



OPERATING, INSTALLATION & MAINTENANCE MANUAL

FOR

710 ELECTRIC SAMPLE PROBE

SC



This Jiskoot Product is designed to provide outstanding service if correctly installed, used and maintained recognising the effects of the process conditions (temperature, pressure, wax/pour point, sediment, etc.).

Truly representative sampling of crude oils etc., cannot be achieved by one single product in isolation. A well designed system and operating procedures as laid down in the Sampling Standards ISO 3171, API 8.2 and IP Chapter VI section 2 are mandatory.

Please consult Jiskoot for further information and assistance.

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1 Introduction



The 710 Electric Sample Probe provides a means of extracting a sample from liquids flowing in a pipeline. Designed for applications where instrument air is unavailable, the 710 Probe is installed directly into the main pipeline.

The 710 Sampler is designed to extract nominal 1cc samples from products ranging from Natural Gas Liquid at 0°C to refined and crude oil at up to 100°C, operating in a pressure range from 3 to 50 Barg, on viscosities 0.5 to 5000cSt. The Sampler can operate in an ambient temperature range of -20°C to 40°C and has an Ingress Protection rating of IP55 (BS EN 60529: 1992).

The standard 710 Sampler is designed for installation through a 2" 150# or 2" 300# raised face flanged tapping in the pipeline and can withstand static pressure testing to full flange rating of 76 Barg. Other flange sizes may be available to special order.

The Sampler is supplied with either a single phase 110 or 240 Volt, 50 or 60 Hz motor, or with a 3 phase motor as specified at order placement. A range of solenoids are available to suit the particular installation, and both Motors and Solenoids may be supplied for use in a hazardous area, certified to either CENELEC Zone 1, Gas Group IIB, T4 or UL/FM Class 1, Division 1, Gas Groups 2, 3 & 4.

Note: *When requesting assistance or spare parts, please provide the Sampler Model and Serial Numbers to ensure that the correct options are noted.*

2 Operating Instructions

The Sampler must be installed in accordance with the Installation Details, and be connected to a suitable sample receptacle.

A suitable Sample Receiver must be connected to the Sample outlet.

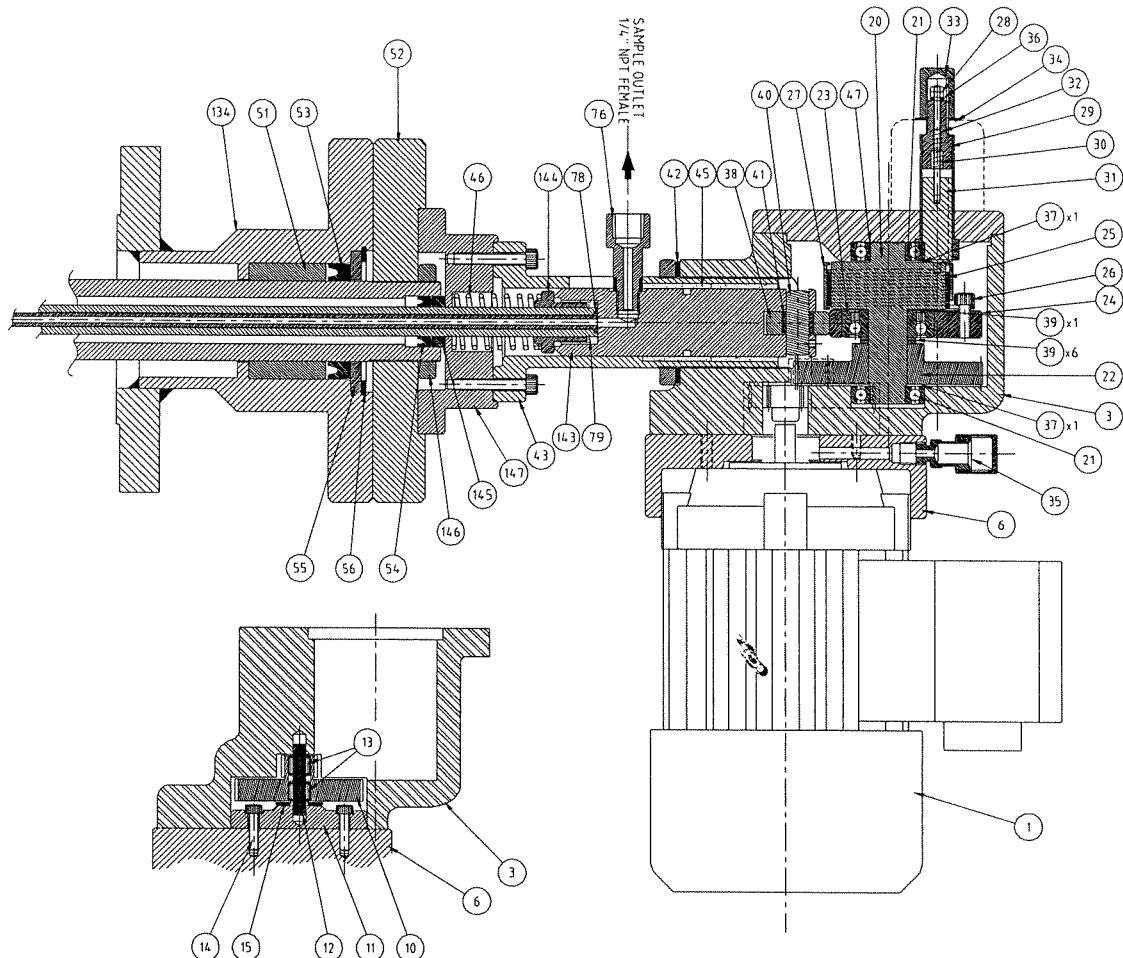
To operate the Sampler, it is necessary to apply continuous power to the motor and to energise the Sampler Solenoid to take a sample at the required intervals. Any pipeline conditioning facility must be active to ensure a representative product is available to the Sampler.

