Instruction Manual
For
E2-15 AFP Electric Drive Pump

- **Model 104125 (EU Model)**
- **Model 104135 (USA Model)**
- **Model 104134 (Japan Model)**

Product Description / Object of Declaration:	**Electric Pump E2, E4**	**EN**
This Product is designed for use with:	Solvent and Water based Materials	
Suitable for use in hazardous area:	Zone 1	
Protection Level:	II 2 G X IIB T4 (Pump) II 2 G Exd/Exde IIB T4 IP55 (Motor) CE0722 II 2 GD ck T4 (Gearbox)	
Notified body details and role:	TRAC Global Ltd (0891) Lodging of Technical file	
This Declaration of conformity / incorporation is issued under the sole responsibility of the manufacturer:	Finishing Brands UK Ltd, Ringwood Road, Bournemouth, BH11 9LH. UK	

EU Declaration of Conformity

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Machinery Directive 2006/42/EC
ATEX Directive 2014/34/EU
Pressure Equipment Regulations 97/23/EC
EMC Directive 2014/30/EU
by complying with the following statutory documents and harmonized standards:
EN ISO 12100:2010 Safety of Machinery - General Principles for Design
EN 12621:+A1:2010 Machinery for the supply and circulation of coating materials under pressure - Safety requirements
EN1127-1:2011 Explosive atmospheres - Explosion prevention - Basic concepts
EN 13463-1:2009 Non electrical equipment for use in potentially explosive atmospheres - Basic methods and requirements
EN 13463-5:2011 Non electrical equipment for use in potentially explosive atmospheres - Protection by constructional safety
EN 13463-8:2003 Non-electrical equipment for potentially explosive atmospheres. Protection by liquid immersion 'k'
EN 60079-0:+A11:2013 Explosive atmospheres - Equipment. General requirements
EN 60079-1:2014 Explosive atmospheres - Equipment protection by flameproof enclosures "d"
EN 60079-7:2015 Explosive atmospheres. Equipment protection by increased safety "e"
IEC 60072:1991 Rotating electrical machine FT flange class
EN 60034-1: 2010 Rotating electrical machines

Providing all conditions of safe use / installation stated within the product manuals have been complied with and also installed in accordance with any applicable local codes of practice.

Signed for and on behalf of Finishing Brands UK Ltd:  D Smith 20/4/16 Director of Sales (EMEA) Bournemouth,BH11 9LH,UK

Specification	
Pump Nominal Stroke	50 mm (1.97 ins)
E2-15 Maximum Fluid Pressure	20 bar (290 psi)
E2-15 Nominal Flow Volume / Cycle	0.375 Litres (0.10 US Gall)
E2-15 Fluid Output @ 20 HZ (10 cycles/min)	3.75 Litres / min (1.0 US Gall / min)
E2-15 Fluid Output @ 80 HZ (40 cycles/min)	15.0 Litres / min (4.0 US Gall / min)
Fluid Inlet / Outlet Connections	1” Sanitary
Gearbox Ratio	56:1
Gearbox Oil Quantity (EP ISO VG 220 Mineral Oil) (EU Model)	1.7 Litres (0.45 US Gall)
Gearbox Oil Quantity (SHC 630 Synthetic Oil) (USA Model)	Litres (US Gall)
AC Induction Electric Motor -EU Model 0.75 kW 4Pole 1400 RPM (0.75 kW 4Pole 1400 RPM Japan Model)	400V 3PH 0.75 kW @ 50HZ EEx d 11B T3 Rated 20 to 80 Hz (with thermisters)
AC Induction Electric Motor - USA Model	460V 3PH 1 Hp @ 60HZ Class 1, Group D. Rated 20 to 80 Hz (c/w thermostats)
Total Weight of Pump (inc electric motor)	80 Kg (176 Lb)
Max. Inlet Pressure	7 Bar (101 psi)

WARNING

Directions for Working Safety

This Product has been constructed according to advanced technological standards and is operationally reliable. Damage may, however, result if it is used incorrectly by untrained persons or used for purposes other than those for which it was constructed.

The locally current regulations for safety and prevention of accidents are valid for the operation of this product under all circumstances.

International, national and company safety regulations are to be observed for the installation and operation of this product, as well as the procedures involved in maintenance, repairs and cleaning.

These instructions are intended to be read, understood and observed in all points by those responsible for this product. These operating and maintenance instructions are intended to ensure trouble free operation. Therefore, it is recommended to read these instructions carefully before start-up. Binks PCE cannot be held responsible for damage or malfunctions resulting from the non-observance of the operating instructions. These instructions including regulations and technical drawings may not be copied, distributed, used for commercial purposes or given to others either in full or in part without the consent of Binks PCE.
We reserve the right to alter drawings and specifications necessary for the technical improvement of this product without notice.

Equipment Misuse Hazard

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose.
- Do not alter or modify this equipment. Use only genuine Binks PCE parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure stated on the equipment or in the Technical Data for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the Technical Data section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose hoses to temperatures above 82°C (180°F) or below —40°C (—40°F).
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

Fire, Explosion and Electric Shock Hazard

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire, explosion, or electric shock.

When installed and operated in accordance with its instructions, the pump is approved for operation in Zone 1 (Europe) & Division 1 (North America), hazardous locations. (ATEX Cat 2)

- Electrical equipment must be installed, operated, and serviced only by trained, qualified personnel who fully understand the requirements stated in this instruction manual.
- Ground the equipment and all other electrically conductive objects in the spray area. After grounding test with ohmmeter to ensure earth continuity is 1 ohm or less.
- Keep all covers tight while the motor is energized.
- If there is any static sparking or you feel an electric shock while using this equipment, stop spraying/dispensing immediately. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the build up of flammable fumes from solvents or the fluid being pumped.
- Keep the pumping area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the pumping area.
- Extinguish all open flames or pilot lights in the spray/dispense area.
- Do not smoke in the spray/dispense area.
- Do not turn on or off any light switch in the spray/dispense area while operating or if fumes are present.

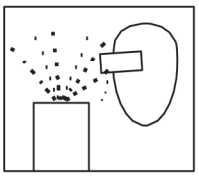
WARNING

READ THE MANUAL
Before operating equipment, read and understand all safety, operation and maintenance information provided in the operation manual.

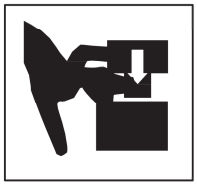
DE-ENERGIZE, DEPRESSURIZE, DISCONNECT AND LOCK OUT ALL POWER SOURCES DURING MAINTENANCE
Failure to De-energize, disconnect and lock out all power supplies before performing equipment maintenance could cause serious injury or death.

OPERATOR TRAINING
All personnel must be trained before operating equipment.

KEEP EQUIPMENT GUARDS IN PLACE
Do not operate the equipment if the safety devices have been removed.



PROJECTILE HAZARD
You may be injured by venting liquids or gases that are released under pressure, or flying debris.



PINCH POINT HAZARD
Moving parts can crush and cut. Pinch points are basically any areas where there are moving parts.

MAGNETIC FIELD PRESENT
You may be subjected to magnetic fields which may interfere with the operation of certain pacemakers.

WEAR SAFETY GLASSES
Failure to wear safety glasses with side shields could result in serious eye injury or blindness

NOISE HAZARD
You may be injured by loud noise. Hearing protection may be required when using this equipment.

KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY

HIGH PRESSURE CONSIDERATION
High pressure can cause serious injury. Relieve all pressure before servicing. Hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury.

AUTOMATIC EQUIPMENT
Automatic equipment may start suddenly without warning.

PROP 65 WARNING
WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

MAGNET HAZARD
Take care when handling magnets.
Avoid getting magnets in close proximity of each other. Injury or damage to magnets may results.

Installation – General

The E2-15 AFP Pump Units are designed for location in Zone 1 Hazardous areas, ATEX Category 2. Electrical connections must be in accordance with Local regulations for installation in Hazardous areas.

It is recommended that a Local Control Box is positioned in close proximity to the pump, as a convenient local Start / Stop facility and Junction box. The main Pump Control Panel must be positioned within an Electrically Safe Area.

A Pressure switch (and/or Pressure relief valve) must be connected to the outlet manifold port and set to stop the pump (or relieve the fluid pressure) in the event of the system overpressure e.g. blocked paint filter. This is necessary to protect the Pump mechanics from overload. An adapter to mount a pressure switch and pressure sensor is available, see accessories.

