




TD-106-1 Rev No. 5 Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD		Product STD NO.	BA50051
				Rev No 06	
				Page 1 of 13	
<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; padding: 5px;"> COPYRIGHT AND CONFIDENTIAL The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company. </div> <div style="flex-grow: 1; padding: 10px;"> <p style="text-align: center;"><u>SPECIFICATION FOR GIRTH GREASING SYSTEM</u></p> <p>1. <u>PURPOSE :</u></p> <p>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.</p> <p>The supply shall constitute a complete assembly in working order and ready for installation and connection.</p> <p>2. <u>DESCRIPTION OF THE LUBRICATION</u></p> <p>It consists of the following sub-assemblies:</p> <ul style="list-style-type: none"> — 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 <p>3. <u>ENVIRONMENT:</u></p> <p>.Dusty atmosphere .Presence of vibrations. .Lubricant : Mobil make Reference : Mobiltac c or similar</p> <p>4. <u>SUB-ASSEMBLIES OF THE LUBRICATION STATION</u></p> <p>4.1 - <u>Pumping system</u></p> <p>Pumping can be carried out by an electric pump. It must be acceptable to the lubricant drum (Std oil drum – 210 lit)</p> </div> </div>					
Revisions: Refer to record of revisions:		Prepared: RAZVI	Approved: J.G.KULKARNI	Date: 24.11.01	

TD-106-1 Rev No. 5		Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD	Product STD no.	BA50051
					Rev No.	06
					Page	2 of 13
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TD-106-1 Rev No. 5	Form No.		<p style="text-align: center;">PRODUCT STANDARD PULVERISERS HYDERABAD</p>	Product STD no.	BA50051
				Rev No. 06	
				Page 3	of 13

4.3.2 DISTRIBUTION BLOCK

It supplies the spray valves with the quantities of proportioned lubricants by displacement of its pistons, these displacements are generated by the flow of grease discharged by the pump.

The piston 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 CONTROL EQUIPMENT ON THE DISTRIBUTOR

SYSTEM A WITH ELECTRIC PUMP

.2 adjustable timers ensure:

- Grease delivery to the spray valves through the distribution group.
- 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 8, 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 2mm), trips a “lubrication defect” alarm if the time lapsed 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 shop-adjusted except for the timers and the impulse meter whose setting values are determined at the site.

All instruments are provided with tight box, protection level IP655 and tropicalized contacts, if necessary.

4.4.2 ELECTRIC BOX

The protection of this box is atleast IP 55
It groups the terminal boxes, timers, meters relays.

TD-106-1 Rev No. 5	Form No.		<p style="text-align: center;">PRODUCT STANDARD PULVERISERS HYDERABAD</p>	Product STD no.	BA50051
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					Page 4 of 13

FOR GIRTH GEAR GREASING SYSTEM WITH PNEUMATIC PUMP

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.

5.3 DISTRIBUTING BLOCK


Piston of one of the elements of the distributor includes an index which acts on the electrical contact.

Acting on this contact, the impulse meter is actuated.

CONTROL EQUIPMENT ON THE DISTRIBUTOR

SYSTEM WITH PNEUMATIC PUMP

- .2 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)

TD-106-1 Rev No. 5 Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD	Product STD no.	BA50051
			Rev No.	06
			Page	5 of 13

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The impulse meter controls the number of cycles achieved by the distributor and therefore the grease quantity injected. When the number of impulses displayed is reached, the pump is stopped (closing of solenoid valve mark 7, sketch appendix D)

.The second timer controls stopping of the air injection to spray valves (closing of solenoid valve mark 8, sketch appendix D-3)

It also generates an alarm if the number of impulses displayed has not been reached in the time fixed (adjustable from 0 to 20mm).This timer is reset by the first timer).

6 DATA TO BE GIVEN ALONG WITH OFFER

6.1 Dimensional drawing of lube oil system should be submitted.

6.2 Instrumentation on lubrication system, lubrication schemes, and details about lubrication pump and motor.

6.3 Inspection procedures, detailed quality plan and test procedures.

6.4 Painting and packing details.

6.5 Reference list of lubrication system supplied earlier, with performance certificates.

6.6 Guarantee certificates.

7 Following documents shall be supplied with in 4 months from the placement of purchase order.

A. O&M Manual – Twenty copies

B. General arrangement drawing of lubrication and piping system – 20 copies.


8 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.

