

FORM NO. TD-106-2 REV-4

PRODUCT STANDARD

PULVERIZERS

HYDERABAD

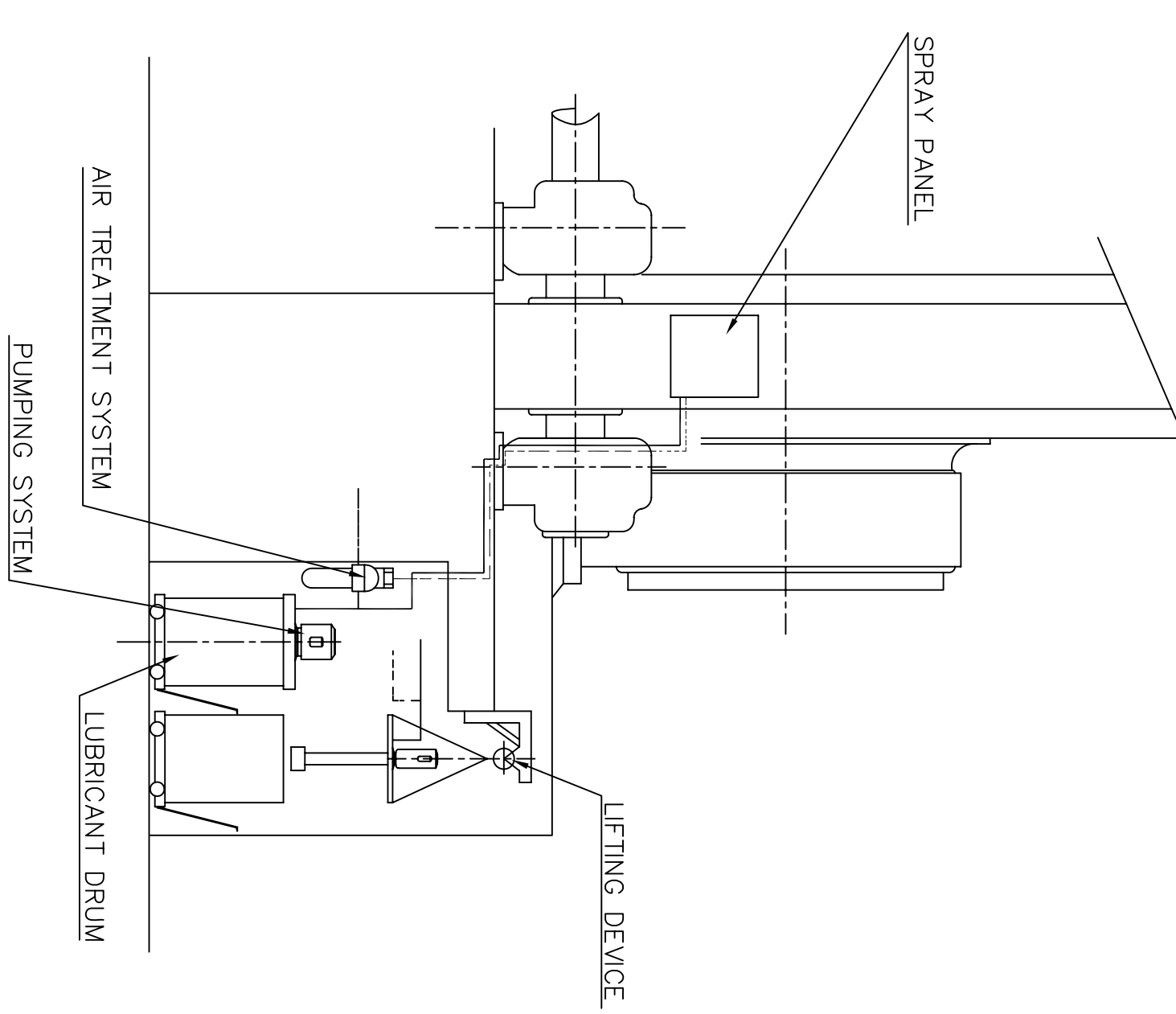
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APPENDIX-E