It is recommended that the switch setting is set to 1 bar (14.5 psi) above the maximum required pressure. The maximum Pressure setting the pressure switch should be set to is 21 bar (305 psi).

The pressure switch must be fitted and functioning correctly before the pump is put into use otherwise Pump warranty may be invalidated.

Attach suitable hoses (20 bar maximum working pressure) to the inlet and outlet connections. E.g. 28 mm NB Inlet and 25 mm NB Outlet hose.

Secure the Pump assembly to the floor (or purpose designed support steelwork) using the 4 off Ø10 mm holes in the base of the pump support frame.

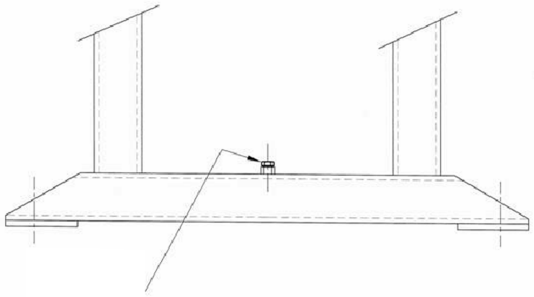
Ensure adequate air space around the Pump for maintenance and electric motor cooling requirements.

Ensure the gearbox is filled with oil. (The gearbox is filled with the correct amount of oil at the factory)

Electric Motor

Electric Motors for hazardous areas are specially designed to comply with official regulations concerning the risk of explosion. If improperly used, badly connected, or altered no matter how minor, their reliability could be in doubt.
Standards relating to the connection and use of electrical apparatus in hazardous areas must be taken into consideration. Only trained personnel familiar with these standards should handle this type of apparatus.

The Pump Frame must be wired to a suitable earth ground to ensure that there is no possibility of static build up



M6 HEX. HEAD SCREW FOR PUMP EARTH GROUNDING

Installation – Electrical

Inverter

The pump cycle rate and thus the fluid output is controlled by adjusting the motor speed, this is achieved by changing the electrical frequency input to the motor between the range of 20 and 80 Hz.

A suitable 3PH AC inverter must be used to control the motor speed,

Where the customer provides a suitable inverter then the following parameters are to be used.

Important! The electric motor is certified for use in a hazardous area between frequencies of 20 Hz an 80 Hz, therefore it is essential that this range cannot be inadvertently exceeded by the operator as this will invalidate the certification and use of the electric motor.

Required European Inverter Settings	Value
Maximum Hz output	80 Hz
Minimum Hz output	20 Hz
Acceleration Ramp	5 Seconds
Deceleration Ramp	0.1 Seconds
Rated Motor Power	0.75 kW
Rated Motor Current	2 A
Rated Motor Voltage	400 V
Rated Motor speed	1440 RPM
Rated Motor Power Factor	0.81
Rated Motor Efficiency	78 %
Rated Motor Frequency	50 Hz

Application Criteria

In a general manner inverters can be connected directly to the power supply line without line reactors. But in this case, ensure the following:
To prevent damage to the inverter and to ensure its expected life, minimum line impedance that introduces a voltage drop of 1%, as a function of the motor load, should be used. If the line impedance (transformers + wirings) is lower than these values, it is recommended to use line reactor.

System Operation

Before starting: -

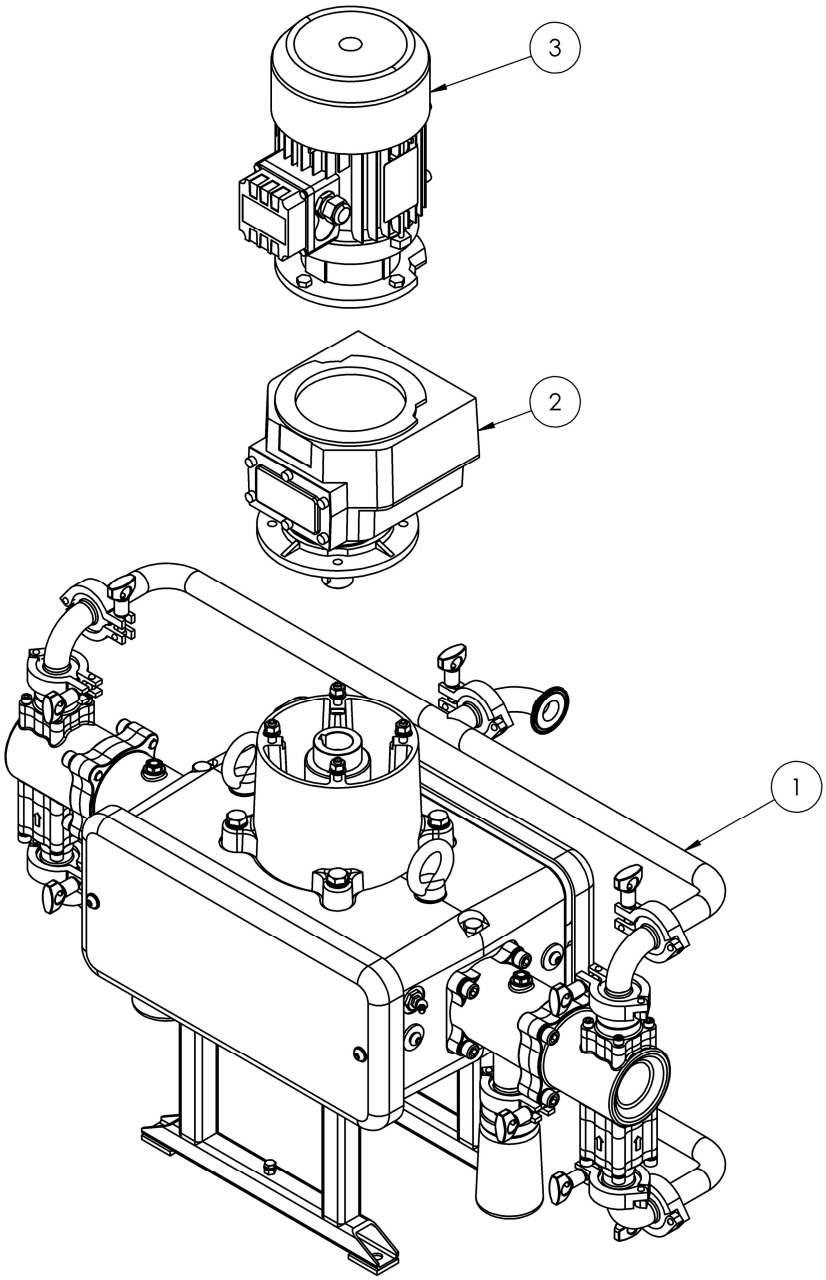
- Ensure all electrical and mechanical connections are correctly made.
- All required interlocks are tested and operational.
- Suitable material for pumping is available at the suction hose.
- The outlet connection is not blocked or isolated by any valves.
- Check the gearbox oil level, top up as necessary with the correct grade (see maintenance section) and that the gearbox ventilator is fitted.
- Cam rotation must be clockwise.

Set the pump speed to the minimum frequency 20 HZ and. Inspect for any leaks. After 3-4 minutes run the pump at 60-80 Hz to remove any air from the inlet & outlet pipework. Run pump for 10 minutes. Reduce speed to 30 Hz and slowly increase pressures, checking for leaks, after testing set pump to open or closed loop as required.

