) and Spring (110).
- (i) Clean the Packing Housing in preparation for re-assembly.
- (j) Inspect the Packing Housing for damage.

6.6.2 **Seal Assembly Removal : Inner Seal Kit (111)**

- (a) Ensure the above directions have been carefully executed before fitting a new Inner Seal Kit.
- (b) Inspect the Auger Drive Shaft (19) for damage. If suspect, the complete COAXOR Gear Drive Unit must be returned to Acromet for service/repair.
- (c) Secure the Conditioner Drive Shaft (47) in a **soft** jaw vice. Use **soft** jaws to prevent damage to the flange face.
- (d) Remove the Inner Packing Nut (105), Braided Packing, Follower and Springs.
- (e) Inspect the inner Threads of the Conditioner Drive Shaft.

6.6.3 **Seal Assembly Installation : Outer Packing Kit (112)**

- (a) Support the packing Housing Flange in a **soft** jaw vice. Soft jaws must be used to prevent unnecessary damage to the flange.
- (b) Insert the Dummy Conditioner Shaft (122) through the centre.
- (c) Fit the new Spring (110).
- (d) Fit the new Follower (107).
- (e) Smear the inner face of the Braided Packing (108) with suitable grease. "Molykote Bearing Grease BR2 Plus" is recommended.
- (f) Fit two turns of Braided Packing.
- (g) Fit the Outer Metal Insert Nut (123) to tighten down the Braided Packing. Use a Pin Punch, suitable Bar or "C" Spanner to tighten and undo the Outer Metal Insert Nut. Remove the Insert Nut.
- (h) Fit a third turn of Braided Packing and using the Metal Insert Nut tighten down the Packing then remove the Insert Nut.
- (i) Fit the fourth turn of Braided Packing and tighten down with the Insert Nut. Remove the Insert Nut.
- (j) Clean the exposed threads of any debris before fitting the Teflon Packing Nut (104).

- (k) Fit the Teflon Packing Nut (104) and tighten down. Use a strap wrench.

(Stilsons, Chainwrench, etc are **NOT** recommended.)

- (l) Remove the Dummy Conditioning Shaft in preparation to fit the Conditioning Shaft.
- (m) Remove the Inner Packing Kit from the Conditioning Shaft as described below and carefully fit the Conditioning Shaft through the Packing Housing Seals. Screwing the Conditioning Shaft through the Outer Seal Assembly will prevent damage to the newly assembled Outer Seal Kit.
- (n) The sub-assembly can now be refitted to the COAXOR Gear Drive Unit.
- (o) Smear some Molykote BR2 grease on the Conditioning Drive Shaft, Driving Thread[†]. Carefully offer up and screw home the Conditioner Drive Shaft (**anti-clockwise** direction).

[†] **Note:** The Driving Thread is a precision machined left hand thread. Use caution to prevent damage to either male or female driving threads.

- (p) Use the Shaft Locking Tool (121) to secure the Conditioner Drive Shaft. (Short sharp rap with a soft hammer in **anti-clockwise** direction). Remove the Shaft Locking Tool.

6.6.4 **Seal Assembly Installation : Inner Seal Kit (111)**

- (a) With the Conditioner Drive Shaft complete with Packing Housing refitted to the COAXOR Gear Drive Unit proceed to fit the new Inner Spring (103).
- (b) Fit the new Inner Follower (109).
- (c) Smear the inner surfaces of the Braided Packing (106) and fit two turns. Tighten down with the Inner Metal Insert Nut (124). Remove the Insert Nut.
- (d) Fit the third turn of Braided Packing and tighten down.
- (e) Fit the fourth turn of Braided Packing and again tighten down with the Insert Nut.
- (f) Fit the new Inner Teflon Packing Nut and tighten down.

6.7 **Re-Assembly of the COAXOR Gear Drive Unit**

Re-assembly of the COAXOR Gear Drive Unit to the Conditioning Chamber is a reversal of the removal procedure.

After electrically reconnecting the Drive Motor, carry out a short test to confirm the Auger is rotating in the correct direction. **Clockwise** as viewed from the front of the Feeder.