VAR NO	DESCRIPTION	MATL. CODE
01	GIRTH GEAR GREASING SYSTEM WITH ELECTRICAL PUMP	BA9750051017
02	GIRTH GEAR GREASING SYSTEM WITH PNEUMATIC PUMP	BA9750051025
03	GIRTH GEAR GREASING SYSTEM WITH ELECTRICAL PUMP – FOR 3448 MILL 3 NOS SPRAY NOZZLES.	BA9750051033
04	GIRTH GEAR GREASING SYSTEM WITH PNEUMATIC PUMP 4NOS SPRAY NOZZLES FOR BBD 3448 TUBE MILL	BA9750051041
05	GIRTH GEAR GREASING SYSTEM SPRAY PANEL FOR BBD 4760/4772 MILLS (ELEC.PUMP).	BA9750051050
06	GREASE PUMP (BBD 4760)4772 TUBE MILL	BA9750051068

TD-106-1 Rev No. 5 Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD	Product STD no.	BA50051
			Rev No.	06
			Page	6 of 13

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APPENDIX-A

DATA SHEET	REV	BY	DATE
	00		

LUBRICATION SYSTEM FOR GIRTH GEAR AND PINION

MILL TYPE:

10. SITE

11.TEMPERATURE MIN: AVERAGE MAX:

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 INFORMATIONS

(1) FOR SYSTEM WITH PNEUMATIC PUMP
 LIE 22-41-42 ARE TO BE COMPLETED BY THE SUPPLIER.



PRODUCT STANDARD PULVERISERS HYDERABAD

Product
STD no.