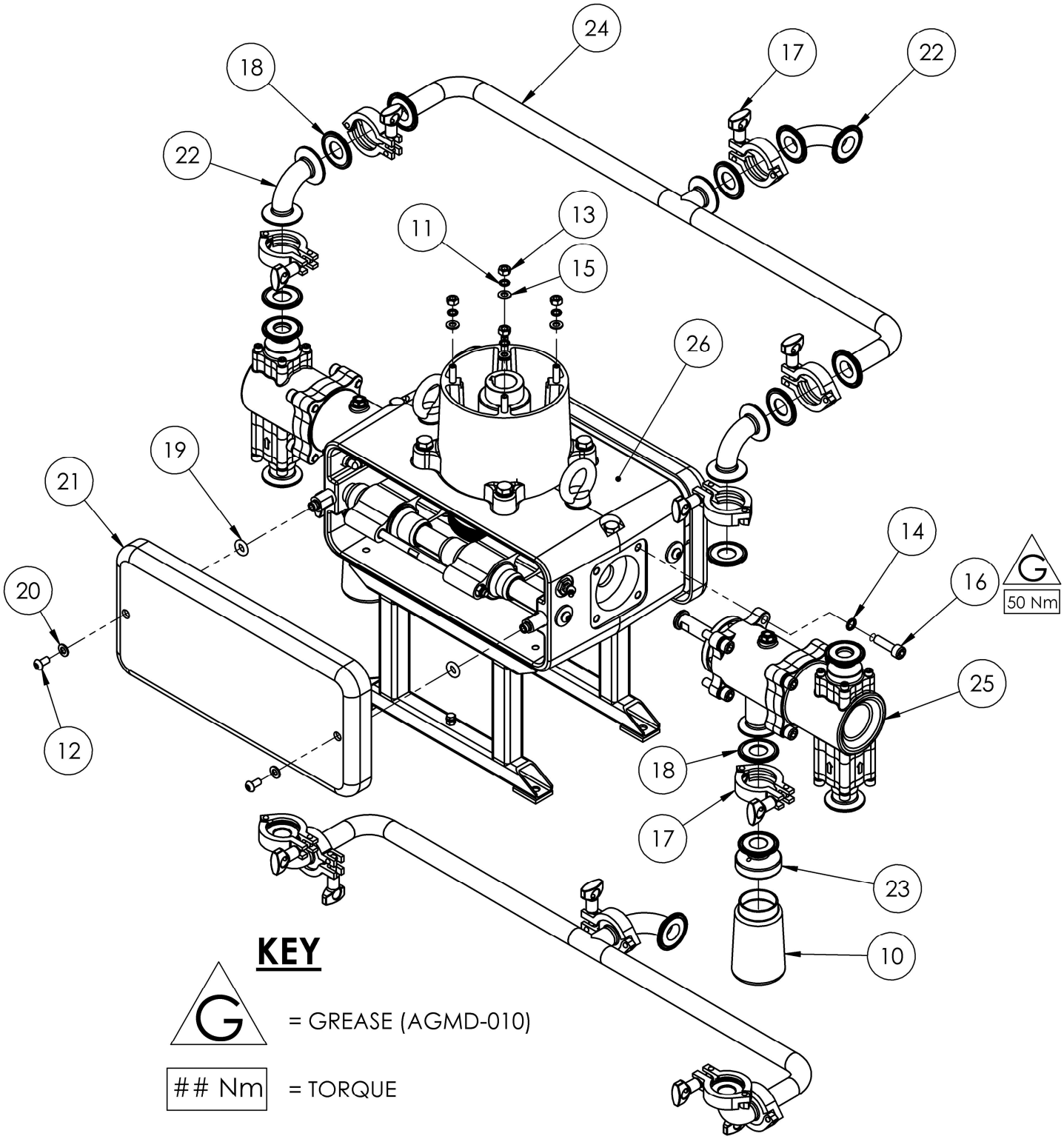
Set the pump cycle rate to achieve the required paint volume and then adjust the system back pressure regulator to achieve the desired system fluid pressure. Refer to Fluid Output Table for comparison of fluid output relative to Inverter frequency and Pump cycle rate.

The return line 'back pressure' regulator responds to the changes in system fluid flow demand, (due to variable paint usage) by dynamically adjusting the paint flow rate returning to the system paint tank, thus maintaining the set pressure.

Motor Speed Fluid Output Table			
Motor Speed HZ	**Pump Speed Cycles/min**	**Fluid Flow Rate Litres/min**	**Fluid Flow Rate US Gall/min**
20	**10.0**	**3.75**	**1.0**
25	**12.5**	**4.69**	**1.25**
30	**15.0**	**5.62**	**1.5**
35	**17.5**	**6.56**	**1.75**
40	**20.0**	**7.50**	**2.0**
45	**22.5**	**8.44**	**2.25**
50	**25.0**	**9.37**	**2.5**
55	**27.5**	**10.31**	**2.75**
60	**30.0**	**11.25**	**3.0**
65	**32.5**	**12.19**	**3.25**
70	**35.0**	**13.12**	**3.5**
75	**37.5**	**14.06**	**3.75**
80	**40.0**	**15.00**	**4.0**

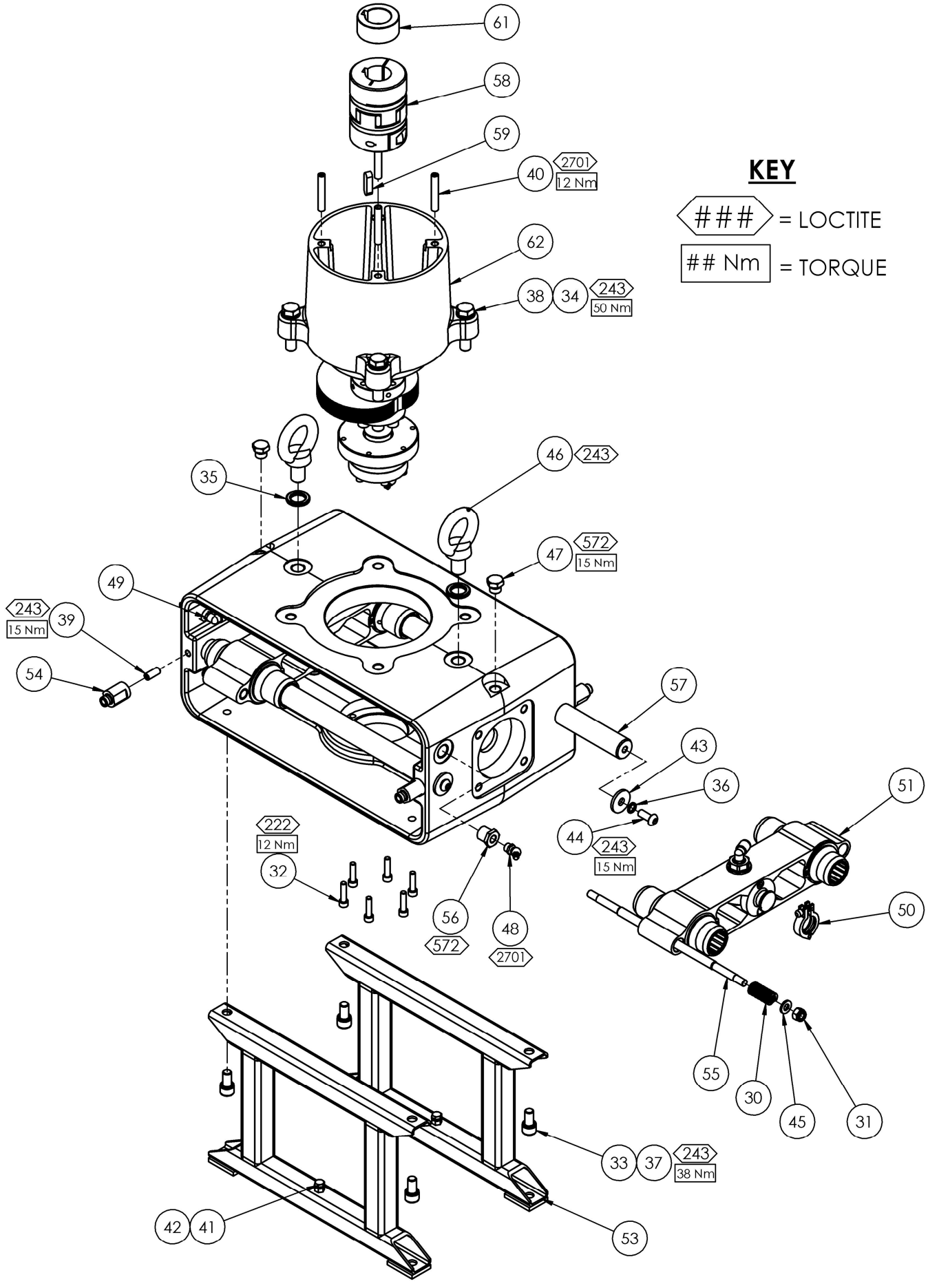


Parts List – E2-15 AFP PUMP ASSEMBLY				
ITEM	PART No	DESCRIPTION	QTY	REMARKS
1		E2-15AFP PUMP	1	
2	193089	GEARBOX (EU)	1	
2	193090	GEARBOX (USA)	1	
2	193091	GEARBOX (JAPAN)	1	
3	192877	0.75Kw ELECTRIC MOTOR (EU)	1	
3	193092	0.75KW ELECTRIC MOTOR (JAPAN)	1	
3	193093	1 HP ELECTRIC MOTOR (USA)	1	BALDOR
3	193118	1 HP ELECTRIC MOTOR (USA)	1	MARATHON