Control of the Sampler, including changeover of Sample Receivers will be determined by the type of Sampler Control System being used.

3 Glossary of Special Terms

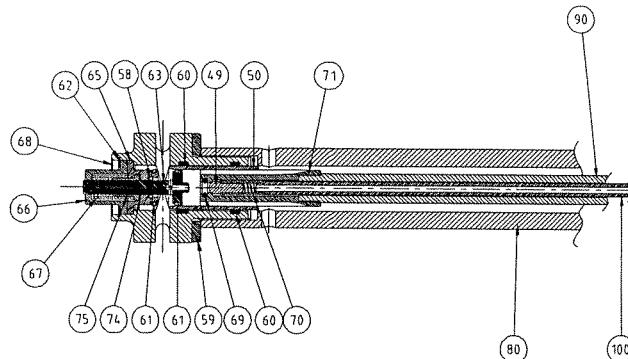
Grab: The action of taking an individual sample (normally 1 or 2 ml) from the pipeline.

4 General Assembly & Bill Of Material



Item No	Description	Part Number	Item No	Description	Part Number
1	Motor		2	Solenoid Coil	
3	Gearbox Housing	36-3070-00	4	Gearbox Cover	36-3071-00
5	M5 *16 Cap Head Screw		6	Motor Adapter	36-3072-00
7	Helical Gear	39-0270-00	8	M5 *25 Cap Head Screw	
9			10	Gear Cluster	39-0186-00
11	Blanking Plug	36-3074-00	12	Dowel	36-3075-00
13	Needle Roller	39-0150-00	14	M4 * 12 Cap Head Screw	
15	Thrust Washer	39-0021-00	16		
17			18		
19			20	Gearbox Shaft	36-3073-00
21	Ball Bearing	39-0053-00	22	Spur Gear	39-0231-00
23	Free Wheel Ball Race	39-0162-00	24	Cam	36-3077-00
25	Clutch Spring	40-0200-00	26	M5 * 10 Cap Head Screw	
27	Unwind Restrictor	36-3078-00	28	Half Nut	99-0013-00
29	Armature Sleeve	36-3079-00	30	Stop Screw	36-3080-00
31	Armature	36-3081-00	32	Spring	40-0201-00
33	Solenoid Nut	36-3065-00	34	Crinkle Washer	
35	Lubricator	40-0206-00	36	'O' Ring	37-0702-00
37			38		
39			40	Dowel	36-3076-00

