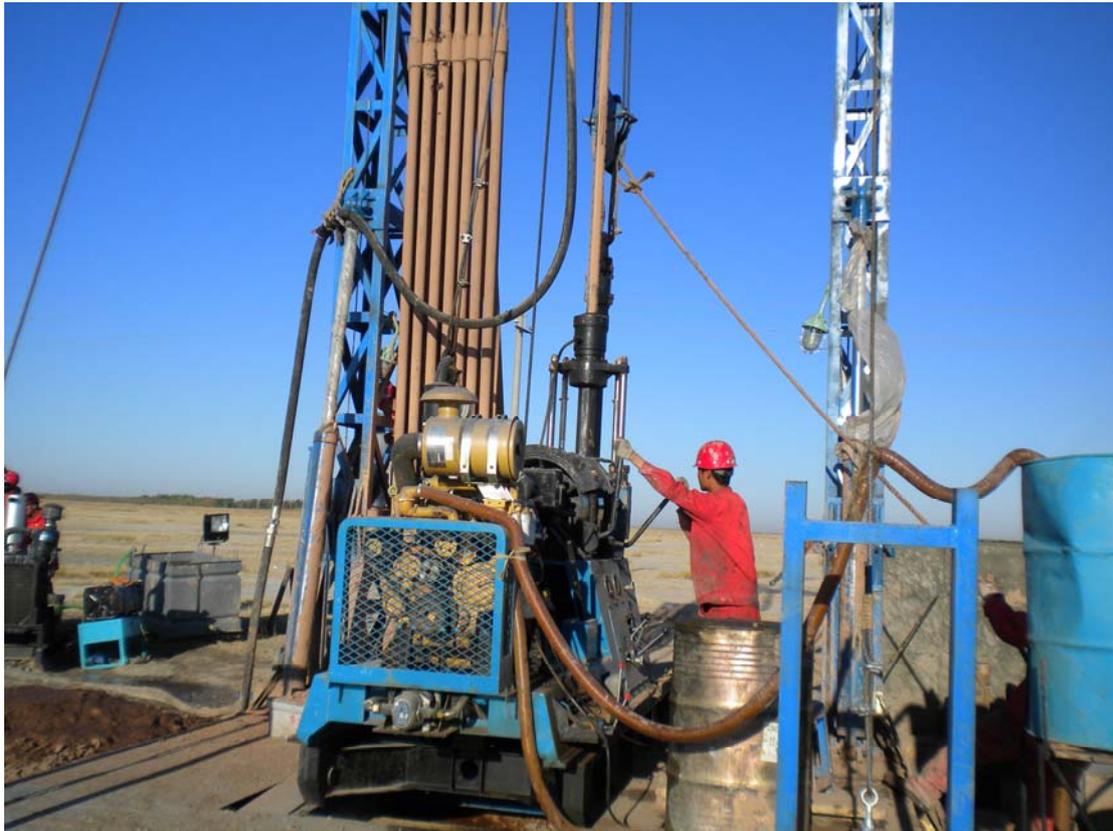


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## GY-300A Drill Rig



### **Description:**

GY-300A drill rig is a shallow/middle-hole core drill. This drill rig is applicable to not only the core drilling of small or big diameter with carbide and diamond bits, but also the engineering geological exploration and the construction engineering, hydropower engineering, highway/railway construction, port construction, etc. The outline is shown in Drawing 1.



### **Features of this Drill Rig:**

1. Rotation speeds of the drill rig are in a wide range (eight gears) and the speed distribution is rational;
2. Geological Exploration Drill Rig GY-300A is characterized by low rotation speed and big torque and wide applicable range. It can be applicable to the low-speed big-diameter drilling besides the rapid-speed drilling;
3. This drill rig is of two-gear reverse speeds, with lower labor intensity and safe operation when dealing with the in-hole accident;
4. It has a large installed power and it is adapted to diesel engine or electric motor;
5. This Geological Exploration Drill Rig features in advanced structure, rational layout, flexible and reliable operation, and is easy for repair and maintenance;
6. The drill rig is small in volume, light in weight, and easy to be disassembled and moved;
7. Feeding travel of the vertical shaft is 600mm, which benefits raising the drilling efficiency and reducing the possibility of drill pipe sticking;
8. Stable for moving, simple and reliable for fixing of drill rig, good stability for high-speed drilling, and a big distance between drill and hole;
9. Drillometer uses the oil-filling and anti-shock structure, with simple scale value, accurate indication and long service life.
10. The hydraulic plunger chuck is adopted, with reliable clamping operation and free from damaging the driving drill pipe;