24
18
17
22
22
11
13
15
26
19
21
14
16
G
50 Nm
20
25
12
18
17
23
10
KEY
G = GREASE (AGMD-010)
Nm = TORQUE

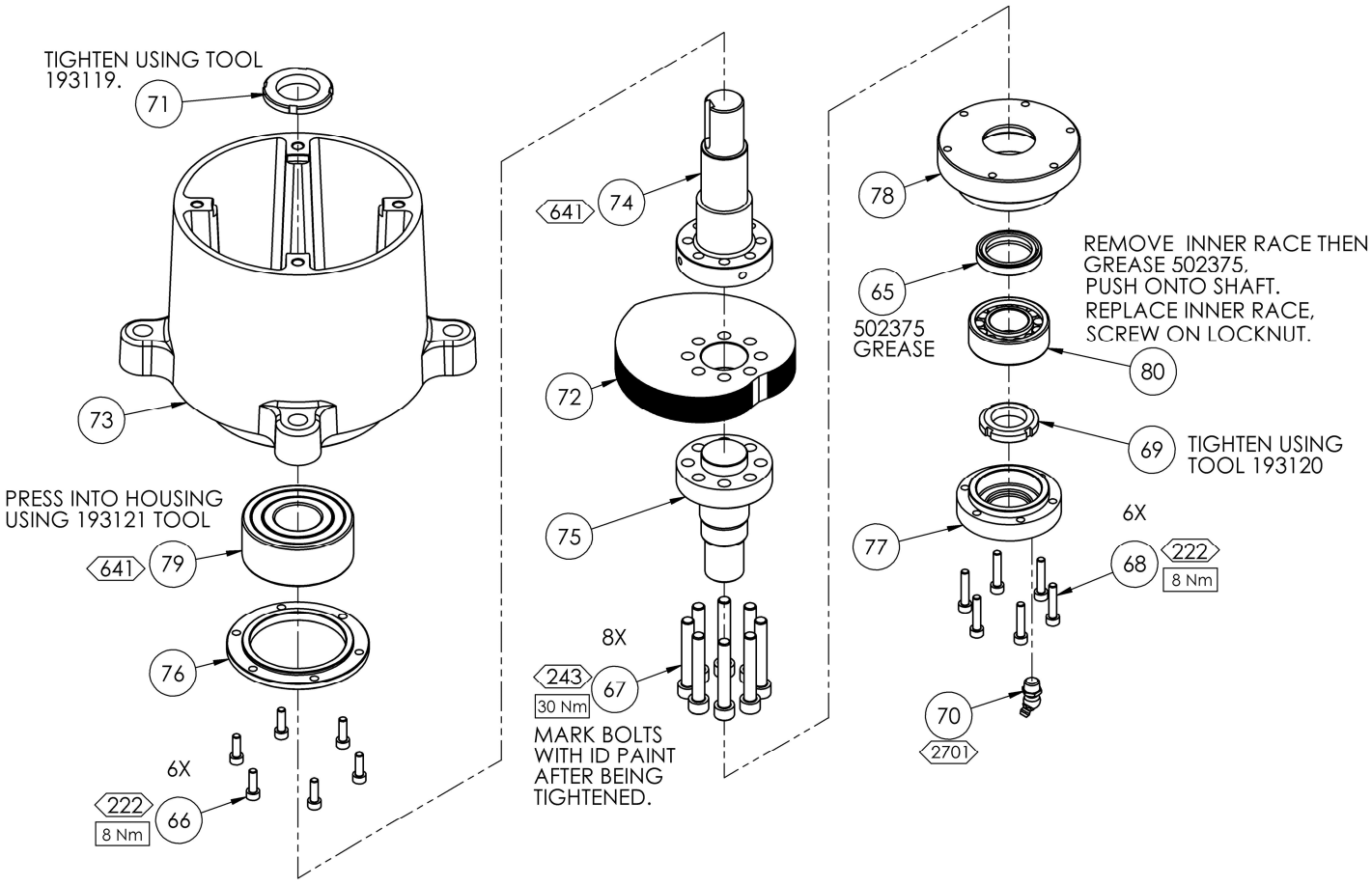
Parts List – E2-15 AFP PUMP ASSEMBLY

ITEM	PART No	DESCRIPTION	QTY	REMARKS
10	207-12333	BOTTLE	2	
11	165108	M8 SPRING WASHER	4	
12	164474	M8 x 16 TORX SCREW (ST ST)	4	
13	163144	M8 HEXAGON NUT	4	
14	165123	Ø10 SPRING WASHER (STST)	8	
15	165134	Ø8 Washer	4	
16	165947	M10 x 35 CAP HD SCREW	8	
17	192009	1 & 1 1/2 SANITARY CLAMP	12	
18	192206	1 SANITARY GASKET PTFE	12	❶❷
19	192440	Ø10.4 'O' RING (COVER)	4	
20	192485	M8 WASHER (NYLON)	4	
21	192866	COVER	2	
22	194109	1" SANITARY ELBOW	6	
23	194182	BOTTLE ADAPTOR	2	
24	194186	MANIFOLD	2	
25	194188	E2-15 AFP FLUID SECTION ASSY	2	
26	194189	E2-15 AFP MECHANICAL ASSY	1	


KEY
= LOCTITE
Nm = TORQUE
61
58
59
40
2701
12 Nm
62
38
34
243
50 Nm
46
243
35
47
572
15 Nm
49
243
15 Nm
39
54
57
43
36
51
44
243
15 Nm
222
12 Nm
32
56
572
48
2701
50
55
30
45
31
33
37
243
38 Nm
42
41
53