TYPICAL GIRTH GEAR LUBRICATION SYSTEM



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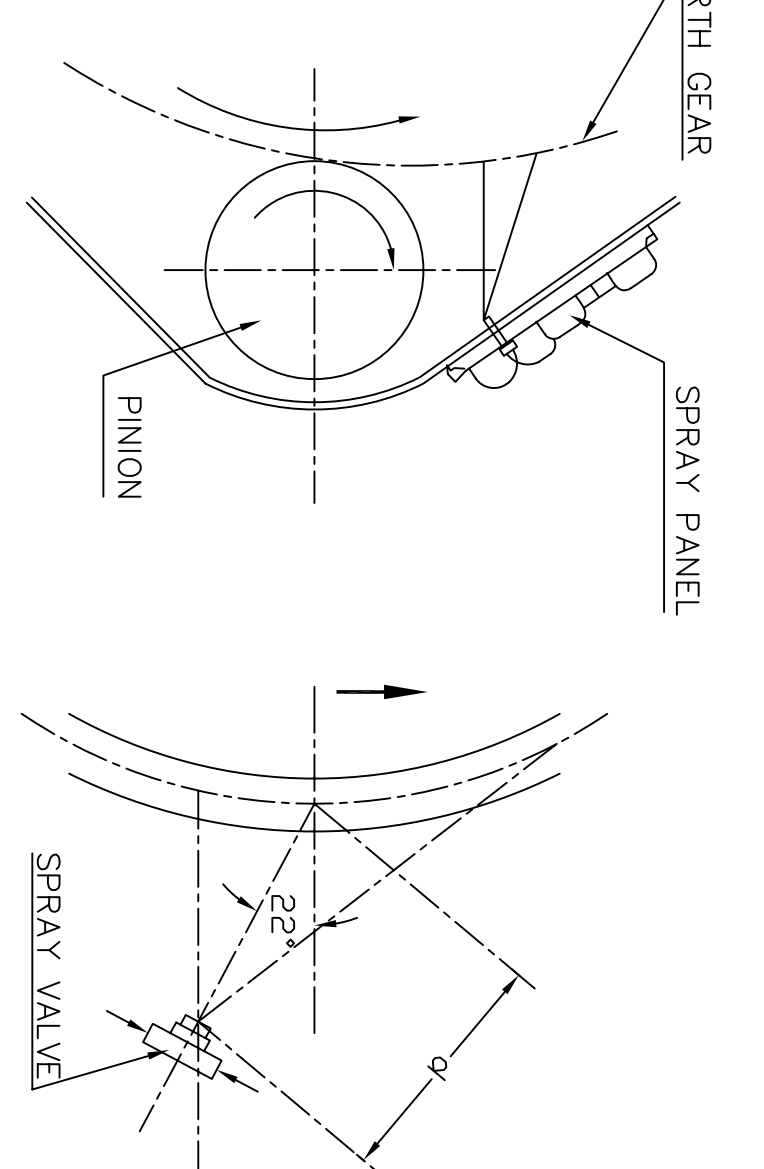
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APPENDIX-F

LAY OUT DIAGRAM OF SPRAY PANEL



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APPENDIX-G

RECORD OF REVISIONS

REV. No.	DATE	REVISION DETAILS	REVISED	APPROVED
01	13.12.94	VOLAGES INCLUDED	T.M.R	J.G.K
02	18.5.99	4 NOZZLE SPRAY SYSTEM FOR BBD-3448 MILL-ADDED	K.V.R	T.M.R
03	29.10.01	FOR SOLENOID AC OUT PUT VALVE VAR TABLE ADDED	T.M.R	J.G.K
04	09.07.07	WARRANTING & ADDITIONAL INSPECTION NOTES ADDED AND SPRAY PANEL DIMENSIONS SHOWN	N.D.S	T.M.R

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APPENDIX-A

LUBRICATION SYSTEM FOR GIRTH GEAR AND PINION

DATA SHEET	REV.	BY	DATE
	00		

MILL TYPE:

10. SITE

11. TEMPERATURE MIN. AVERAGE:

12. ATMOSPHERE (MOISTURE- STEAM -DUST-CHEMICAL)

20. GENERALITIES

21. GIRTH GEAR WIDTH:

22. NUMBER OF SPRAY VALVES:

23. VERSUS WITH ELECTRICAL PUMP PNEUMATIC PUMP:

30. GREASE

31. QUALITY

32. CONSUMPTION RUNNING IN PERIOD: NORMAL PERIOD:

40. SERVICE AIR

41. AIR FLOW FOR SPRAY VALVES: FOR PNEUMATIC PUMP (1)

42. AIR PRESSURE ON SPRAY VALVES

50. COMPLEMENTARY INFORMATION

(1) FOR SYSTEM WITH PNEUMATIC PUMP

LE 22-41-42 ARE TO BE COMPLETED BY THE SUPPLIER

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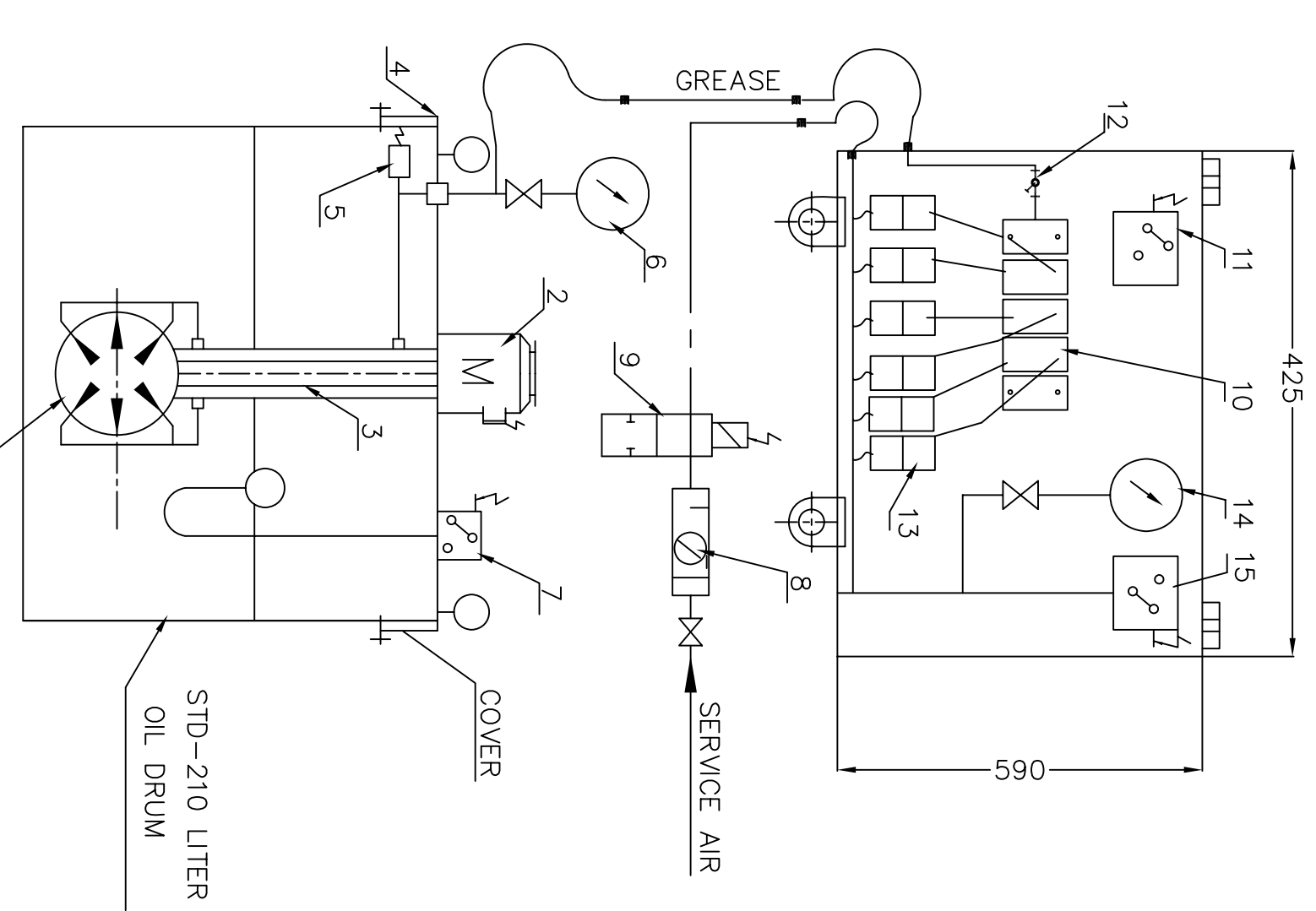
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APPENDIX-B