ITEM	PART NO	DESCRIPTION	QTY REQD	NOTES
1	001- AS SPEC	DRIVE MOTOR	1	
2	002- AS SPEC	PLATE MOTOR ADAPTOR	1	
3	003-29/01/SP	COUPLING, MOTOR	1	
4	004-35933	COAXOR GEAR REDUCTION BOX	1	T
5	005-35929	CONDITIONING CHAMBER, +30 LTR HOPPER	1	#
5X	005-35931	CONDITIONING CHAMBER ONLY	1	#
6	006- AS SPEC	DISCHARGE TUBE PLATE	1	
7	007- AS SPEC	METERING AUGER	1	
8	008-35771	SEAL HOUSING PLATE	1	
9	009-29/01/40	ADAPTOR BRACKET (available only with item 4)	1	T
9A	009-03/15/13	DRIVE SHAFT COVER GUARD	1	
10	010- AS SPEC	GASKET, ADAPTOR BRACKET	1	
11	011- AS SPEC	GASKET, DISCHARGE TUBE PLATE	1	
12	012-35823	BASE PLATE	1	
13	013- AS SPEC	GASKET, HOPPER – CIRCULAR INLET	1	#
14	014- AS SPEC	HOPPER	1	#
15	015- AS SPEC	CIRCULAR INLET	1	#
19	019-35907	AUGER DRIVE SHAFT	1	

ITEM	PART NO	DESCRIPTION	QTY REQD	NOTES
27	027-08/11/31	WASHER, FLAT, Ø 8mm	14	
28	028-08/02/91	SCREW, HEX, M10 (MOTOR)	4	
29	029-09/01/25	WASHER, FLAT, Ø 10mm	4	
32	032-08/11/26	NUT, M8	10	
35	035-08/02/110	SCREW, HEX, M8x16, (BASE / CHAMBER)	4	
35	035-08/02/110	SCREW, HEX, M8x16, (CIRCULAR INLET)	10	#
37	037-08/02/111	SCREW, HEX, M8x20, (C-C / HOPPER)	10	#
38	038-09/01/31	WASHER, FLAT, Ø 8mm	10	#
39	039-08/01/79	SCREW, CAP, M6x32 (COND. AUGER)	3	#
40	040-08/01/78	SCREW, CAP, M6x25 (COND. BLADES)	3	#
42	042-03626	CONDITIONING AUGER	1	#
43	043-35084	CONDITIONING BLADES	1	#
44	044-08/11/27	NUT, M10 (MOTOR)	4	
47	35907	AUGER DRIVE SHAFT	1	T
95	095-11/01/10	CIRCLIP, EXTERNAL, DRIVE SHAFTS	2	

Notes:

T Available in kit form only

When fitted

WHEN ORDERING SPARE PARTS PLEASE STATE:

- The Feeder Serial Number
- The Feeder Model Number
- The Spare Part Item Number and full description