**Parameters**

S.N.	Item	Parameters			
1	Bore Diameter	93mm	150mm	200mm	300mm
	Drilling depth	350m	280m	220m	120m

2	Rotator	Rotation speed of vertical shaft	
		Clockwise rotation:	58, 101, 160, 221, 234, 406, 640, 885 r/min
		Counterclockwise rotation:	46, 183 r/min
		Max. torque:	3000 N*m
		Feeding travel of vertical shaft:	600 mm
		Max. uplifting force of vertical shaft:	60 kN
		Unit uplifting force:	7.7 kN /Mpa
		Max. feeding force of vertical shaft:	45 kN
		Unit feeding force:	5.7 kN /Mpa
3	Hoist	Diameter of drum:	200 mm
		Diameter of wire rope:	14 mm
		Drum capacity (five layers):	45 m
		Hoisting velocity (third layer):	0.45, 0.785, 1.24, 1.71 m/s
		Max. hoisting force (single rope) :	30 kN
4	Movable travel of drill:	460 mm	
5	Distance between drill and hole-opening:	260 mm	
6	Oil gear pump	Model:	CB-E25
		Nominal displacement:	25 mL/r
		Nominal speed:	1500 r/min
		Rated pressure:	16 Mpa
		Max. pressure:	20 Mpa
7	Power machine		
		Diesel engine	Electric motor
	Model	4L68	Y180L-4
	Rated power	24 kW	22 kW
	Rated speed	1500 r/min	1470 r/min
8	Drill dimension (L ×W ×H)	2510×950×1820 mm	
9	Net weight (excluding the power machine)	1300kg	

#### IV. Basic Structure and Operating System

##### (I) Mechanical Transmission System

##### 1. Frame (Drawing 4)

The frame of the drill rig consists of underframe, upper frame, oil tank, moving oil cylinder (drawing 5) as well as hold-down plate, iron stopper (locking device), etc. The oil tank is mounted with the upper frame. The upper frame and underframe realize the forth/back moving through the oil cylinder. During the normal drilling, the lock bolts at two sides of the front frame are used to clamp or fix the upper sliding parts of the drill rig onto the drill base through the hold-down plate and iron stopper. During the detaching the drill tools, it is necessary to loosen the lock bolts before moving the frame backward.

## 2. Clutch (Drawing 6)

The drill rig uses a typical dry twin disc spring-loaded & constantly-closed friction clutch, which is disengaged or engaged by operating the clutch handle. The handle is mounted in the positioning plate. When moving the handle upward, it is the “disengaged situation” of the clutch and the action to transmission case is cut off; when putting the handle downward, it is the “engaged situation” and the action is transmitted to the transmission case.

Adjustment of clutch: when the clutch is engaged, between the ends of the three release levers and release bearings there should be a gap of 0.3-0.5mm. If there is no such a gap, the release bearings will be pressed on the release levers constantly, the clutch is not fully released, the friction plate would be worn out quickly, so would the release levers and bearings. But the gap should not be too big either, otherwise the free travel will be too long, which would cause clutch releasing not in time or even not fully released. Adjusting method:

- a. Push the clutch control handle to “Engaged”.
- b. Unscrew the locking nut on the release lever, then unscrew the adjusting nut by using a spanner, and measure the gap between the release lever and bearing with a thickness gauge, until the gap reads 0.3-0.5mm. Repeat it for the three release levers, their gaps should be the same, after that screw up the locking nuts, and check it again to make sure.

The clutch handle shall be turned to the “engaged” position if the drill rig will not be used for a long time.

## 3. Transmission Case

The drill rig uses a typical four-gear transmission mechanism (four gears’ clockwise rotation and one gear reverse); it adopts a concentrated gear-shifting handle. The operator can operate the shifting lever to its corresponding position to choose the speed-changing gear as per working need.