TYPICAL LUBRICATION DIAGRAM FOR GIRTH GEAR WITH ELECTRICAL PUMP



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APPENDIX-C

LUBRICATION OF THE PINION-WHEEL ASSEMBLY WITH ELECTRIC PUMP

MARK	QUANTITY	DESIGNATION	OBSERVATIONS
1	1	ELECTRIC CONTROL PUMP	PRESSURE: 10 MPa
2	1	ELECTRIC MOTOR 0.55 KW/1500RPM	
3	1	MECHANICAL AND HYDRAULIC COVER FOR OPEN DRUM	PROVIDED WITH 3 LIFTING RINGS FOR PUMP PROTECTION
4	1	SAFETY VALVE	FOR PUMP PROTECTION
5	1	PRESSURE GAUGE WITH 1/4TURN SHUT OFF VALVE	FOR PUMP PROTECTION
6	1	ELECTRIC LEVEL CONTROLLER	FOR PUMP PROTECTION
7	1	AIR TREATMENT SYSTEM	FOR PUMP PROTECTION
8	1	PRESSURE REDUCER LUBRICATING FILTER WITH SHUTOFF VALVE	FOR PUMP PROTECTION
9	1	SUPPLY SOLENOID VALVE	FOR PUMP PROTECTION
10	1	SPRAY PANEL	FOR PUMP PROTECTION
11	1	DISTRIBUTOR BLOCK (N OUTLETS)	FOR PUMP PROTECTION
12	1	CONTROL EQUIPMENT ON THE DISTRIBUTOR	FOR PUMP PROTECTION
13	n	FILTER-STRAINER	FOR PUMP PROTECTION
14	1	PRESSURE GAUGE EQUIPPED WITH A 1/4 TURN SHUT-OFF VALVE	FOR PUMP PROTECTION
15	1	PRESSURE SWITCH	FOR PUMP PROTECTION

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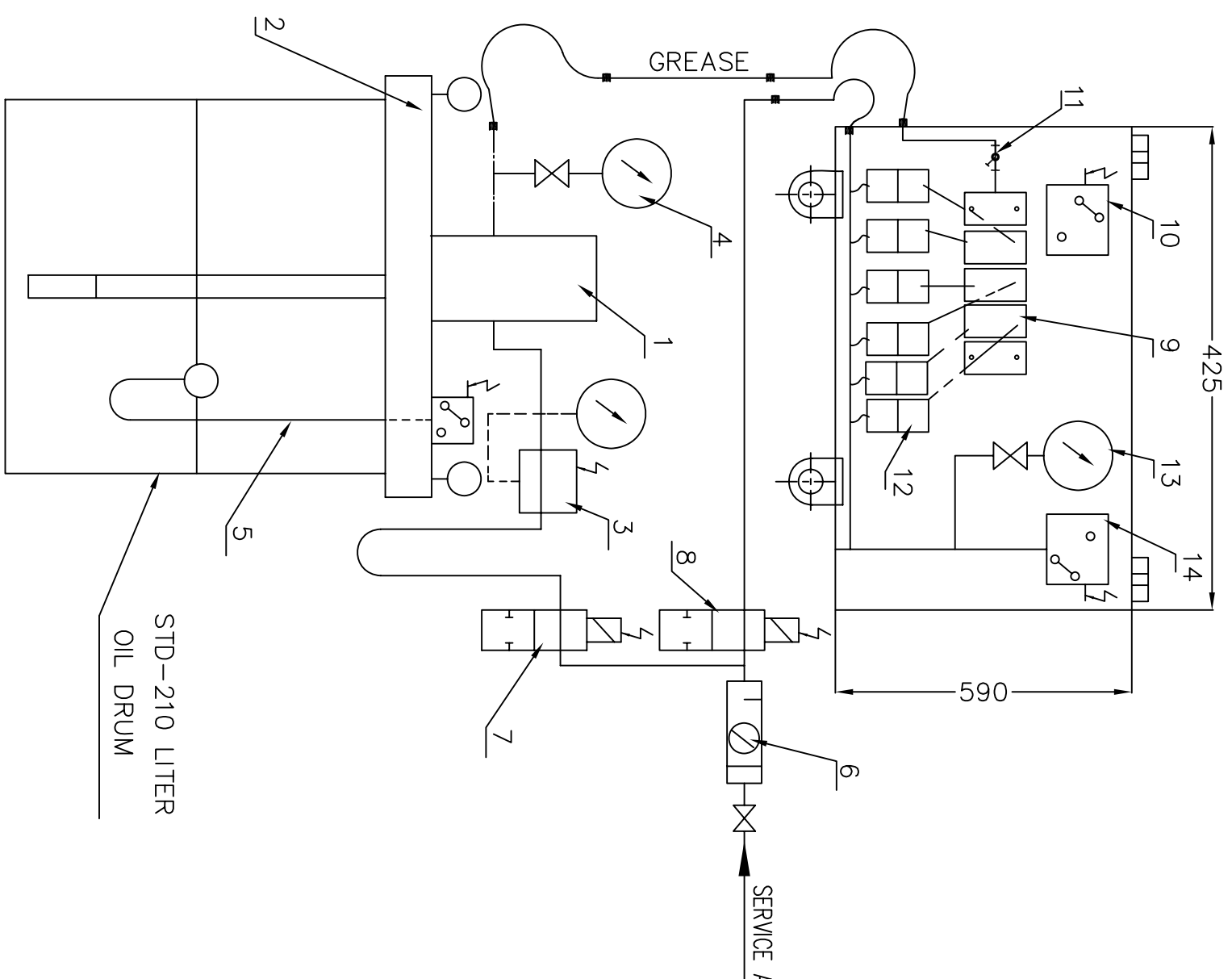
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APPENDIX-D