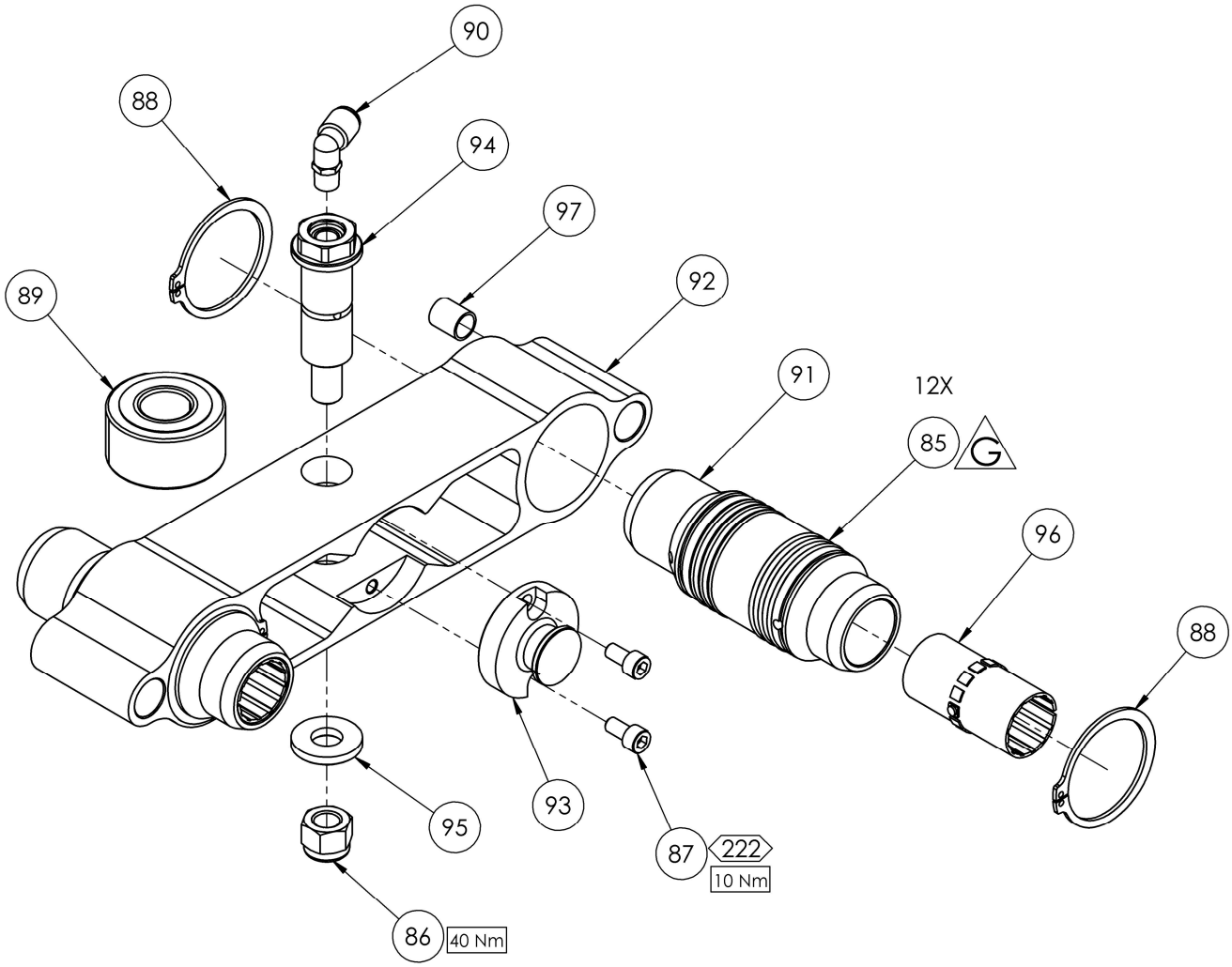
Parts List – 194189 MECHANICAL ASSEMBLY

ITEM	PART No	DESCRIPTION	QTY	REMARKS
30	160524	CARRIAGE SPRING	4	
31	163161	M8 NYLOC NUT - STST	4	
32	163921	M6 x 25 CAP HD SCREW	6	
33	164471	M10 x 20 CAP HD SCREW	4	
34	165044	M12 SPRING WASHER	4	
35	165100	M16 SPRING WASHER	2	
36	165108	M8 SPRING WASHER	4	
37	165123	Ø10 SPRING WASHER	4	
38	165351	M12 x 50 HEX HEAD BOLT	4	
39	165661	M8 x 20 - GRUBSCREW	4	
40	165667	M8 x 50 GRUBSCREW	4	
41	165958	M6 x 20 HEX HD SCREW	2	
42	165959	M6 WASHER	2	
43	177020	M8 MUDGUARD WASHER	4	
44	177021	M8 x 20 BUTTON HEAD CAPSCREW	4	
45	192400	SPRING RETAINING WASHER	4	
46	192441	M16 EYE BOLT	2	
47	192551	HEXAGON PLUG - 1/4 BSP	2	
48	192650	1/8 x 45 GREASE NIPPLE	2	
49	192661	1/8R - 6MM PUSH IN ELBOW	2	
50	192668	SHAFT CLAMP ASSY	2	
51	192849	CARRIAGE ASSEMBLY	2	
52	192854	MAIN BODY MACHINING	1	
53	192860	MOUNTING FRAME	2	
54	192865	COVER SPACER	4	
55	192869	LINEAR SPRING PIN	2	
56	192870	GREASE BULKHEAD	2	
57	192872	LINEAR BEARING ROD	2	
58	192875	DRIVE SHAFT COUPLING	1	192876 spider
59	192878	8 x 7 x 30 KEY	1	❸
60	192880	Ø6 GREASE HOSE	2	NOT SHOWN
61	193695	Ø30 SHAFT COUPLING SPACER	1	
62	194198	E2-15 BELL HOUSING CAM	1	