## 4. Transfer Box (Drawing 8)

The transfer box is in fact a two-speed transmission case. The running of hoist and rotator can be realized by operating the transfer handle, including the simultaneous running and respective running of them. By properly operating the transfer handle, the rotary table can obtain eight gears’ clockwise rotation speeds and two gears’ reverse speeds, and the hoist can obtain four gears’ clockwise rotation speeds and one gear reverse speed.

## 5. Hoist (Drawing 9)

Hoist is a typical planetary gear transmission mechanism. It is used for

lifting/lowering drilling tool, pressing/pulling up casing pipe and percussive drilling. Its left end is mounted on the drill upper frame and its right end is inserted into the transfer box by a spline shaft to obtain power. It can be separately transported from the transfer box.

After power is transmitted to the spindle of hoist, the spindle will drive a planetary mechanism which consists of a splined central gear, 3 planetary gears which are  $120^\circ$  from each other, and an inner ring gear, leading to the rotation of drum. Where, the hoisting band brake is coupled with the hoisting plate, and the drum's right outside circle is coupled with the braking band brake, as a result, the hoist may have three work conditions, namely hoisting, braking, and lowering down.

Hoisting: When the hoisting lever grips the hoisting plate and band brake is loosened (drawing 10), the drum runs positively, the wire rope is winded and therefore hoist is started.

If the drilling tool is light in weight (for example, hoisting the elevator without load) and it is necessary to adjust the hoisting speed during the hoisting process, the hoisting band brake can be properly released and for this moment, the planetary gear can conduct both rotation and revolution, which can realize the target of reducing the hoisting speed.

Caution: it is not allowed to carry out such an operation during the normal drilling with heavy load, otherwise it may cause the safety accident.

Lowering drilling tool: Properly or completely release the braking band brake while loosening the hoisting band brake, the drum will carry out the reverse rotation under the dead weight of drilling tool, which realizes the target of lowering down the drilling tool. The lowering speed can be controlled by using the braking band brake.

Braking: Loosen the hoisting band brake and operate the braking band brake handle properly, the drum may be gradually braked.

Caution: during the operation process, it is absolutely prohibited to brake the hoisting/braking band brakes simultaneously, or it may cause serious mechanical accident.

In case of any abnormal phenomenon during the drilling process, the operator may use the hoist to lift up the drilling tool to avoid the great accident. When motor or drill rig has any fault, use a spanner to sleeve the left square tail of hoist shaft and turn it to lift the drilling tools off the hole-bottom, so as to avoid in-hole accident.

## 6. Rotator (Drawing 11)

Rotator enables drilling tool to rotate and feed, and therefore perform drilling.

Rotating of vertical shaft: through engaging with the spiral bevel gears, the splined core pipe is driven to rotate, and the core pipe with inner hexagon hole then drives the hexagon vertical shaft to rotate. At the lower end of vertical shaft there is a connecting device combined with a flange and gears, through which the vertical shaft transmits rotation to the driving drill pipe and therefore drives the drilling tools to rotate.

Feeding of vertical shaft: Driven by two feeding cylinders (drawing 12), the cross beam fixed with the piston rods moves up and down. The cross beam is also connected with the vertical shaft, so it drives the vertical shaft to move up and down simultaneously.

The crossbeam's upper structure is a hydraulic plunger chuck, which is used to clamp/loosen drive pipe. The gripping ring fixed on the chuck oil cylinder is slipped up and down to drive two rollers in the chuck guide sleeve to realize the clamping and loosening of the drive pipe, so as to carry out the feeding operation via the movement of the vertical shaft. The chuck oil cylinder is the one-way feeding cylinder. The oil cylinder will move upward during the oil feeding to drive the gripping ring to compress the spring and loosen drive pipe, and during the oil return, the spring of gripping ring is reset to drive the gripping ring to move downward to enable the rollers to grip the driving drill pipe.

#### 7. Tap (Drawing 13)

The Tap is an accessory of this drill rig. There are several bearings in the housing, which ensures the core shaft, the upper part as well as the bearings to perform relative movement. A V-shaped rubber sealing ring is used to seal the water chamber, and its tightness may be adjusted through an adjusting bolt, which makes sure the movement is flexible and there is no leakage.