MODEL 1501X DRY MATERIAL FEEDER

GENERAL ASSEMBLY

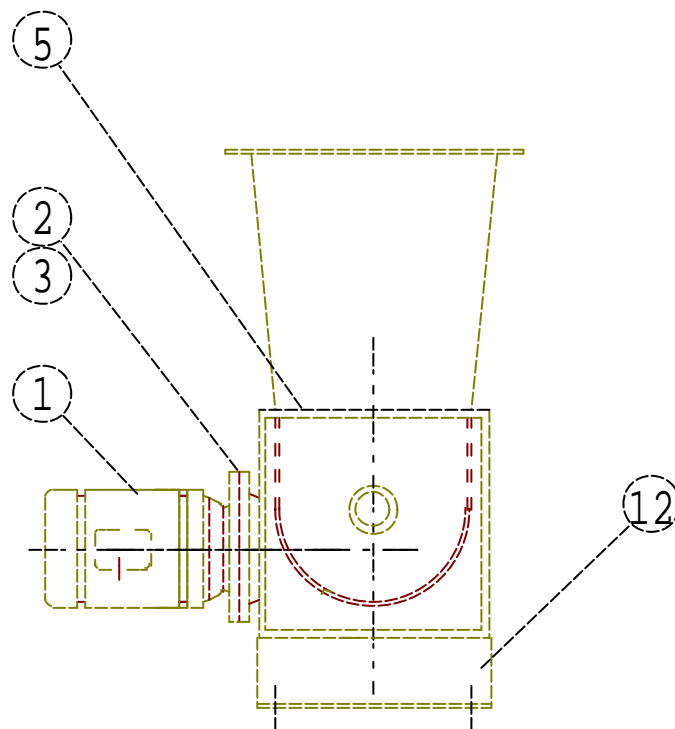
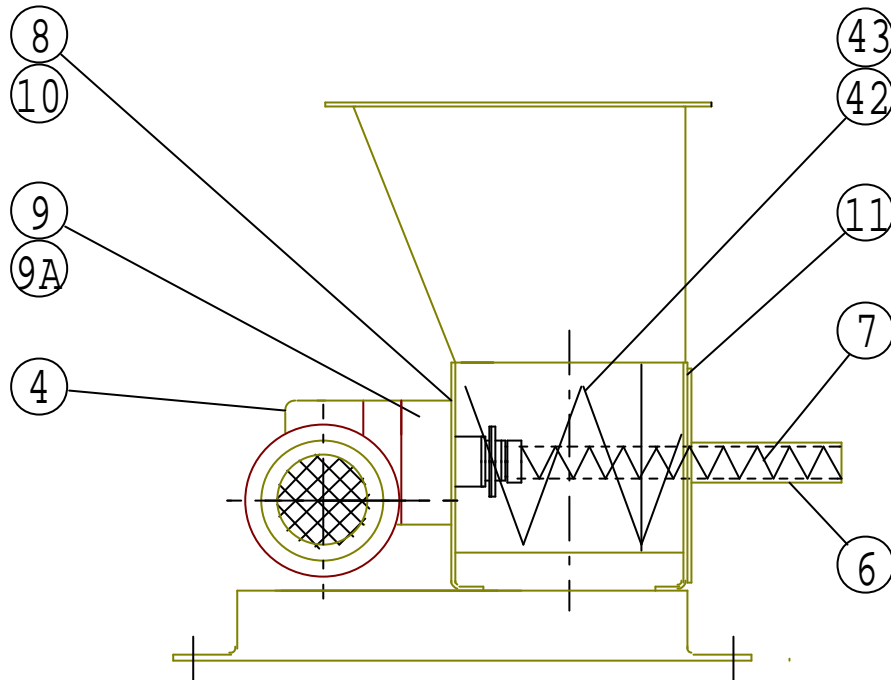


FIG. 1

ITEM	PART NO	DESCRIPTION	QTY REQD	NOTES
103	103-35415	SPRING (AUGER)	1	T
105	105-03607	SEAL CAP (AUGER)	1	T
106	106-07/04/02	PACKING BRAIDED TEFLON (AUGER)	4	T
109	109-03548	FOLLOWER (AUGER)	1	T
111	111-35437	SEAL KIT (AUGER)	1	T
104	104-03620	SEAL CAP (CONDITIONER)	1	T
107	107-03621	FOLLOWER (CONDITIONER)	1	T
108	108-07/04/01	PACKING, BRAIDED TEFLON (CONDITIONER)	4	T
110	110-35414	SPRING (CONDITIONER)	1	T
112	112-35438	SEAL KIT, (CONDITIONER)	1	T
120	AK-1501XSEAL	ASSEMBLY KT, SEAL INSERTION	1	T
121	35949	DRIVE SHAFT LOCKING TOOL	1	T
122	35950	DUMMY CONDITIONING SHAFT	1	T
123	35951	OUTER PACKING INSERT NUT	1	T
124	35952	INNER PACKING INSERT NUT	1	T