Item No	Description	Part Number	Item No	Description	Part Number
41	Ball Bearing	39-0163-00	42	Delrin Washer	36-3138-00
43	Mounting Tube	36-3089-00	44	Lock Nut	36-1134-00
45	Wear Bush	39-0020-00	46	Spring	40-0202-00
47	Bearing Pre-load Spring	40-0207-00	48	M5 * 25 Cap Head Screw	



Item No	Description	Part Number	Item No	Description	Part Number
49	Check Valve Tip	36-3129-00	50	2cc Sleeve	36-0380-00
51	Guide Bush	36-3102-00	52	Support Tube Flange	36-3092-00
53	Seal	37-0570-00	54	Seal	37-0730-00
55	Seal Backing Ring	36-3103-00	56	Circlip	37-0571-00
57			58	Balseal	37-0573-00
59	Stop Ring	36-3106-00	60	Slydring	37-0518-00
61	Balseal	37-0540-00	62	Circlip	37-0574-00
63	Sample Plunger	36-3107-00	64	Cap Head Bolt M10 * 40	
65	Sample Pillar	36-3108-00	66	Spring Retainer	36-3109-00
67	Spring	40-0204-00	68	Sample Head	36-3105-00
69	'O' Ring	37-0572-00	70	Spring	40-0089-00
71	Capture Tube Mount	36-3104-00	72	Label	33-0270-00
73			74	Circlip	37-0602-00
75	Lower Spring Guide	36-3139-00	76	Outlet Adaptor	36-3086-00
77			78	'O' Ring	37-0581-00
79	Circlip	37-0582-00	80	Support Tube	
90	Capture Tube		100	Valve Stem	
134	Seal Housing		143	Cam Follower	36-3083-00
144	Capture Tube Retaining Nut	36-3088-00	145	Seal Retainer	36-3085-00
146	Lock Nut	36-3091-00	147	Adaptor Block	36-3090-00

5 Full Functional Description

The 710 Electric Sample Probe operates on grab principles similar to previous Jiskoot Samplers, but uses an electric motor to provide the motive power.

The Sampler Motor (1) is designed for continuous operation, the shaft speed being reduced through a gearbox to a free-wheel gear and clutch arrangement. The Clutch (25) is normally held disengaged by the Solenoid Armature (31), allowing the motor to freewheel. When the Solenoid Coil is momentarily energised, it disengages the spring clutch, turning the Cam (24).

The Capture Tube (90) is attached to the Cam Follower (143) and as the Cam revolves, the Capture Tube moves downwards, trapping a sample of product in the void between the Sample Plunger (63) and the bottom of the Sample Pillar (65). Continuing downward motion forces the trapped sample through the centre of the Plunger past the Check Valve Tip (49) up the Valve Stem (100). The sample is then expelled through the Outlet Adapter (76) via the external Check Valve to the sample receptacle.

As the Cam continues to revolve, the Capture Tube moves away from the Sample Plunger and back up to the dwell position, ready for the next grab to be initiated and allowing fresh product to pass in the area between Sample Plunger and Sample Pillar.

6 Utilities Reference

Motor Voltage Available:	Single phase	110-120 Volts 50/60 Hz
	Single phase	220-240 Volts 50/60 Hz
	Three phase	380-440 Volts 50/60 Hz
	Power Consumption	60 Watts (nominal)
Solenoid Voltages Available:	Single phase	110-240 Volts 50/60 Hz
	Single phase	24 Volts DC
	Power Consumption	10 Watts
Sample pulse duration (Solenoid energisation time)		50-250 milliseconds
Maximum Grab Rate **		50 grabs/minute at 50Hz operation

**Maximum grab rate is dependant on supply frequency and process conditions (i.e. line pressure and fluid viscosity)

7 Installation Details

7.1 Installation

The standard 710 Electric Probe Sampler is designed to be bolted to a 2" ANSI 150# or ANSI 300#RF flanged tapping on the side of the pipeline and can withstand static pressure testing to full flange rating.

Note: *Sample probes may be installed vertically but in accordance with the sampling standards this is a non-preferred method*

The 710 Sampler is supplied with a Seal Housing which, when used in conjunction with a Jiskoot 710 Hydraulic Extractor, will permit the Sampler to be safely installed into (or removed from) a flooded or pressurised pipeline via a full bore ball valve fitted to the flanged tapping. Full details of the use of the Sampler with the Extractor are contained in the 710 Hydraulic Extractor Handbook.