#### (II) Hydraulic Transmission System (Drawing 14)

The acts such as feeding, hoisting, clamping or loosening, moving forth or back can be obtained by changing the position of control valve handle, and different pressures of the system can be obtained by adjusting the hand wheel of overflow valve.

##### 1. Operating of multi-way directional valve

Its relief valve (pressure regulating valve) has two types of pressure-regulating ways: when operating the rapid pressure-regulating handle, the rapid pressure increase of the system can be realized, which shall be used for the rapid increase of pressure in a short time; when the system needs to be kept or be adjusted to a certain working pressure, it is necessary to rotate its hand wheel to regulate the pressure: clockwise rotation is for the increase of pressure and counterclockwise rotation for the decrease. Hydraulic chuck can be controlled by changing the position of operating handle of chuck directional valve: push the handle to position "Loosening of Chuck", the pressure oil flows into the ring-shaped oil cylinder of chuck and compress the spring to let the chuck to loosen the drilling tools; turn the handle to the position "Clamping of Chuck", the ring-shaped oil cylinder flows back to oil tank, then the chuck is driven by the spring to clamp the drilling tools; turn the handle to the Neutral position, the pressure oil or low-pressure returned oil is closed or sealed in the ring-shaped oil cylinder of chuck, which makes the chuck to keep the original loosening or clamping situation. Caution: under the working situation of long time, the operating handle shall be placed at Neutral position.

##### 2. Operating of vertical shaft feeding control valve

Operation of this valve shall be combined with the operation of the multi-way direction valve or the drillometer to meet different requirements of drilling technology.

1) When lowering down the vertical shaft or plus-pressure drilling, put the handle of vertical shaft feeding direction valve to the position "Lowering of Vertical Shaft" and adjust the handle of vertical shaft feeding control valve to control the lowering speed. Under certain working pressure of the system, the lowering speed of the vertical shaft

is decreased when rotating the hand wheel counterclockwise and the lowering speed is increased when rotating the hand wheel clockwise. In general, during the drilling under pressure, the dry-weight drilling or shallow-hole scanning, it is necessary to turn the handle of vertical shaft feeding control valve to its own limit position clockwise. During the plus-pressure drilling and the drilling under dry weight, it is necessary to adjust handle of overflow valve so as to adjust certain system pressure and meanwhile the operation shall be made in combination with drillometer.

### 3. Operating of vertical shaft feeding control valve

Operation of this valve shall be combined with the operation of the multi-way valve or the drillometer to meet the requirements of different drilling process.

1) When lowering the vertical shaft or performing plus-pressure drilling, put the handle of vertical shaft feeding directional valve to the position “Lowering of Vertical Shaft” and adjust the hand wheel of vertical shaft feeding control valve to control the lowering speed. Under a certain working pressure of the system, the lowering speed of the vertical shaft is decreased when rotating the hand wheel counterclockwise and the lowering speed is increased when rotating the hand wheel clockwise. In general, during the plus-pressure drilling, the dry-weight drilling or shallow-hole cleaning, it is necessary to turn the hand wheel of vertical shaft feeding control valve to its own limit position clockwise. During plus-pressure drilling and dry-weight drilling, it is necessary to adjust relief valve hand wheel so as to keep a certain system pressure and meanwhile the operation shall be made in combination with drillometer.

2) As for lifting or reverse feeding of vertical shaft, put the hand wheel of vertical shaft feeding directional valve to the position “Lifting of Vertical Shaft”. Under this working condition, it is unnecessary to adjust the hand wheel of vertical feeding control valve. Particularly under the condition that the hole bottom drillometer has been adjusted well, the reverse feeding of vertical shaft can be obtained while unnecessary to adjust the handle of vertical shaft feeding control valve so as to ensure that the hole bottom drilling pressure of the next procedure will not be basically changed.