TYPICAL LUBRICATION DIAGRAM FOR GIRTH GEAR ALTERNATIVE WITH PNEUMATIC PUMP



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APPENDIX-E

LUBRICATION OF THE PINION-WHEEL ASSEMBLY WITH PNEUMATIC PUMP

MARK	QUANTITY	DESIGNATION	OBSERVATIONS
1	1	PNEUMATIC CONTROL PUMP	RATIO-45/1
2	1	COVER FOR OPEN DRUM	PROVIDED WITH 3 LIFTING RINGS
3	1	AIR PRESSURE REDUCER	ADJUSTING RANGE 0-12 MPa
4	1	PRESSURE GAUGE EQUIPPED WITH 0 1/4 TURN SHUTOFF VALVE	BOX DIA 100mm FILLED WITH OIL
5	1	ELECTRIC LEVEL CONTROLLER	FOR PUMP PROTECTION
6	1	AIR TREATMENT SYSTEM	FOR PUMP PROTECTION
7	1	PRESSURE REDUCER LUBRICATING FILTER WITH SHUTOFF VALVE	FOR PUMP PROTECTION
8	1	SOLENOID VALVES	FOR PUMP PROTECTION
9	1	SPRAY PANEL	FOR PUMP PROTECTION
10	1	DISTRIBUTOR BLOCK (N OUTLET)	FOR PUMP PROTECTION
11	1	CONTROL EQUIPMENT ON THE DISTRIBUTOR	FOR PUMP PROTECTION
12	0	FILTER-STRAINER	FOR PUMP PROTECTION
13	1	PRESSURE GAUGE EQUIPPED WITH A 1/4 TURN SHUT-OFF VALVE	FOR PUMP PROTECTION
14	1	PRESSURE SWITCH	FOR PUMP PROTECTION

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APPENDIX-F

LUBRICATION OF THE PINION-WHEEL ASSEMBLY WITH PNEUMATIC PUMP

MARK	QUANTITY	DESIGNATION	OBSERVATIONS
1	1	PNEUMATIC CONTROL PUMP	RATIO-45/1
2	1	COVER FOR OPEN DRUM	PROVIDED WITH 3 LIFTING RINGS
3	1	AIR PRESSURE REDUCER	ADJUSTING RANGE 0-12 MPa
4	1	PRESSURE GAUGE EQUIPPED WITH 0 1/4 TURN SHUTOFF VALVE	BOX DIA 100 mm FILLED WITH OIL
5	1	ELECTRIC LEVEL CONTROLLER	FOR PUMP PROTECTION
6	1	AIR TREATMENT SYSTEM	FOR PUMP PROTECTION
7	1	PRESSURE REDUCER LUBRICATING FILTER WITH SHUTOFF VALVE	FOR PUMP PROTECTION
8	1	SOLENOID VALVES	FOR PUMP PROTECTION
9	1	SPRAY PANEL	FOR PUMP PROTECTION
10	1	DISTRIBUTOR BLOCK (N OUTLET)	FOR PUMP PROTECTION
11	1	CONTROL EQUIPMENT ON THE DISTRIBUTOR	FOR PUMP PROTECTION
12	0	FILTER-STRAINER	FOR PUMP PROTECTION
13	1	PRESSURE GAUGE EQUIPPED WITH A 1/4 TURN SHUT-OFF VALVE	FOR PUMP PROTECTION
14	1	PRESSURE SWITCH	FOR PUMP PROTECTION