The Sampler will be supplied with the Motor facing across the pipeline, but may be rotated through 90° by removing the 4 off M5 Cap Head Screws (48) and turning the Mounting Tube/Gearbox Assembly. Under no circumstances must the Lock Nut (44) be loosened and the Mounting Tube rotated in the Gearbox Housing as this will disturb a critical internal alignment.

The Motor and Solenoid are selected to suit the specific application and will require connecting to suitable supplies via glands and cables appropriate to the area classification. CENELEC certified motors are supplied with an M20 cable entry, FM certified motors and solenoids have a 1/2" NPT entry. CENELEC certified solenoid coils are supplied with an encapsulated lead to be connected to the Sampler Controller via a suitably certified junction box. Where electrical connections are to be made through conduit, flexible conduits should be used.

External earth tags are provided on the motor and on the CENELEC certified solenoid to permit adequate bonding of the equipment to the site earth/ground.

The motor is designed for continuous operation and should be connected to the power feed via a suitably fused start/stop switch or isolator. An Emergency Stop Button should be fitted close to the Sampler to provide a means of shutting the sampler off in an emergency.

The Sampler must not be operated with either the Shroud covering the Mounting Tube or the Gearbox Cover removed (other than to check the correct rotation of the motor as detailed below).

The Sample Outlet Adapter (76) should be connected to an external Check Valve. This must be set to either 7 Bar above the maximum line pressure for low pressure receiver systems or to 1 Barg where line balanced high pressure sample receivers are being used (i.e. where the sample is being collected at or close to line pressure).

The outlet of the Check Valve should be connected to the Sample Receiver system via small-bore (1/4" or 6mm) stainless steel tubing. Ensure that lengths of tubing are kept to a minimum to minimise "dead" i.e. trapped volume (long lengths of tubing also create extra back pressure and premature seal wear), and that the sample travels downhill from the Sampler Outlet to the receiver to avoid water traps. The sample outlet piping may require heat tracing to prevent blockage.

The Sampler Control System must be capable of supplying a pulse of between 50 and 250mS duration to ensure that the Armature has time to engage the clutch and then reset before the cam has completed one revolution.

7.2 Motor Rotation

Note: Before commissioning three phase versions of the sampler is it essential to check that the motor will revolve in the correct direction. The clutch assembly will be damaged if the motor rotates backwards.

710 Samplers fitted with 3 Phase motors will be supplied with a temporary plastic spacer fitted between the 'O' Ring (36) and the Armature Sleeve (29) to prevent the clutch being accidentally engaged.

To check motor direction, check that the plastic spacer is fitted as described above by removing the Solenoid Nut (33). If not, disengage the clutch by removing the Gearbox Cover (4).

Momentarily apply power to the motor.

The **motor** must rotate **anticlockwise** when viewed from the fan end, or the **Gearbox Shaft** (20) must rotate **clockwise** when viewed through the gearbox opening.

To reverse direction, change over two phases of the motor supply. Do not continue to operate the Sampler with the Gearbox Cover removed. Remove the plastic spacer (if fitted) to engage the clutch.

8 Maintenance and Troubleshooting

8.1 Health and Safety Precautions

The 710 Sampler may be used in applications involving carcinogenic or other hazardous products. Care must be taken to avoid contamination by any product trapped within the internal components that may be released as the Sampler is stripped down.

8.2 Weekly Maintenance

The Sampler may require lubricating on a weekly basis. This is simply carried out by screwing in the Lubricator (35) fitted to the top of the Motor Adapter (6) until the gearbox is heard to run quietly. When the Lubricator has been fully screwed in, remove the cap and repack the Lubricator with a high melting point, general-purpose grease suitable for temperature range of -20°C to +200°C such as *Electrolube*.

Note: *Avoid greasing the probe excessively, excess grease may solidify or prevent proper operation of the probe. Refer to section 8.3.2 for details of gearbox maintenance.*

8.3 Annual Maintenance

The 710 Electric Probe Sampler is designed to operate continuously for a period of about 1,000,000 grabs or 12 months before a major overhaul, however this service interval will be affected by the type of product being sampled, particularly the amount of particulate matter such as sand, and therefore can not be guaranteed. When used in crude oils with high levels of sediment or from mixed carrier shipments, the maintenance interval may be shortened. The service intervals will therefore need to be determined from the experience gained on the particular application.