3) As for minus-pressure drilling, put the handle of vertical shaft feeding directional valve to the position “Lowering of Vertical Shaft”. Rotate the handle of relief valve (pressure regulating valve) counterclockwise to adjust the system pressure towards zero pressure and then adjust the handle of vertical shaft feeding control valve to ensure that the pointer of the drillometer is pointed to the presetting pressure-reducing value. (Weighing before the minus-pressure drilling: put the red arrow of “weighing/minus-pressure indicator” on the “External Disc” of the drillometer to the pressure-reducing value in the yellow ring of “Static Disc”)

### 4. Operation of Drillometer

It is actually a normal pressure gauge with a measuring range of 0-10Mpa, which is used to point out the weight of drilling tool; and upon the reading of this drillometer, the hole bottom pressure is to be controlled, so as to guide the plus/minus-pressure drilling.

BZY-2 drillometer (Drawing 15) has two surfaces of “Static Disc” and “External Disc”. The blue inner ring on the “static disc” is the scale of pressure gauge and its

scale value is the pressure of unit area (Mpa), and the working pressure of hydraulic system can be read from this inner ring. The scale value of yellow outer ring on the “static disc” is made according to the product of pressure-bearing area and oil pressure of the lower chamber of vertical shaft feeding oil cylinder. Its scale value increases from zero as per clockwise direction (Unit: “kN”), which is applied to the weighing of drilling tools and minus-pressure drilling. The red scale on the “External Disc” is made according to the product of the ring-type pressure-bearing area and its oil pressure of the upper chamber of vertical shaft feeding oil cylinder, and its scale value increases from zero as per clockwise direction (Unit: “kN”), which is applied to plus-pressure drilling.

Operation Instruction of drillometer is as follows:

1) Weighing of drilling tools. Withdraw the drilling tool away from the hole bottom for a certain height and then put the handle of vertical shaft feeding directional valve to the position “Weighing of Vertical Shaft”. After the pointer of drillometer is basically stable, rotate “External Disc” to ensure the red arrow of “Weighing/Minus-Pressure Indicator” on the Disc is in alignment with the pointer of drillometer, then the scale value pointed by the arrow on yellow ring of “static disc” is the weight of drilling tools.

2) Plus-pressure Drilling. If the weight of drilling tools is 10kN by the said method, rotate the “External Disc” counterclockwise to ensure that the scale line of red scale value 10kN is in alignment with the centripetal red line below the “0” scale line on the “Static Disc”. If it needs 15kN of hole-bottom drilling pressure, operate the handle of vertical shaft feeding control valve to rotate it clockwise and then put the handle of vertical shaft feeding directional valve to the position “Lowering of Vertical Shaft”, and adjust the hand wheel of relief valve (pressure regulating valve) until the pointer of drillometer is pointed to the scale line of red scale value 15kN on “External Disc”. If it needs 12kN of drilling pressure, the pointer shall be adjusted to the scale line of red scale value 12kN on “External Disc”, and the rest may be deduced by analogy. After this, the normal plus-pressure drilling may be carried out.