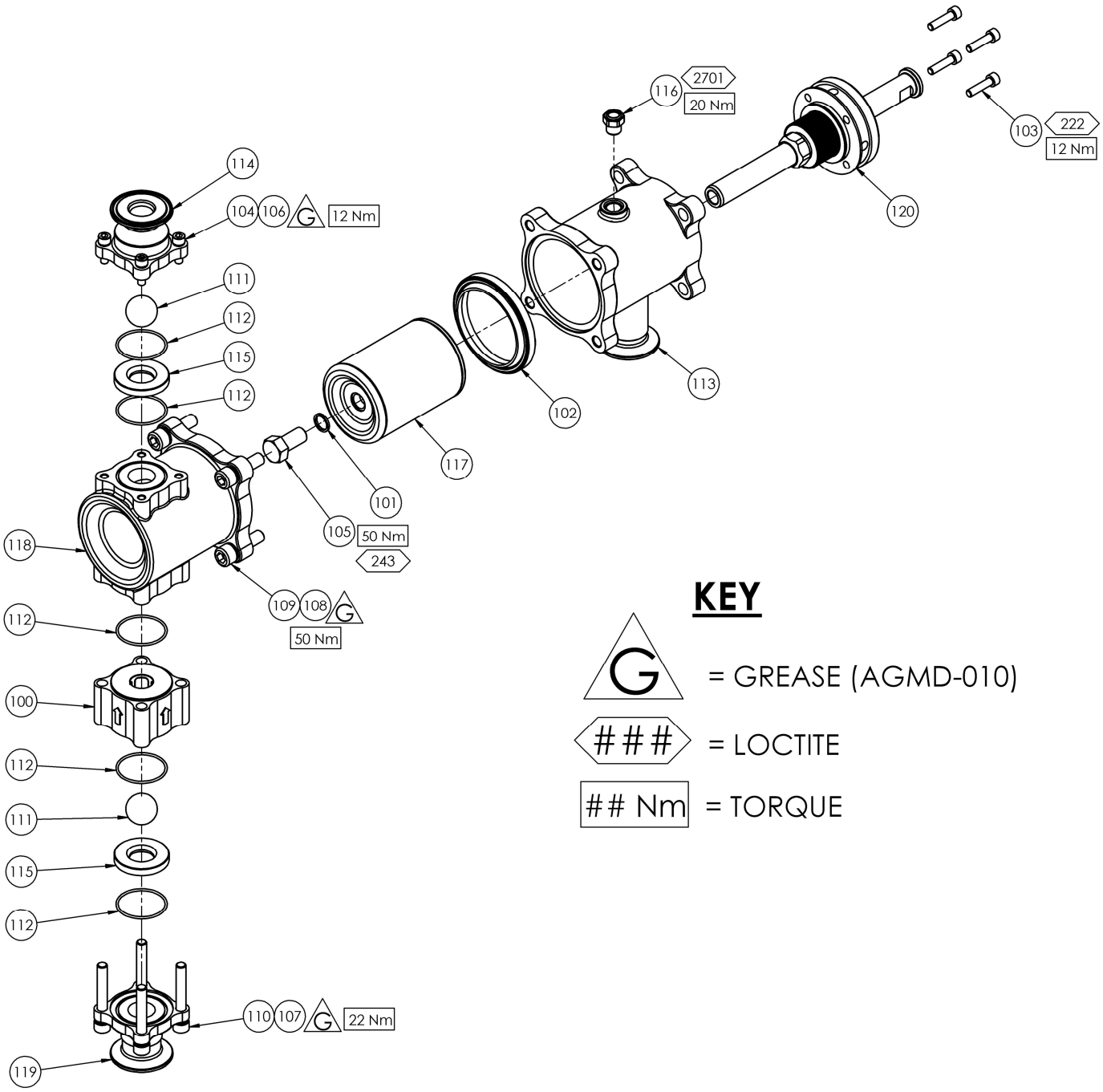


Parts List – 194198 BELL HOUSING CAM ASSEMBLY

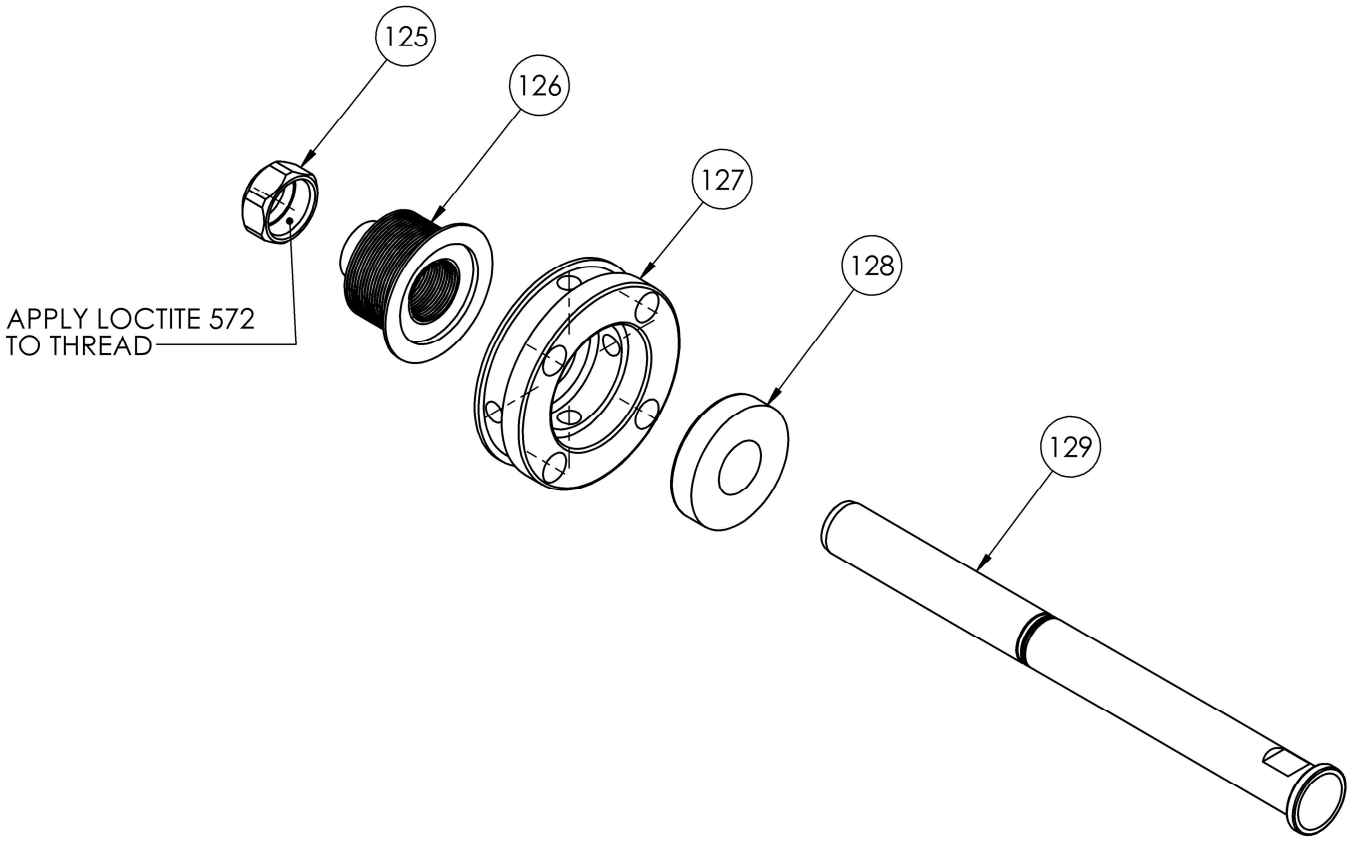
ITEM	PART No	DESCRIPTION	QTY	REMARKS
65	162709	Ø30 x Ø42 x 7 SEAL	1	❸
66	163960	M5 x 16 CAP HD SCREW	6	
67	165558	M8 x 50 CAP HD SCREW	8	
68	165972	M5 x 25 CAP HD SCREW	6	
69	165974	M25 BEARING LOCKNUT	1	
70	192650	1/8 x 45 GREASE NIPPLE	1	
71	192703	M30 BEARING LOCKNUT	1	
72	192850	CONSTANT VELOCITY CAM	1	
73	192853	BELL HOUSING MACHINING	1	
74	192855	TOP SHAFT	1	
75	192856	BOTTOM SHAFT	1	
76	192857	TOP BEARING CAP	1	
77	192858	BOTTOM BEARING CAP	1	
78	192859	BOTTOM BEARING HOUSING	1	
79	192873	Ø30 x Ø72 x 30.2 BALL BEARING	1	❸
80	192874	Ø25 x Ø52 ROLLER BEARING	1	❸



Parts List – 192849 CARRIAGE ASSEMBLY				
ITEM	PART No	DESCRIPTION	QTY	REMARKS
85	162734	Ø41 x 1.78 SECTION 'O' RING	12	
86	163159	M12 NYLOC NUT	1	
87	165542	M6 x 12 CAP HD SCREW	2	
88	166156	Ø46 EXTERNAL CIRCLIP	4	
89	192392	Ø47 CAM FOLLOWER	1	
90	192661	1/8R - 6MM PUSH IN ELBOW	1	
91	192851	LINEAR BEARING HOUSING	2	
92	192852	LINEAR BEARING CARRIAGE	1	
93	192861	CARRIAGE ADAPTOR	1	
94	192862	CAM FOLLOWER PIN	1	
95	192863	FOLLOWER NUT WASHER	1	
96	192871	Ø25 LINEAR BEARING	4	
97	193112	9 X 12 X 14 LINEAR BEARING	2	


116
2701
20 Nm
103
222
12 Nm
114
104
106
G
12 Nm
120
111
112
115
112
113
102
117
101
105
50 Nm
243
118
109
108
G
50 Nm
112
100
112
111
115
112
110
107
G
22 Nm
119
KEY
G = GREASE (AGMD-010)
= LOCTITE
Nm = TORQUE

Parts List – 194188 FLUID SECTION ASSEMBLY				
ITEM	PART No	DESCRIPTION	QTY	REMARKS
100	41-4404	BALL CAGE	1	
101	41-4415	PISTON BOLT SEAL	1	❶❷
102	162844	PISTON SEAL	1	❶❷
103	163921	M6 x 25 CAP HD SCREW	4	
104	163952	M6 x 20 CAP HD SCREW	4	
105	164031	1/2-20 X 1 HEX HD SCREW	1	❶❷
106	165087	M6 SPRING WASHER	4	
107	165108	M8 SPRING WASHER	4	
108	165123	Ø10 SPRING WASHER	4	
109	165947	M10 x 35 CAP HD SCREW	4	
110	165990	M8 x 55 CAP HD SCREW	4	
111	192382	Ø25.4 BALL	2	❷
112	192712	O-RING Ø37.82 x 1.78 PTFE	5	❶❷
113	192825	INLET CYLINDER	1	
114	192827	OUTLET CHECK	1	
115	192833	SEAT	2	❷
116	193245	¼" BRASS SILENCER	1	
117	194105	CERAMIC PISTON	1	
118	194178	OUTLET CYLINDER MACHINING	1	
119	194179	INLET ADAPTOR MACHINING	1	
120	194187	E2-15 AFP SHAFT & BELLOWS ASSY	1	



Parts List – 194187 SHAFT & BELLOWS ASSEMBLY				
ITEM	PART No	DESCRIPTION	QTY	REMARKS
125	192374	RETAINING NUT	1	
126	192579	KNIFED BELLOWS	1	❷
127	192627	BELLOWS SPACER	1	
128	192628	SHAFT SEAL	1	❷
129	194185	PISTON SHAFT	1	

Maintenance – General

The working life and thus the expected life prior to replacement of parts within a Paint Pump are greatly affected by three main factors: -

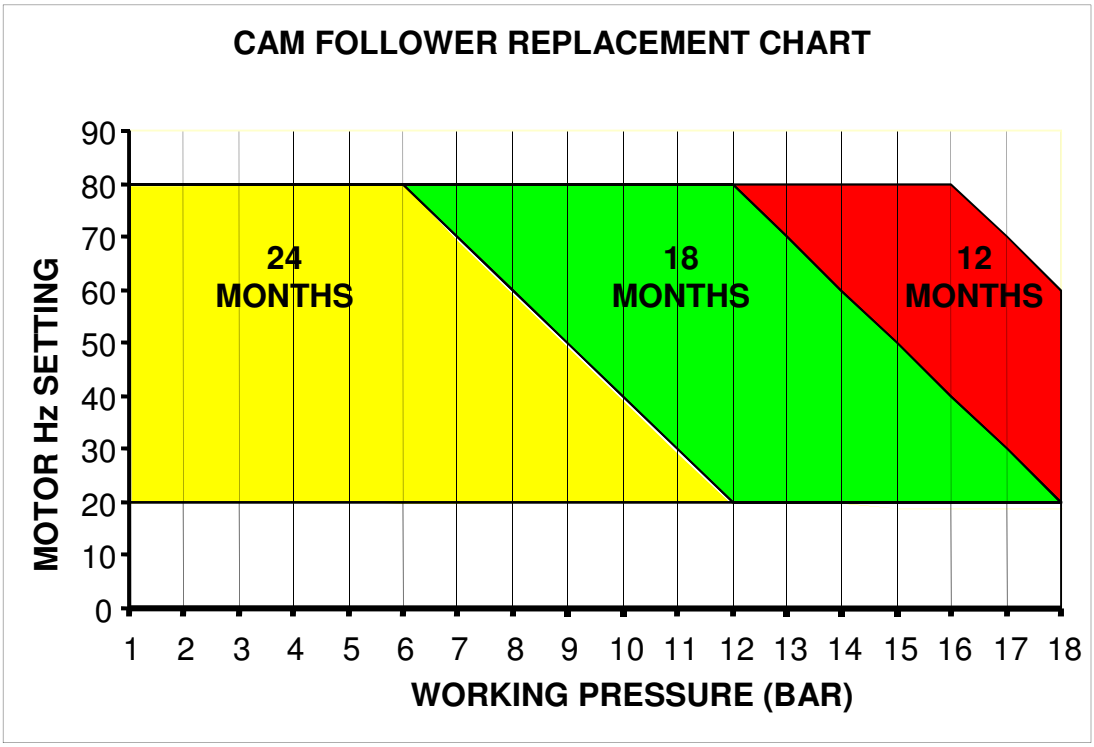
- Abrasiveness of Fluid Pumped
- Pump Duty Cycle
- Fluid Pressure Output requirement