The Sampler should be removed from the pipeline and taken to a clean area for servicing.

NOTE: *It is essential that soft vice jaws are used whenever components are required to be held, and that all components, particularly those with sealing faces are thoroughly cleaned of dirt and other contamination by degreasing and drying prior to re-assembly. If any of the sliding surfaces are damaged, leakage will occur from the seals.*

All joints, 'O' Rings and moving parts must be lubricated on assembly using a general purpose grease such as Castrol "Spheerol B2" grease or an equivalent lithium based water-resistant grease.

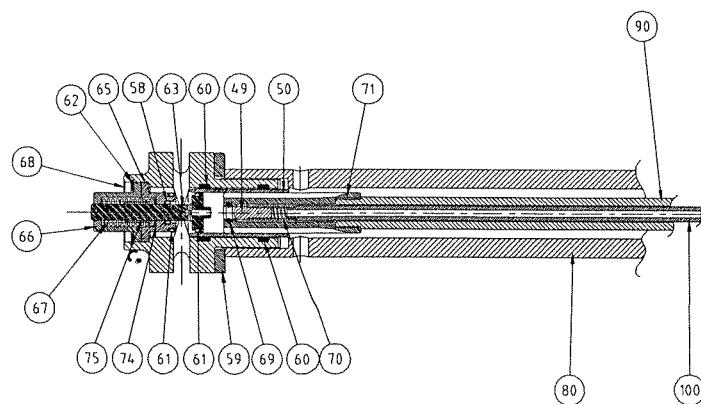
The motor and gearbox components must be lubricated with a high melting point grease such as "Electrolube".

Jiskoot recommend that to prevent seizure, all screwed components are lubricated with copper grease on assembly.

A Special Tool Kit, Part No 45-0173-00, is available to assist in fitting some components and seals. Failure to use the correct tools may damage seals and other components, and will have a direct effect on the future performance of the Sampler.

8.3.1 Sampler Seal Replacement

Sample Head Assembly



Before removing the Sample Head Assembly, take particular note of the position of the Head in relation to the Support Tube and the gap between the Stop Ring and Sample Head.

The Sample Head Assembly is unscrewed from the Support Tube using the 'C' Spanner provided in the Special Tool Kit.

To strip down and overhaul the component parts, carefully remove the Circlip (62), being prepared to catch any of the spring loaded components that are released.

Remove the Sample Pillar/Plunger Assembly (Items 63, 65, 66, 67, 74 & 75).

Remove the Circlip (74) from the Sample Plunger (63) and remove the Sample Plunger from the Sample Pillar (65).

Carefully remove the three Balseals using a sharp knife, taking care not to damage the sealing surfaces.

Examine all components for signs of wear, particularly on the sliding surfaces and thoroughly clean to remove any debris. Discard all seals.

Fit the new Balseal (Item 61) after immersing it in warm water to make it more pliable. Grease the seal and carefully ease it over the retaining grooves on the Sample Plunger (Item 63) with the seal spring facing the Sample Plunger shaft. Press the seal firmly into the groove using fingers. Repeat this operation for the second Balseal and the Sample Pillar (Item 65) with the spring to the top of the Pillar.

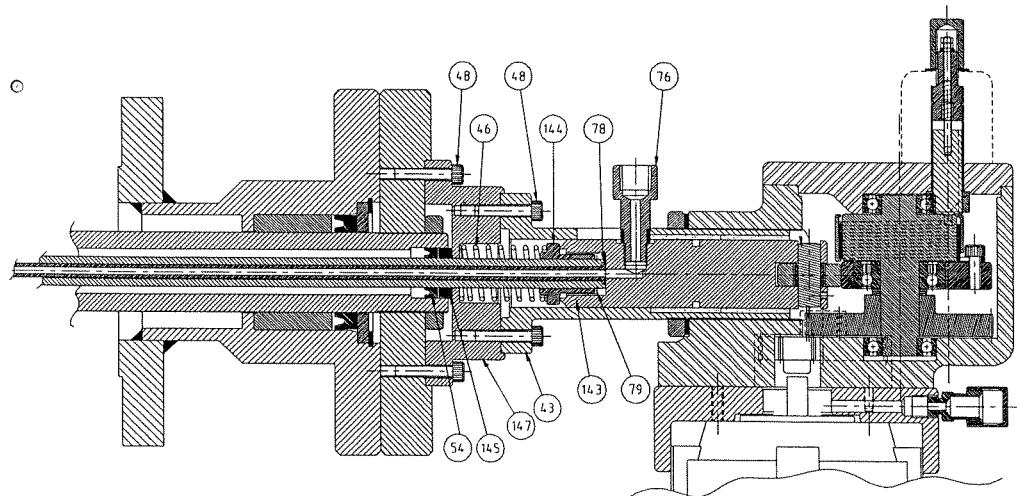
Warm Balseal (Item 58) as above and, using the Sample Pillar Balseal Insertion Tool, push past the retaining lip on the Sample Pillar into the groove with the spring facing up towards the top of the Pillar. Use the inner part of the tool to form the inside edge of the seal to the correct size.