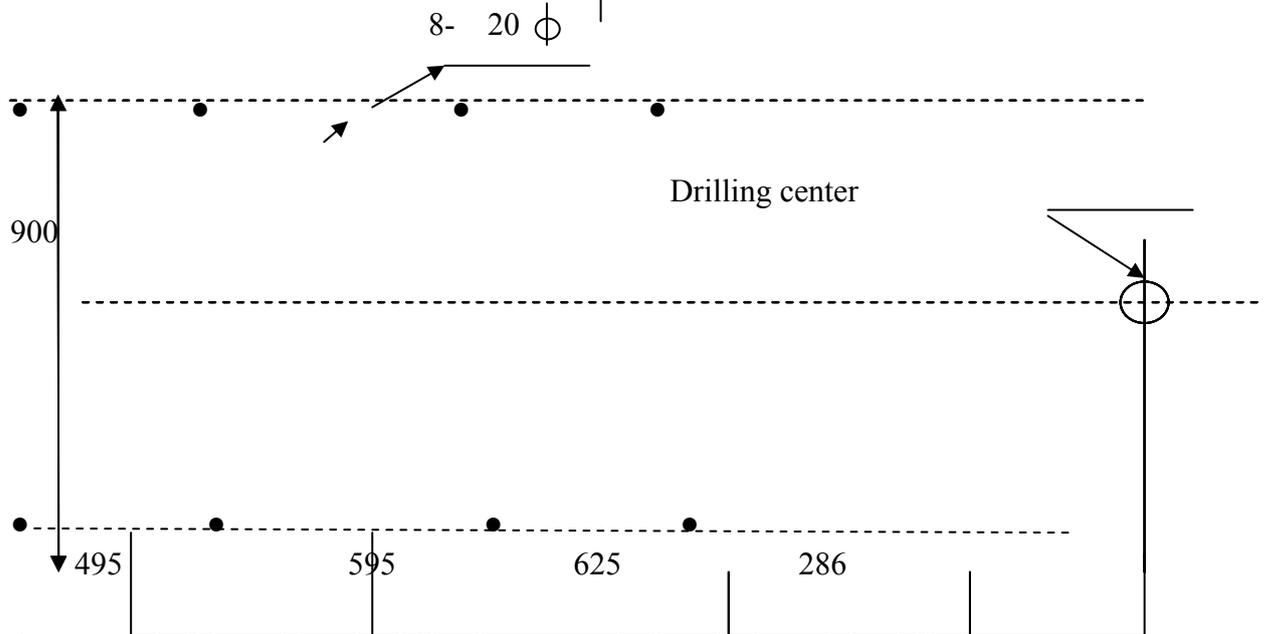
3) Minus-Pressure Drilling. In case that the weight of drilling tool weighed by said method is still 10kN. If the hole-bottom drilling pressure only needs 5kN, rotate the External Disc to ensure the red arrow with the “Weighing/Minus-Pressure Indicator” on the disc surface is in alignment with the scale line of yellow scale value  $10-5=5$ kN on the “Static Disc” and then the minus-pressure drilling can be operated. Put the handle of vertical shaft feeding directional valve to the position “Lowering of Vertical Shaft” and rotate the hand wheel of relief valve (pressure regulating valve) counterclockwise to adjust the pressure towards zero, and then adjust the hand wheel of throttle valve of vertical shaft feeding control valve to reduce slowly the pressure in the lower chamber of vertical shaft feeding oil cylinder until the pointer of the drillometer is pointed to the scale line of 5kN on the yellow scale ring (namely, the pointer is pointed to the red arrow of “weighing/minus-pressure indicator”), and then the normal minus-pressure drilling can be carried out, as shown in the drawings. If the hole-bottom drilling pressure only needs 6kN, the pointer shall be pointed to the  $10-6=4$ kN scale line on the yellow ring of the ‘Static Disc’, and the rest may be

deduced by analogy.

## V. Use and Maintenance

### (I) Installation of the Drill Rig

The drill base shall be fixed by anchor bolts onto ground wood beams, which shall be evenly and levelly mounted. The connection of wood beams shall be firm and reliable. The installation size of anchor bolts and bore prifice locations are as follows:



Attention shall be paid to the followings as to the installation of the drill rig:

1. Vertical shaft center, bore orifice and crown block pulley center of the drill rig shall be in the same line.

2. The wire rope of the hoist shall be firmly clamped onto the drum and it is necessary to carefully check the rope clamps at various positions to avoid the loosening.

### (II) Pre-operation Check and Preparation

1. Clean the surface of various parts and frame slide rails of the drill rig and check the protection devices;

2. Check the connecting reliability of bolts at various parts of the drill rig. In case of any failure, it is necessary to make fastening and adjusting;

3. Clean up working site, and remove the surplus articles from the working site;

4. Refill the lubricating oil or grease as per lubrication requirement, especially check the oil volume in oil tank, transmission case, transfer box, and rotator.

5. Check the flexibility of various handles and their positioning correction & reliability;

6. Check whether the lubricating oil of diesel engine is sufficient or surplus and its diesel oil is sufficient or not.

### (III) Commissioning Inspection

1. Check the tightness of triangle belts of gear oil pump, and if necessary, make adjustment;

2. Regulate the system pressure to 8Mpa and check the correction of various working

positions of the drill rig and check the oil leakage condition of instruments, oil cylinder, oil pipes and joints. If necessary, the treatment shall be made.

3. Check whether the drillometer works well;
4. Check the tightness of band brake of the hoist during the operation, and the fastening of the wire rope;
5. Check the flexibility of various transmission elements, check if noise occurs during the engaging process of the clutch; check the operating flexibility of various shifting gears and the positioning reliability and the noise condition during the disengaging process of the clutch;
6. Check the reliability of mobile/fixed devices of the drill rig and the moderation of the gap.