BA50051

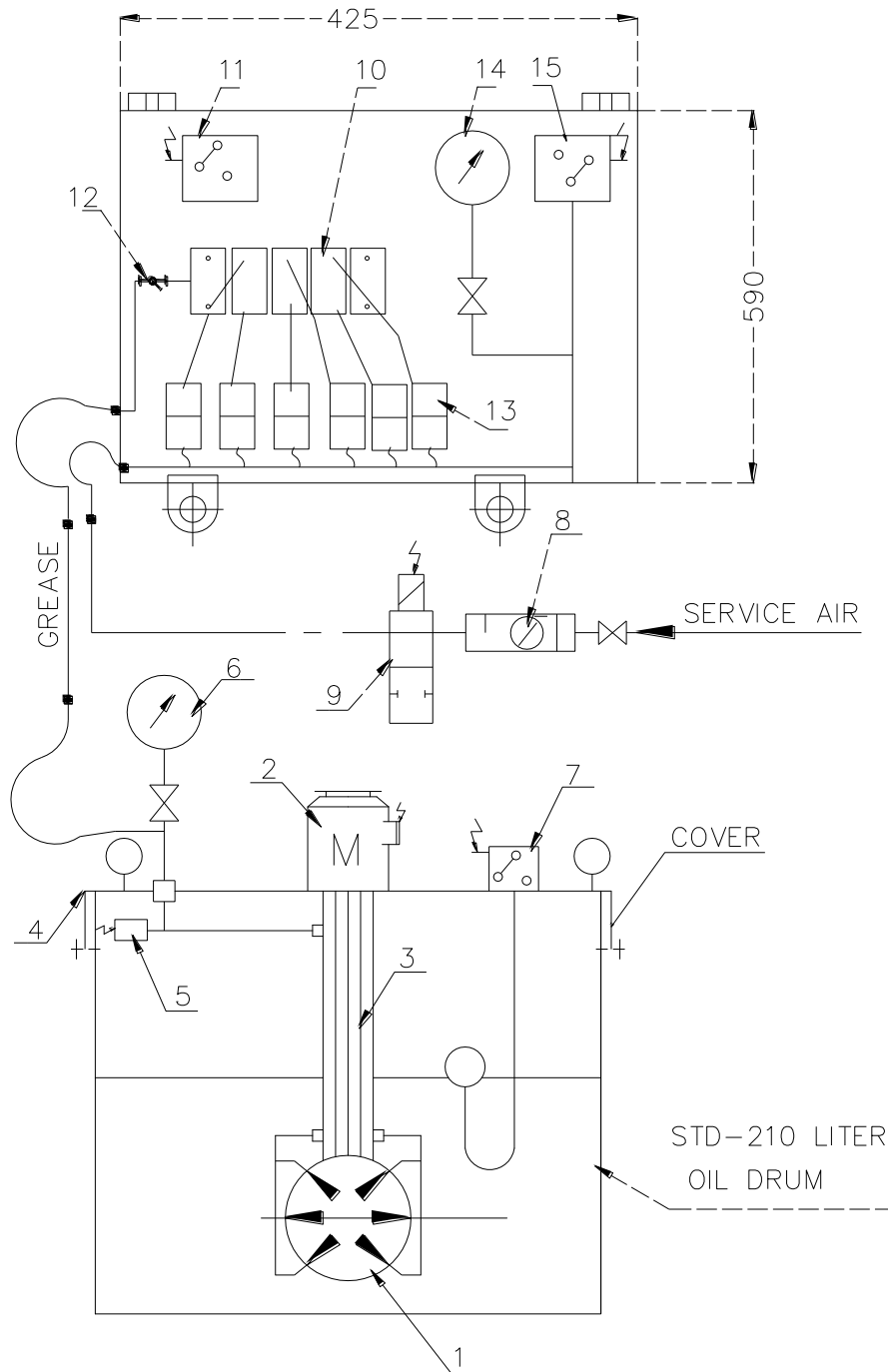
Rev No. 06


Page 7 of 13

APPENDIX-B

TYPICAL LUBRICATION DIAGRAM FOR GIRTH GEAR

WITH ELECTRICAL PUMP



TD-106-1 Rev No. 5 Form No.		PRODUCT STANDARD PULVERISERS HYDERABAD	Product STD no.	BA50051
			Rev No.	06
			Page	8 of 13

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APPENDIX-C

LUBRICATION OF THE PINION-WHEEL ASSEMBLY WITH ELECTRIC PUMP

LIST OF EQUIPMENT

MARK	QUANTITY	DESIGNATION	OBSERVATIONS						
1	1	ELECTRIC CONTROL PUMP	PRESSURE : 10 MPA						
2	1	ELECTRIC MOTOR 0.55 KW,1500RPM 415V,3ø,50HZ.							
3	1	MECHANICAL AND HYDRAULIC CONNECTING DEVICE							
4	1	COVER FOR OPEN DRUM	PROVIDED WITH 3 LIFTING RINGS.						
5	1	SAFTY VALVE	.FOR PUMP PROTECTION .CALIBRATION PRESSURE.:10MPA						
6	1	PRESSURE GAUGE WITH 1/4 TURN SHUT OFF VALVE	BOX DIA 100mm FILLED .WITH GLYCERINE .SCALE 0-16 MPA.						
7	1	ELECTRIC LEVEL CONTROLLER							
<u>AIR TREATMENT SYSTEM</u>									
8	1	PRESSURE REDUCER LUBRICATING FILTER WITH SHUTOFF VALVE	FILTRATION : 50 MICRONS .AUTOMATIC DRAIN						
9	1	SUPPLY SOLENOID VALVE							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">VAR NO</td> <td></td> </tr> <tr> <td>01</td> <td>110 VAC</td> </tr> <tr> <td>02</td> <td>240 VAC</td> </tr> </table>				VAR NO		01	110 VAC	02	240 VAC
VAR NO									
01	110 VAC								
02	240 VAC								
<u>SPRAY PANEL</u>									
10	1	DISTRIBUTOR BLOCK (N OUTLETS)							
11	1	CONTROL EQUIPMENT ON THE DISTRIBUTOR	ACCORDING TO DESCRIPTION chap.4.2.3						
12	1	FILTER - STRAINER	MESH 8 / 10						
13	n	SPRAY VALVES							
14	1	PRESSURE GAUGE EQUIP PED WITH A ¼ TURN SHUT-OFF VALVE	BOX DIA 100 MM FILLED GLYCERIN SCALE 0-1 MPA.						
15	1	PRESSURE SWITCH	ADJUSTING RANGE 0-1 MPA						



PRODUCT STANDARD

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HYDERABAD

Product
STD no.