Reassemble the Sample Head Assembly securing the internal components with the Circlip (62).

When refitting the Sample Head (68) to the Support Tube (80) it is essential to ensure that the clearance between the Sample Plunger (63) and the bottom of the Capture Tube Mount (71) is maintained between 0.010" and 0.020" (0.25mm and 0.5mm).

To establish the correct location of the Sample Head, using an 3mm Allen Key in the Spring Retaining Screw (26), rotate the Cam anticlockwise to position the Capture Tube at the bottom of its travel. Screw the Sample Head onto the Support Tube until the Sample Plunger has been fully depressed by the Capture Tube Mount. Unscrew the Sample Head by 90° and continue until the ports in the head align with the vent hole in the Support Tube and the "Flow" arrow on the Seal Housing. Tighten the Stop Ring (59). Check that clearance exists by rotating the Cam through a complete revolution and ensuring that there is no evidence of the Sample Plunger binding against the Capture Tube Mount.

Capture Tube Seal



Remove the 4 off M5 Cap Head Screws (48) retaining the Mounting Tube (43) to the Adapter Block (147), noting the orientation of the Motor/Gearbox Assembly to the Support Tube Flange.

Unscrew the Outlet Adapter (76), and lift the Motor and Gearbox assembly off the Adapter Block (147), leaving the Capture Tube and Cam Follower Assembly (90 & 143) in the Support Tube.

Unscrew the Capture Tube Retaining Nut (144) from the Cam Follower (43).

Carefully remove the Circlip (79) to release the Capture Tube Retaining Nut from the Capture Tube and remove Spring (46).

Unbolt the Adapter Block (147) from the Support Tube Flange (52) by removing the 4 off M5 Cap Head Screws (48).

Withdraw the Capture Tube Assembly through the Support Tube (80), allowing the end of the Capture Tube to pull the Seal (54) and Seal Retainer (145) from the end of the Support Tube.

Remove the 'O' Ring (57) from the inside of the Cam Follower.

Remove the Valve Stem (100), Spring (70), and Check Valve Tip (49) from the inside of the Capture Tube.

Carefully prise out the Check Valve 'O' Ring (69) from the end of the Capture Tube using the Check Valve 'O' Ring Removal Tool.

Clean and examine all components for wear, and discard all seals. Any visibly worn components should be replaced.

Reassemble all components, greasing all sealing and sliding surfaces and ensuring that the Seal (54) is fitted the correct way round.

The 'O' Ring (69) is replaced after the Capture Tube has been refitted to the Cam Follower. Place Check Valve 'O' Ring Removal Tool inside the Capture Tube Sleeve, lightly grease the 'O' Ring and use Check Valve 'O' Ring Insertion Tool to push the 'O' Ring through Capture Tube Sleeve Tool into the Capture Tube Mount.

Seal Housing Seal

To replace the Seal (53) in the Seal Housing (134), it is necessary to remove the Sample Head Assembly and to withdraw the complete Sample Tube/Motor/Gearbox Assembly from the Seal Housing.

Remove the Sample Head Assembly as described earlier. If the Capture Tube/Motor/Gearbox Assembly has not already been removed as described above, and it is not intended to replace the Capture Tube Seal, release the complete Sample Tube/Motor/Gearbox Assembly from the Seal Housing by removing the 4 M10 Cap Head Screws (64), and withdraw the complete assembly from the Seal Housing.