#### (IV) Attentions during Drilling Operation

Before using this drill rig, it is necessary to master or well know the usage of operating handles and their corresponding positions to avoid the damages. Attention shall be paid to the followings:

1. It is necessary to check the correction of the handle positions before starting the drill rig, for example, shifting lever of transmission case shall be at position “Neutral” before starting the drill rig;
2. The shifting lever of transmission case and transfer box can be operated only after the operating clutch is disengaged and the speed of gears is slow or stopped;
3. It is not allowed to operate the hoisting handle and braking handle of the hoist simultaneously and use the hoist for a overload lifting;
4. Do not operate the handles of multi-way directional valve simultaneously except the relief valve handle;
5. The transfer handle of transfer box shall be at position “Neutral” when using the hoist to lift/lower drilling tool;
6. When starting the power machine, the clutch shall be at disengaged status; do not engage the clutch to start the drill rig until the power machine runs properly, and the operation shall be even and smooth;
7. The shifting gears shall be geared to their proper positions to avoid the sliding of gears that may cause damage;
8. It is necessary to check the temperature of moving parts during the working, such as bearings, gear box, etc., whose temperature rise shall be no more than 40°C;
9. Before starting the drilling, the drilling tools shall be lifted up away from the bore bottom and then the normal drilling may be made after it runs properly.
10. The lock devices of the drill rig shall be fastened before starting.
11. There shall be no oil dirt on inner surface of braking band;
12. In the event that the temperature of any part or component is too high and in case of any abnormal noise during the working process, it is necessary to stop the drill rig immediately to make troubleshooting;
13. Under the braking condition of band brake, the operator shall not go away from the drill rig and if necessary, use a pawl to clamp the brake cam;
14. It is necessary to wipe off the surface of frame slide rails and fill the lubricating

oil before moving the drill rig. The lock devices must be loosened before moving the drill rig backward;

15. During the normal drilling, the lifting band brake shall be in completely loose situation to avoid withdrawing the drilling tools or causing any accident due to the braking of the band brake;

16. In order to rationally use the hydraulic system and ensure the safe operation, the working pressure of various hydraulic devices is recommended as follows:

Hydraulic System	Contents	Working Pressure (Mpa)	Pressure-regulating Way
Feeding oil cylinder	Plus/minus pressure drilling	0-5	Regulated by hand wheel
	Lifting or hoisting	0-8	Regulated by hand wheel or the fast-speed handle
Moving oil cylinder	Moving forth or back of the drill rig	3-4	Regulated by the fast-speed handle
Chuck oil cylinder	Loosen the chuck	3-4	Regulated by the fast-speed handle

#### (V) Maintenance and Serving

1. Lubricating: Check the oil tank, gear box for oil level once each day. The lubricating oil of gearbox shall be changed after first running of 200 hours, and 400 hours for the second time, and then once per 600 hours regularly. Before each refilling, the case needs to be cleaned with light oil. The oil cups and nipples of each part as well as other lubricating devices need to be frequently checked, and fill them with proper amount of lubricant (grease) if necessary.

2. Gear box adopts the gear oil 80W/90(ZBE34006-87) and hoist's planetary mechanism, rotator and bearings adopt the complex calcium lubricating grease ZFG-1(ZBE36003-88);

3. If the drill rig will not be used for a long time, its exposed surfaces (especially the machined surfaces) shall be coated with the lubricant or grease;

4. To lubricate the surface of slide rails, pour gear oil onto it after the mud on rails is wiped off; refilling the gear oil once every a withdrawal of the drilling tools;

The power machine affiliated to the drill rig shall be used and maintained as per the provisions set forth in its Operator's Instructions.