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APPENDIX-G

LUBRICATION OF THE PINION-WHEEL ASSEMBLY WITH PNEUMATIC PUMP

MARK	QUANTITY	DESIGNATION	OBSERVATIONS
1	1	PNEUMATIC CONTROL PUMP	RATIO-45/1
2	1	COVER FOR OPEN DRUM	PROVIDED WITH 3 LIFTING RINGS
3	1	AIR PRESSURE REDUCER	ADJUSTING RANGE 0-12 MPa
4	1	PRESSURE GAUGE EQUIPPED WITH 0 1/4 TURN SHUTOFF VALVE	BOX DIA 100 mm FILLED WITH OIL
5	1	ELECTRIC LEVEL CONTROLLER	FOR PUMP PROTECTION
6	1	AIR TREATMENT SYSTEM	FOR PUMP PROTECTION
7	1	PRESSURE REDUCER LUBRICATING FILTER WITH SHUTOFF VALVE	FOR PUMP PROTECTION
8	1	SOLENOID VALVES	FOR PUMP PROTECTION
9	1	SPRAY PANEL	FOR PUMP PROTECTION
10	1	DISTRIBUTOR BLOCK (N OUTLET)	FOR PUMP PROTECTION
11	1	CONTROL EQUIPMENT ON THE DISTRIBUTOR	FOR PUMP PROTECTION
12	0	FILTER-STRAINER	FOR PUMP PROTECTION
13	1	PRESSURE GAUGE EQUIPPED WITH A 1/4 TURN SHUT-OFF VALVE	FOR PUMP PROTECTION
14	1	PRESSURE SWITCH	FOR PUMP PROTECTION

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APPENDIX-H

SPECIFICATION FOR GIRTH GEAR GREASING SYSTEM

1. PURPOSE:

These rules group the requirements and recommendations concerning the selection and purchase of an automatic grease spray type lubrication system for girth gear-pinion set used in ball tube mills.

The supply shall constitute a complete assembly in working order and ready for installation and connection.

2. DESCRIPTION OF THE LUBRICATION SYSTEM

It consists of the following sub-assemblies:

- 1 lubricant drum which acts as tank,
- 1 pumping station
- 1 compressed air treatment system
- 1 spray panel
- 1 set of rigid and flexible pipes which connect the above sub-assemblies.
- 1 set of control instruments with electric box

3. ENVIRONMENT:

Dusty atmosphere.

Presence of vibrations.

Lubricant : Moli-Molke

Reference : Moli-Molke c or similar

4. SUB-ASSEMBLIES OF THE LUBRICATION SYSTEM

4.1- DUMPING SYSTEM

pumping can be carried out by an electric pump, it must be adaptable to the lubricant drum, (std oil drum-210 lit)

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APPENDIX-I

4.3.1

SPRAY VALVES

SPRAY VALVES POSITION IS INDICATED IN SKETCH OF APPENDIX G. THE SPRAY VALVES NUMBER DEPENDS ON THE WIDTH OF THE GIRTH GEAR. IT IS USUALLY PROVIDED ONE SPRAY VALVE FOR LUBRICATING A GIRTH GEAR WITH OF 80 TO 100 mm