If the Capture Tube/Motor/Gearbox Assembly has previously been removed, unbolt the Support Tube Flange from the Seal Housing by removing the 4 M10 Cap Head Screws (64), and withdraw the Support Tube from the Seal Housing.

Remove the Circlip (56) from the Seal Housing using a pair of circlip pliers, and remove the Seal Retainer and Seal.

Clean all components and reassemble, fitting the new Seal.

8.3.2 Motor, Gearbox, Solenoid and Clutch Assembly

The Gearbox, Solenoid and Clutch Assembly should normally only require to be stripped down to remove the old grease from the clutch, and then reassembled.

Motor/Gearbox Replacement

Due to the need for special tools and the fine tolerancing of the internal gears, field servicing or replacement of the Motor and Gearbox is not recommended. In the event of failure of these components, the entire Sampler should be returned to Jiskoot for repair.

If the Motor or Gearbox are required to be replaced on site, detailed assembly instructions will be supplied with the spare parts.

Clutch Overhaul

The only regular maintenance required is to remove as much of the old grease from the Housing as possible, and to remove, inspect and clean the Clutch Spring (25).

Remove the 4 off M5 x 16 Cap Head Screws (5). The Gearbox Cover (4) is a push fit onto the Outer Bearing 21 and may be removed by rotating the Cover against the Gearbox Housing and pulling off with a rocking motion. DO NOT LEVER APART.

To remove the Clutch Spring from the Cam (24), unscrew the M5 x 10 Cap Head Screw (26) securing the spring assembly to the Cam, and withdraw the assembly from the housing.

Remove the Unwind Restrictor (27) from the Clutch Spring, and examine the spring for damage, particularly on the end that engages with the Armature (31). Replace if necessary.

To refit, lightly grease the Clutch Spring, and fit Unwind Restrictor over the Spring, with the wide recess over the loop end of the Spring and the straight end located in the small notch.

Push Spring over Gearbox Shaft, with looped end downwards. Refit the M5 x 12 Cap Head Screw (26) into Cam, ensuring looped end of Spring is secured under the head. Tighten the Screw.

Lightly grease the Gearbox Shaft front Bearing and Gearbox Housing face and fit Gearbox Cover to Gearbox Housing with 4 off M5 x 16 Cap Head Screws.

Solenoid Overhaul

To remove the Armature Assembly, remove the Gearbox Cover as described above, unscrew the two M3 half nuts from the end of the brass screw, and pull off the 'O' Ring and Spring (32). Withdraw the Armature (31) from the Armature Sleeve (29) and clean off old grease.

Ensure that the clutch end of the Armature is not damaged or worn and replace if necessary.

Check that the Armature slides in and out of the Sleeve without signs of binding. Lightly grease the Armature and refit to the Armature Sleeve, replace the Spring, 'O' Ring and M3 nuts and adjust to obtain a total travel of 4-5mm. Tighten the locknuts to hold location.

Replace the Gearbox Cover as described above.

9 Frequently Asked Questions

9.1 Sampler Fails to take any sample

Check product is available to sampler

Check all valves are open

Check motor is running - feel or listen for operation.

Is solenoid being energised? - Remove Coil and check Armature moves freely by pulling brass Stop Screw (30) out from Armature Sleeve and releasing. Sampler should operate when Armature is manually operated. Check Solenoid Fuse

Check solenoid operation with a voltmeter or by placing a steel screwdriver or similar object inside the coil. The screwdriver will move when the coil is energised.

Check Sampler Controller is demanding a grab and that any interposing relays are operating satisfactorily.

Check that Sample Receiver is not either full, blocked by wax or isolated (Carefully loosen "T" connections in sample discharge tubing to test).

Turn off the electrical supply to the Motor and remove the Gearbox Cover. Check the Clutch Spring has not broken.

If the above are satisfactory, than the Sampler will require a change of internal seals.

9.2 Sampler fails to take adequate sample

Check Sample Receiver is not full or the sample outlet piping blocked through waxing.

Check the external Check Valve fitted to Sampler Outlet Adapter is set to 7 Bar above line pressure for normal low pressure receiver systems and to 1 Bar where high pressure sample receivers are being used. If pressure is too high, excessive wear will be caused to the Sampler internal seals.

Check that the Armature is not sticking in the Armature sleeve by manually pulling the brass Stop Screw out of the Armature Sleeve and releasing.