The two components which are more greatly affected by the above criteria than any other components in the pump are: The Main piston Seal and the Cam Follower ; it is therefore recommended that these two items are stocked as spare parts in addition to the recommended spare parts kits.

A useful design feature of the Pump is that only one side of the Cam is under load during operation (Pushing the cam Follower); therefore the life of this component is doubled by reversing the position of the cam on the shaft when excessive wear has taken place.

It is also a requirement of the E.U. ATEX directive (Use of Equipment in Potentially Explosive Atmospheres) that any Bearings should be replaced when they have reached 90% of their calculated operational life. The following chart is included as a helpful guide, as the working life of the Cam Follower bearings used in the Pump is greatly dependant upon the Duty Cycle and Fluid Pressure Output Requirement.

Before any maintenance always switch off the pump and secure against any unintentional start up.



Maintenance – General

Maintenance Schedule	
Inspection	**Operation**
Daily	Check for any fluid leakage.
Weekly	Check for any excessive mechanical noise Check for excessive fluid pressure pulsation
3 Monthly	Grease Cam Follower Bearings (2 off) with 502375 grease. while the pump is running. Inject about 8 full strokes from a standard grease gun fitted with a standard collet connector.
6 Monthly	Grease Main Shaft Bearing with 502375 grease Check Gearbox Oil Level. Inspect Linear Bearings (96), Rod (57), Cam (72) and Cam followers (89) for excessive wear, replace if excessive wear can be felt or seen.
Annually	Inspect Piston (117) and replace if damaged. Replace Piston Seals (102), Bellows (126). Inspect Piston & Outlet Ball Checks, replace as necessary.
Every 5 Years	Replace main shaft bearings. Linear Guide Bearings, Guide Rails and Cams if excessive wear can be seen.
Use only 502375 (KP2N-20 DIN 51825) Grease for Cam Follower Bearing.	

Maintenance – Initial Run Period

Following approximately 1 month running of the pump remove the cover and grease all bearings. Remove any excess grease and any dust particles present in the cam area, (Any particles present are from the cam follower tyre, this is a normal function of the bearing ‘bedding in’ with the cam surface).

Maintenance – Gearbox / Motor

Wait until the unit has cooled sufficiently after stopping and isolation.

Gearbox

Every 1000 hours verify the good condition of oil seals and gaskets.

Oil Plugs / Ventilator

Remove the ventilator plug prior to removing level and/or drain plug.
The gearbox is supplied factory fitted with (see chapter 1.3) oil, only 'top up' with the same type of oil and never overfill as this may cause overheating and leakage. Check the ventilator is clean and fitted correctly.
If changing the oil place a suitable container underneath the plug for draining.
Note: It is recommended that the oil should be warm (40-50º C) to facilitate easier draining.
After filling with fresh oil refit the ventilator, level and/or drain plugs and clean up any oil spillage. *Not applicable for sealed for life units.*

Lubrication

Check the oil level every 3,000 hours or 6 months top up if applicable.
Replace gearbox oil as per Gearbox manufacturer's instructions (ATEX regulations).
Never mix different oil types.

Electric Motors

Maintenance of Ex Motors - are reported by EN 60079-17 standard, in particular:-

-The electric connections must be correctly locked to avoid resistance-increases, with consequent contact overheating.
- The insulation air-distance and the surface-distance between conductors, required by the standards, must be respected.
- All the screws, used to assemble the parts of the motors and of the terminal box, must be completely tightened.
- The replacement of seals and of components for cable entrance would be made using spare parts, supplied from the manufacturer, in order to guarantee the original type of protection.
- The Ex joint surfaces have not to be machined and it is not allowed to insert, between them, any kind of seals, not foreseen or supplied from the manufacturer. The join surfaces have just to be cleaned and, in order to avoid corrosion or water entrance.

Repair procedures of the Ex motors - are reported by IEC 79-19 standard.
When it is not possible to make the repairs of Ex motors at the manufacturer's plant, the outside workshops, deputed to this task, must be endowed by the necessary capability, including:
- Sufficient technical knowledge of these motors.
- Factory equipment with tooling and facilities, suitable to make repairs.
- Quality control department, for the checks and the tests, requested after repairs.
- For the Ex motors the repairs of parts, directly involved on the protection against the explosion risk, must be done without any modification to the original motor design.

Fault Finding

Symptom	Possible Cause	Remedy
Mechanics		
Gearbox Output shaft does not rotate, even though the motor is running.	Drive between shafts in the gear unit interrupted	Return the unit for repair and replace gearbox
Gearbox Oil leaking • from the gear unit cover • from the motor flange • from the gear unit flange • from the output oil seal	a) Defective gasket on gear unit cover. b) Defective gasket. c) Gear unit not ventilated.	a) Retighten screws on gear unit cover. b) Return gearbox c) Check vent is clean/fitted and not the transportation plug
Gearbox Oil leaking from ventilator	a) Unit Overfilled with oil.	Check and correct the oil level
Cam Followers bearing generating heat / noise	Bearing needs lubrication	Grease bearing or replace if damage is too great
Carriage does not maintain contact with cam	a) Spring tension insufficient b) Fluid seal friction or piston movement prevented	Check and replace springs Check fluid section
Noisy Changeover	Coupling spider worn	Replace green spider coupling
Fluid Section		
Pump will not 'Prime'	a) Air entering the suction hose/manifold b) Worn piston seals c) Ball checks not seating correctly	a) Check o-rings and hose connections b) Replace piston seals c) Inspect, clean/replace balls/seats
Pump will not run	a) No power b) Inverter Unit or safety interlocks 'tripped'	a) Check electrical supply b) Check inverter and fault conditions
Pump runs but lack of pressure	a) Worn piston seals b) Ball checks not seating correctly	a) Replace piston seals b) Inspect, clean/replace balls/seats
Paint leaking from inside cover	Bellows seal failure	Replace bellows seal Check Piston seal, replace as necessary
Excessive Pressure Pulsation	a) Ball checks not seating correctly b) Main shaft bearings worn c) Cam follower worn	a) Inspect, clean/replace balls/seats b) Replace bearings c) Replace bearings

Testing and Lubricating

Testing and Lubrication (Qualified personnel only)

1. Connect pump to paint system.
2. Connect electric motor to a suitable electrical supply.
3. Fit the gearbox vent plug.
4. Turn on paint system and set back pressure regulator to zero.
5. Turn the pump on at the local isolation mounted switch. (Important – Never allow the pump to run with a closed ('valved off') inlet or outlet connection)
6. Allow the pump to run for about 10 minutes between 60 to 80Hz to ensure any trapped air is correctly vented. Check for any leaks and mechanical noises.
7. While running apply *(502375)* grease to cam follower bearings, 8 strokes of a standard 'cartridge' grease gun (502373).
8. While running apply *(502375)* grease to main shaft bearing (40 strokes of a grease gun on a new bearing and 6 pumps on a bearing in current use)
9. Run the pump at 20 cycles/min (50 HZ) and increase the back pressure to 10 Bar and run for 1 hour. Check for any leaks and mechanical noises.