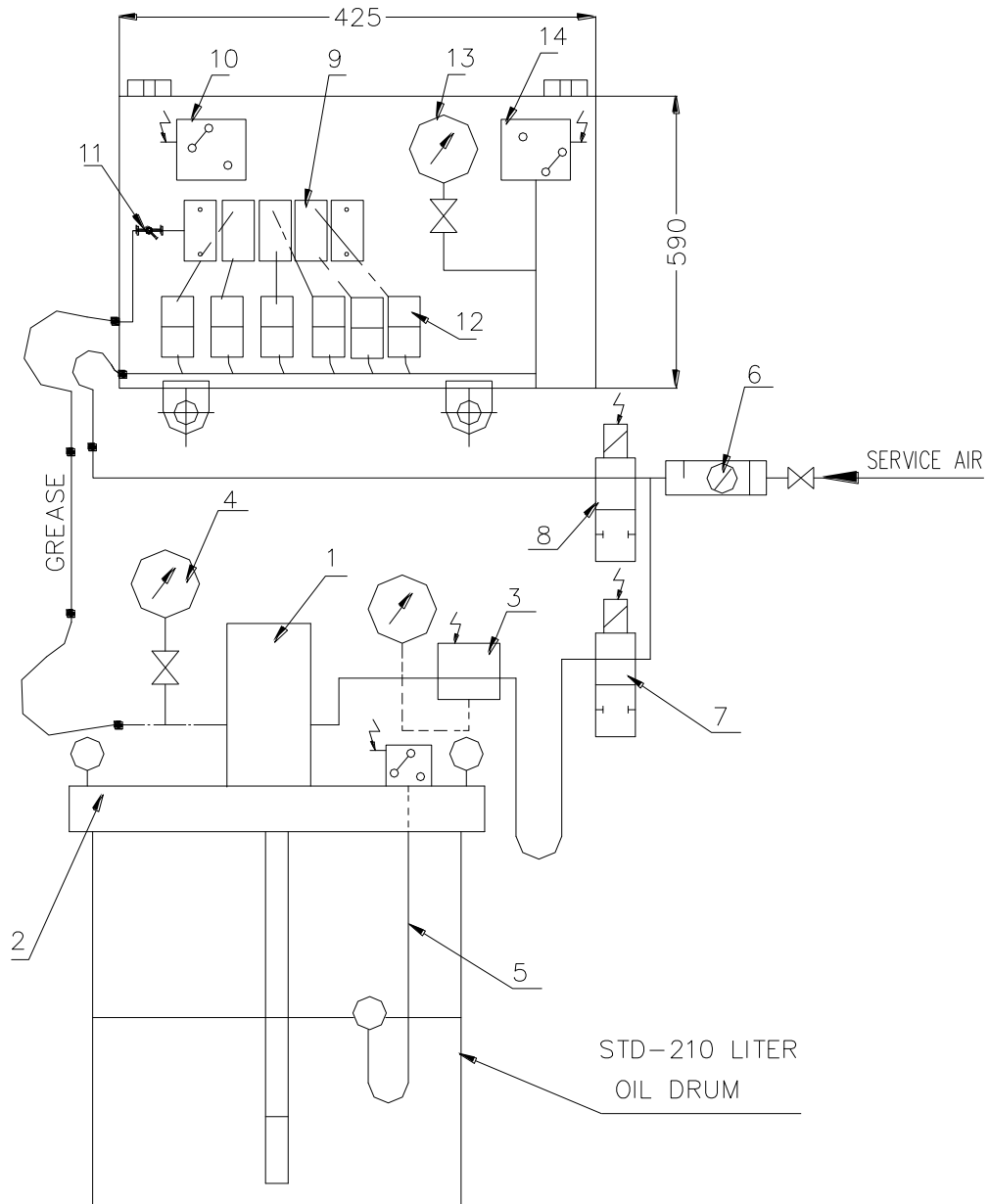
BA50051

Rev No. 06

Page 9 of 13

APPENDIX-D

TYPICAL LUBRICATION DIAGRAM FOR GIRTH GEAR ALTERNATIVE WITH PNEUMATIC PUMP



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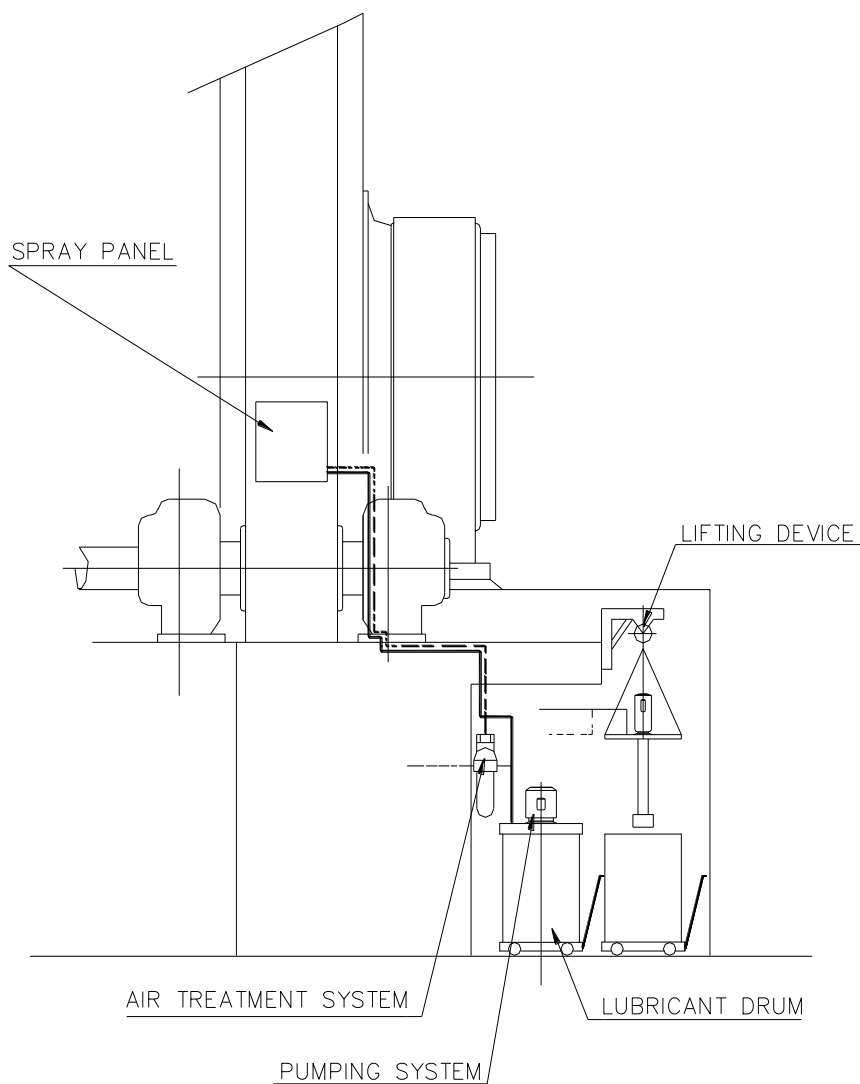
BA50051

Rev No. 06

Page 11 of 13


APPENDIX-F

TYPICAL GIRTH GEAR LUBRICATION SYSTEM