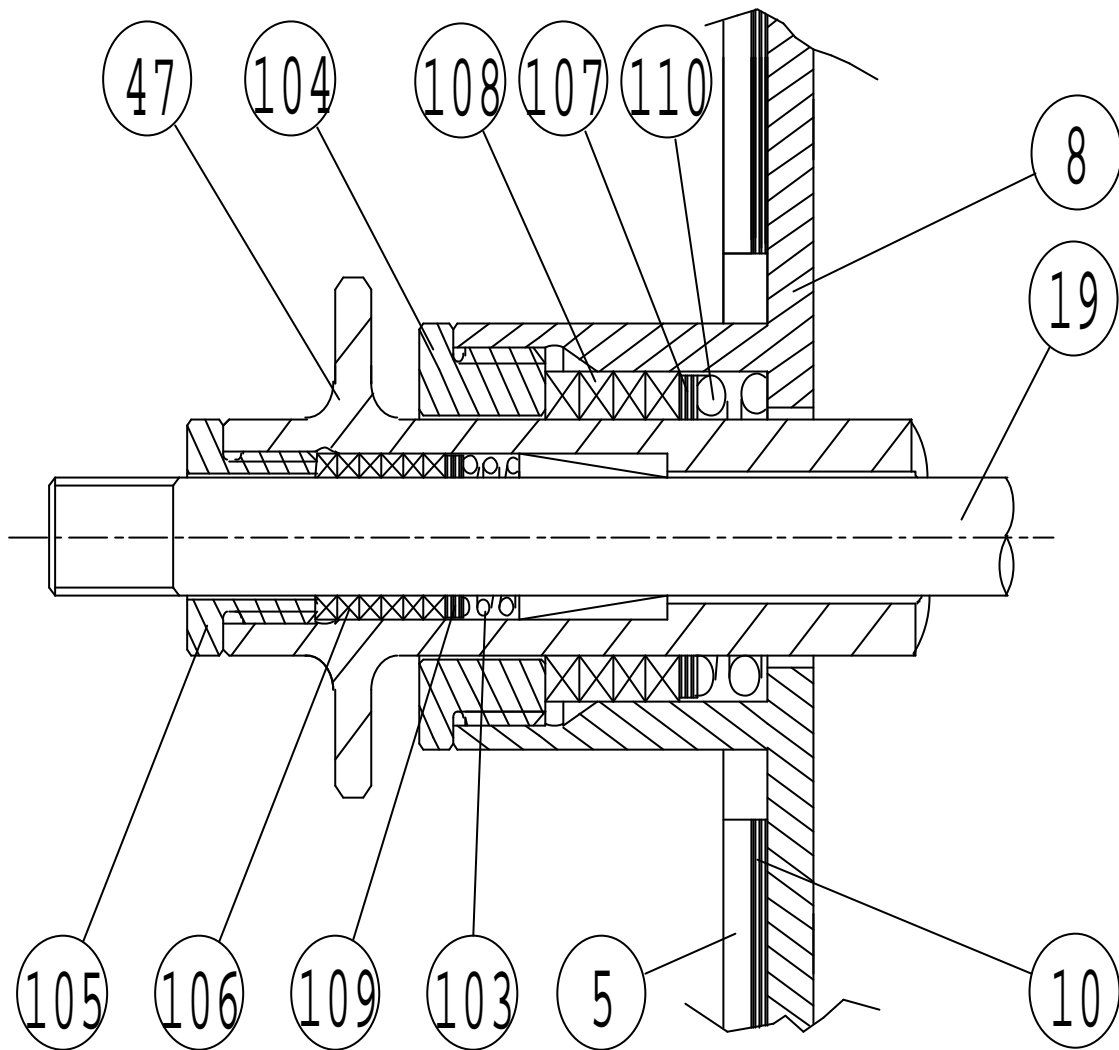
Notes:

T Available in kit form only

When fitted

WHEN ORDERING SPARE PARTS PLEASE STATE:

- The Feeder Serial Number
- The Feeder Model Number
- The Spare Part Item Number and full description



SEAL ASSEMBLY

NOTE: SHAFT SEALING COMPONENTS
ARE AVAILABLE IN KIT FORM ONLY

SEAL KIT COMPLETE SK1500
consisting of
INNER SEAL KIT = 111-35437
OUTER SEAL KIT = 112-35438

MODEL 1501X DRY MATERIAL FEEDER

FIG. 2