Check the Clutch is not sticking through excessive or old grease in the mechanism.

Ensure that the Sampler Controller is not either demanding too fast a sample grab rate (60 grabs per minute maximum at 50Hz operation), or that the signal to the solenoid is too fast.

If the above are satisfactory, than the Sampler will require a change of internal seals.

9.3 Sampler takes excessive sample

Check the external Check Valve fitted to Sampler Outlet Adapter is set to 7 Bar above line pressure for normal low pressure receiver systems and to 1 Bar where high pressure sample receivers are being used. If pressure is too low, then the internal Check Valve may be lifting allowing sample to pass at all times.

Ensure that the Sampler Controller is not either demanding too fast a sample grab rate (60 grabs per minute maximum at 50 Hz), or that the signal to the solenoid is too slow, and not allowing the clutch to disengage.

If the above are satisfactory, than the Sampler will require a change of internal seals, or the Clutch Spring may have broken, permitting the Sampler to grab continuously.

10 Sub Supplier Information

The following sub supplied items are used in the 710 Electric Sample Probe:

Euromotori Motor Series ASA 56 or Rilton Motor Type EP5L/J, selected to suit the application specific hazardous area and power supply requirements.

Honeywell Solenoid Coil (selected to suit application specific hazardous area requirements and power supply).

Neither component contains any user serviceable parts.

11 Recommended Spares List

When requesting assistance or spare parts, please advise the Sampler Model and Serial Numbers to ensure that the correct options are supplied.

Part/Sub- Assembly			Commissioning	1 Year Operation	2 Year Operation
Solenoid Coil (to suit application)			-	1	1
Spare Parts Kit 45-0170-00 comprising:			1	1	1
Item No.	Description	Part No.			
25	Clutch Spring	40-0200-00			
28	Half Nut	99-0013-00			
32	Spring	40-0201-00			
36	'O' Ring	37-0702-00			
47	Spring	40-0207-00			
49	Check Valve Tip	36-3129-00			
53	Seal	37-0570-00			
54	Seal	37-0730-00			
56	Circlip	37-0571-00			
58	Balseal	37-0573-00			
60 (2 off)	Slydring	37-0518-00			
61 (2 off)	Balseal	37-0540-00			
62	Circlip	37-0574-00			
67	Spring	40-0204-00			
69 (2 off)	'O' Ring	37-0572-00			
70	Spring	40-0089-00			
74	Circlip	37-0602-00			
75	Lower Spring Guide	36-3139-00			
78	'O' Ring	37-0581-00			
79	'O' Ring	37-0582-00			
Special Tool Kit 45-0173-00 comprising:			1	-	-
Description	Part No.				
'C' Spanner	36-2000-00				
External Circlip Pliers	36-2042-00				
Internal Circlip Pliers	36-2043-00				
8mm Allen Key	36-2044-00				
4mm Allen Key	36-2045-00				
Sample Plunger 'O' Ring Insertion Tool	36-2046-00				
Sample Plunger 'O' Ring Guide Tool	36-2047-00				
Sample Plunger 'O' Ring Hook	36-2048-00				
Sample Plunger Shaft Balseal Insertion Tool	36-2049-00				
Sample Plunger Shaft Balseal Insertion Guide	36-2050-00				

12 Product Specific Drawings

B23833 General Arrangement Drawing – 710 A Length Probe
 B23834 General Arrangement Drawing – 710 B Length Probe

13 Disclaimer

Whilst Jiskoot Autocontrol Limited has taken every care in the preparation of this document, it cannot accept responsibility for printing errors or omissions and does not warrant that it is correct and comprehensive in every particular. Equipment supplied should always be operated by persons with an appropriate level of skill and training.

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Further, this information is proprietary to Jiskoot Autocontrol Limited, and must not be disclosed to any third party except as may be required to operate the equipment supplied in accordance with the purposes for which it was sold by the persons properly licensed to operate it.

2	Revised to reflect use of 3 phase Euromotori Motor	P.Whittle	M.A.Jiskoot	16/2/2001
1	Drawings Added	P.Whittle	M.A.Jiskoot	22/12/1997
0	First issued	P.Whittle	M.A.Jiskoot	16/12/1997
Issue	Revision History	Issued	Approved	Date

Notes



Notes



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