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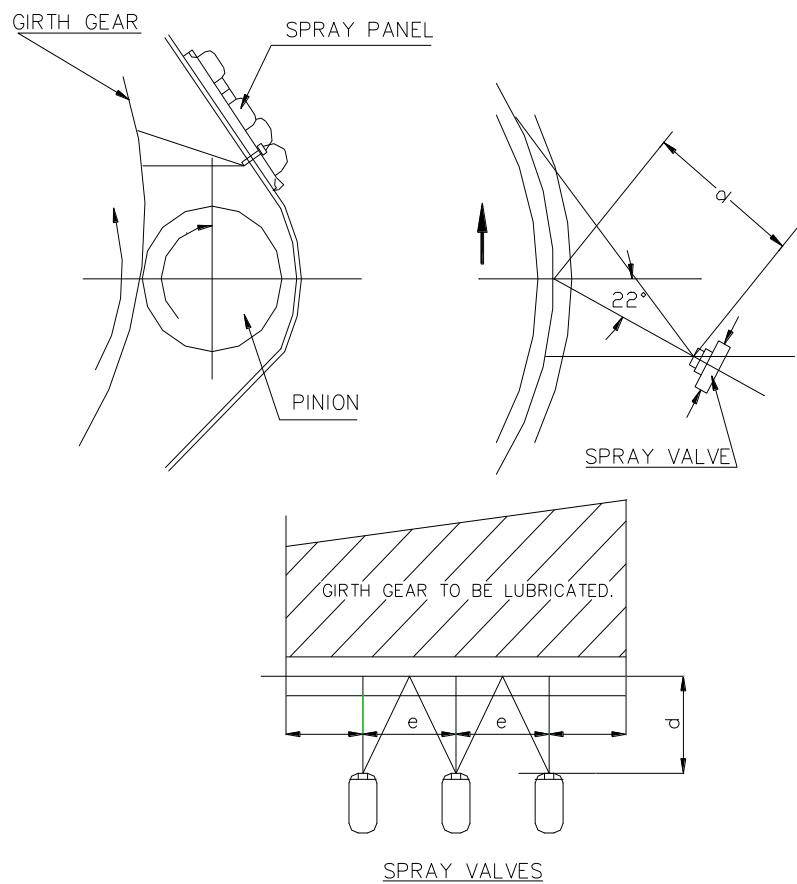
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				Rev No. 06	
				Page 12	of 13

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APPENDIX-F

LAYOUT DIAGRAM OF SPRAY PANEL



d-e The value depends on the spray valve conception. It will be determined by experiments as typical value e: 150 mm.