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APPENDIX-J

4.3.2

DISTRIBUTION BLOCK

IT SUPPLIES THE SPRAY VALVES WITH THE QUANTITIES OF PROPORTIONED GREASE. THE GREASE FLOWS THROUGH THE DISTRIBUTOR BLOCK AND IS GENERATED BY THE FLOW OF GREASE DISCHARGED BY THE PUMP. THE POSITION OF ONE OF THE ELEMENTS OF THE DISTRIBUTOR INCLUDES AN INDEX WHICH ACTS ON AN ELECTRIC CONTACT. ACTING ON THIS CONTACT, PERMITS DETERMINING THE QUANTITY OF GREASE FED WITHIN A GIVEN TIME, TRIPPING TIMERS. 4.3.3 SYSTEM WITH ELECTRIC PUMP. 2. ADJUSTABLE TIMERS ENSURE GREASE DELIVERY TO THE SPRAY VALVES THROUGH THE DISTRIBUTION -GREASE ATOMIZING ON THE TEETH THROUGH COMPRESSED AIR INJECTION. THE FIRST TIMER CONTROLS THE DURATION OF ATOMIZATION (ADJUSTABLE FROM 0 TO 10s) BY OPENING THE SOLENOID VALVE MARK B. SKETCH APPENDIX B AND IS ACTUATED BY SWITCHING THE ELECTRIC CONTACT MENTIONED IN 4.3.2. THE OTHER TIMER CONTROLS THE TIME SPENT BETWEEN TWO ATOMIZATIONS (ADJUSTABLE FROM 0 TO 2 mm) . TYPES A "LUBRICATION DEFECT" ALARM IF THE TIME LAGGED IS LONGER THAN THE ADJUSTED TIME. THIS TIMER MUST BE RESET AT EACH SWITCHING OF THE ELECTRIC CONTACT. 4.4 CONTROL INSTRUMENTS AND ELECTRIC BOX 4.4.1 CONTROL INSTRUMENTS The instruments (alarm thresholds, valve opening) shall be stop-adjusted except for the timers and the impulses meter whose setting values are determined at the site. All instruments are provided with tight box, protection level IP655 and topological contacts, if necessary. 4.4.2 ELECTRIC BOX The protection of this box is at least IP 55. IT GROUPS THE TERMINAL BOXES, TIMERS, METERS RELAYS.

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APPENDIX-K

5.1

PUMPING SYSTEM

PUMPING IS CARRIED OUT BY A PNEUMATIC PUMP. IT MUST BE ADAPTABLE TO LUBRICANT DRUM. SUPPLY A LIFTING SYSTEM FOR REPLACING THE DRUM (SEE SKETCH IN APPENDIX F.) AN ELECTRICAL LEVEL CONTROLLER TRIPS AN ALARM IN CASE OF LOW LEVEL. THE GREASE FLOWS WHICH ARE NECESSARY FOR RUNNING IN AND NORMAL OPERATION PERIODS ARE INDICATED IN APPENDIX A. PNEUMATIC PUMP DOES NOT PERMIT SUFFICIENTLY FINE PROPORTIONING OF GREASE, IN ORDER TO MEET THE DAILY QUANTITIES USED. THEREFORE, THE LUBRICATING CYCLE MUST BE PERIODICALLY INTERRUPTED (FOR A MAXIMUM OF 10 MINUTES). 5.2 AIR TREATMENT SYSTEM IT IS USED FOR ATOMIZING THE GREASE ON THE TEETH AND DRIVING THE PNEUMATIC PUMP. POSITION OF ONE OF THE ELEMENTS OF THE DISTRIBUTOR INCLUDES AN INDEX WHICH ACTS ON THE ELECTRIC CONTACT. ACTING ON THIS CONTACT, THE IMPULSE METER IS ACTUATED. 5.3 CONTROL EQUIPMENT ON THE DISTRIBUTOR 5.4 SYSTEM WITH PNEUMATIC PUMP 5.5 ADJUSTABLE TIMERS AND AN IMPULSE METER ENSURE GREASE DELIVERY TO THE SPRAY VALVES THROUGH THE DISTRIBUTION GROUP -GREASE ATOMIZING ON THE TEETH THROUGH COMPRESSED AIR INJECTION -PERIODICALLY STOP THE OPERATION OF THE PUMP. THE FIRST TIMER PERIODICALLY (PERIOD ADJUSTABLE FROM 0 TO 10 mm) CAUSE PUMP STARTING AND AIR FEEDING TO THE SPRAY VALVES (OPENING OF SOLENOID VALVES MARK 7 AND 8, SKETCH APPENDIX D.)

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APPENDIX-L

6.1

DATA TO BE GIVEN ALONG WITH OFFER

Dimensional drawing of lub oil system should be submitted. Instrumentation on lubrication pump and motor. Details about lubrication system, lubrication schemes, and details about instrumentation, quality plan and test procedures. 6.2 Reference list of lubrication system supplied earlier, with performance details. 6.3 Guarantee certificates. 6.4 Following documents shall be supplied with in 4 months from the placement or purchase order. 6.5 A. O&M Manual – Twenty copies. B. General arrangement drawing of lubrication and inspection. – The following inspection shall be performed on each grease spraying system. a) Over all Dimensions of each spray panel & pump assembly. b) The list of items and rating. c) As per approved Quality Plan and Drawings.