Fluid Drain Down

Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

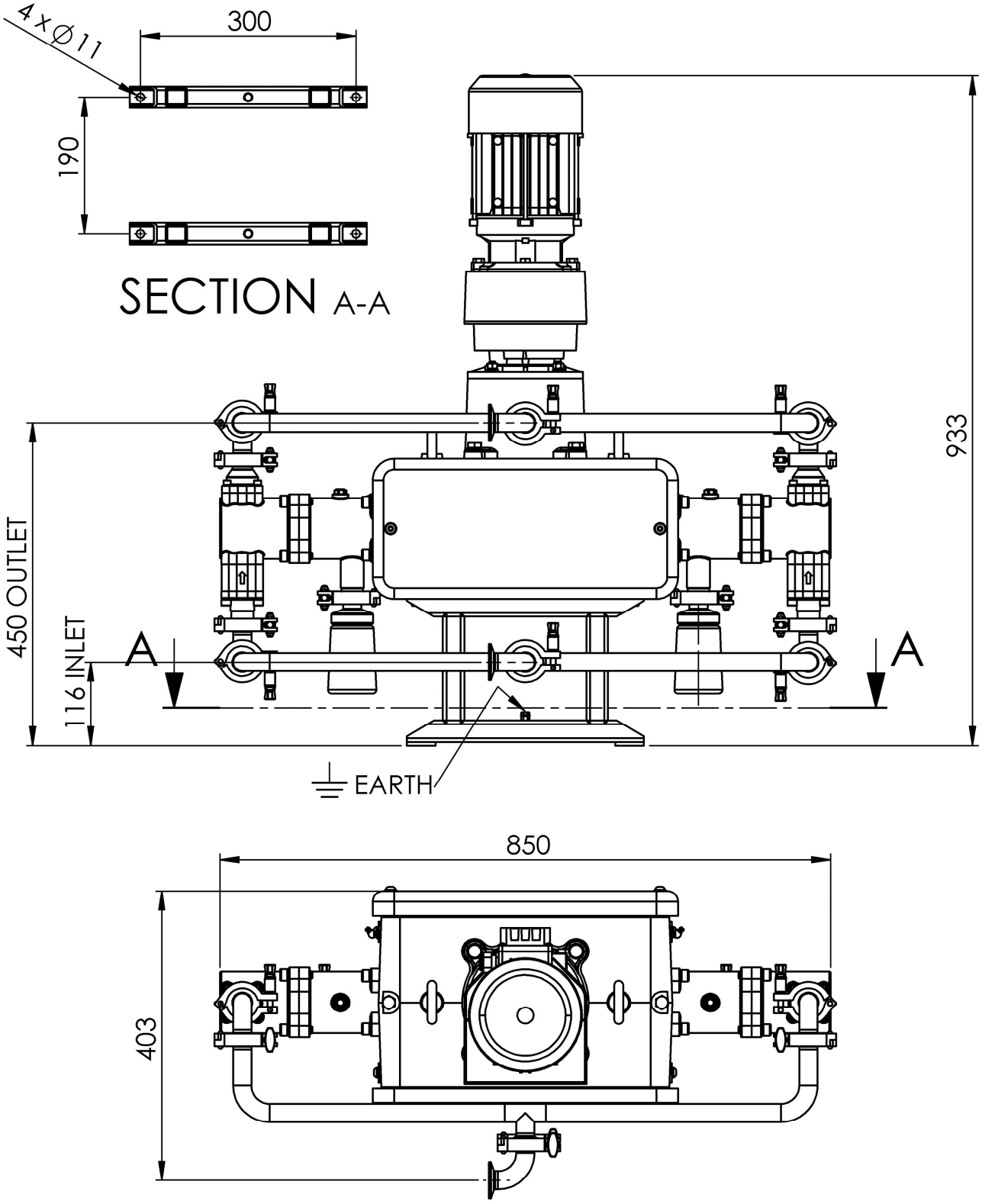
1. Stop the pump (turn off the electric motor); isolate the paint supply and place a suitable container underneath the hose to prevent spillage.
2. Disconnect the outlet hose and position securely into a suitable container.
3. Start the pump and run at slow speed (20Hz) for 1 minute. The pump will now have most of the paint removed; however, some material will remain within the fluid cylinders and manifolds.
4. If required to finally remove any paint from the pump, place the supply hose in a compatible solvent and run the pump until sufficiently clean.

Recommended Spare Parts and Kits for E2-15 AFP Pumps			
Kit No.	**Part No.**	**Description**	**Remarks**
#	192850	Constant Velocity Cam	(72)
#	194105	Ø70 AFP Piston.	(117)
#	192392	Cam Follower Bearing	(89)
#	192871	Linear Bearing	(96)
#	192579	Bellows (fluid section)	(126)
❶	250714	Fluid Section Seal Kit	
❷	250716	Wet section overhaul Kit	
❸	250642	Main Bearing Overhaul Kit	

Check Main Parts List for details of individual Kit Contents

Accessories / Maintenance		
Part No.	**Description**	**Remarks**
192800	Smart Card	V3.0
502371	Local Isolation Box	
502483	Electrical Panel for Single Pump Operation	Inc Smart Card
502144	Pressure Switch	
194495	Sensor Manifold	
192547	Pressure Sensor (4-20 mA / 0-25 Bar)	Pressure feedback
502373	Grease Gun for Cam Follower (& Main Bearings)	Collet Connector
502375	Grease for Cam Follower (& Main Bearings)	
192206	1” Sanitary Gasket	
192009	1” Sanitary Clamp	
PRV22-U-10	Pressure Relief Valve – 22 Bar	¾” BSP/NPS Outlet
PRV22-S-10	Pressure Relief Valve – 22 Bar	1” Sanitary Outlet
PRV22-N-10	Pressure Relief Valve – 22 Bar	¾” NPT (f) Outlet

Special Assembly Tools Required		
Part No.	**Description of Use**	**Remarks**
192450	M8 Torx Security Screwdriver for Cover	FOC with a New Pump
193119	Top Bearing Locknut Tool	
193120	Bottom Bearing Locknut Tool	
193121	Top Bearing Press Tool	
193122	Bottom Bearing Press Tool	
502785	Bellows Assembly Tool	


4 x Ø11
300
190
SECTION A-A
933
450 OUTLET
116 INLET
A
A
EARTH
850
403

WARRANTY POLICY

Binks products are covered by Carlisle Fluid Technologies five year materials and workmanship limited warranty. The use of any parts or accessories, from a source other than Carlisle Fluid Technologies, will void all warranties. For specific warranty information please contact the closest Carlisle Fluid Technologies location listed below.

Carlisle Fluid Technologies reserves the right to modify equipment specifications without prior notice. DeVilbiss®, Ransburg®, MS®, BGK® and Binks® are registered trademarks of Carlisle Fluid Technologies, Inc.

Binks is part of Carlisle Fluid Technologies, a global leader in innovative finishing technologies. For technical assistance or to locate an authorized distributer, contact one of our international sales and customer support locations below.

USA/Canada
www.binks.com
info@carlisleft.com
Toll Free Tel: 1-800-992-4657
Toll Free Fax: 1-888-246-5732

Mexico
www.carlisleft.com.mx
ventas@carlisleft.com.mx
Tel: 011 52 55 5321 2300
Fax: 011 52 55 5310 4790

Brazil
www.devilbiss.com.br
vendas@carlisleft.com.br
Tel: +55 11 5641 2776
Fax: +55 11 5641 1256

United Kingdom
www.carlisleft.eu
info@carlisleft.eu
Tel: +44 (0)1202 571 111
Fax: +44 (0)1202 573 488

France
www.carlisleft.eu
info@carlisleft.eu
Tel: +33(0)475 75 27 00
Fax: +33(0)475 75 27 59

Germany
www.carlisleft.eu
info@carlisleft.eu
Tel: +49 (0) 6074 403 1
Fax: +49 (0) 6074 403 281

China
www.carlisleft.com.cn
mkt@carlisleft.com.cn
Tel: +8621-3373 0108
Fax: +8621-3373 0308

Japan
www.ransburg.co.jp
overseas-sales@carlisleft.co.jp
Tel: 081 45 785 6421
Fax: 081 45 785 6517

Australia
www.carlisleft.com.au
sales@carlisleft.com.au
Tel: +61 (0) 2 8525 7555
Fax: +61 (0) 2 8525 7575