#### (VI) Common Troubles and Troubleshooting

No.	Problems	Causes	Troubleshooting
1	Friction clutch is slippery and overheated.	Friction disc gap is too big	Adjust it as per the Part III of Instructions
		Friction disc is abraded	Replace friction disc
2	Shifting lever of transmission case malfunctioned	Shifting lever balls separated from the fork groove	Screw the ball-type nut on side cover of transmission case

3	Hoist's band brake is slippery	Oil dirt on brake band and brake wheel, or maladjustment for gap between band brake and brake wheel	Gasoline is used to clean the inner surface of band, and properly adjust the gap
4	Hydraulic chuck does not work	Insufficient pressure of hydraulic system	Regulate hydraulic valve hand-wheel to ensure the system pressure at 3-4Mpa
		Serious oil leakage of chuck control valve	Replace the valve
5	Oil leakage for hydraulic chuck	Seal ring damaged	Replace seal ring
		Top snap ring of chuck is mounted reversely	Face of snap ring with terrace shall be mounted downward
6	Insufficient system pressure	Oil leakage for oil cylinders, valves, oil pipes or connectors	Eliminate the oil leakage
		Oil cylinder is overdue abraded	Replace oil pump
7	Oil pump is not oiled after startup	Insufficient oil in oil tank.	Refill oil
		Filter is blocked	Clean the filter
8	Temperature of oil pump is too high.	Heavy viscosity for hydraulic oil	Replace hydraulic oil
		Oil pump is abraded	Replace oil pump
		Transmission equipment of oil pump is not in alignment with the pump assembly	Adjust the two centers to make them aligned with each other
9	Oil temperature of hydraulic system is too high	Working under high pressure is too long	Feeding control valve shall be used when applying minus-pressure drilling
		Oil pump damaged	Replace oil pump
		Oil amount in oil tank is little	Refill hydraulic oil
10	Cylinder has creeping-vibration during operation	Air in oil cylinder	Run the cylinder for a few strokes to expel air
		Oil leakage for pipelines	Check and repair

		Mechanic jam	Check and repair
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## VI Other Technical Documents

### (I) Bearing Catalogue of GY-300A Drill Rig

S. N.	Parts	Name	Bearing Code	Spec.	Qty.
1	Clutch	Single direction thrust ball bearing with internal and external covers	688711K1	55×92×23	1
		Single row radial ball bearing with dust cap	60208	40×80×18	1
		Single row radial ball bearing with dust cap	60206	30×62×16	1
2	Transmission Case	Single row radial ball bearing	50308	40×90×23	2
		Long cylindrical roller bearing	K253530		1
		Single row radial bearing	210	50×90×10	1
		Single row radial bearing	306	30×72×19	2
		Single row radial ball bearing	207	35×72×17	4
3	Transfer Box	Single row radial ball bearing	208	40×80×18	1
		Single row radial ball bearing	308	40×90×23	2
		Single row radial thrust ball bearing	36310	50×110×27	2
		Single row radial ball bearing	115	75×115×20	2
		Both sides sealed bearing	180308	40×90×23	1
		Bearing	36221	105×190×36	1
4	Rotator	Bearing	46128	140×210×33	2
		Single row radial ball bearing	221	105×190×36	1
		Single row thrust ball bearing	8126	130×170×30	1
		Single row thrust ball bearing	8132	160×200×31	1
		Bearing	207	35×72×17	2
5	Hydraulic System	Deep groove ball bearing	313	65×140×33	2
		Deep groove ball bearing	213	35×120×23	1
		Deep groove ball bearing	205	30×62×16	6
		Deep groove ball bearing	310	50×110×27	1
		Shielded deep groove ball bearing	80112	60×95×18	2
7	Tap	Bearing	211	55×100×21	1
		Bearing	8211	55×90×25	1
		Bearing	212	60×110×22	1
8	Elevator	Bearing	8211	55×90×25	1

## (II) Packing List of GY-300A Drill Rig

S.N.	Name	Drawing No.	Spec.	Qty.	Remark
1	Drill assembly			1	
	Engine		395K2	1	
2	Accessories and tools				
	Driving drill pipe	G1200-05-38	∅ 76,L=6M	1	
	Elevator	G300-10-00		1 set	Price separately
	Tap	G300A-09-00		1 set	Price separately
	Tool box			1 set	
	Padding fork	G200-10-02	With ∅50 drill pipe	1	
	Wrench for drilling pipe	G1200-09-01-00		1	
	Lower joint of drill pipe	G300-11-02	With ∅50 drill pipe	1	
	Hook	G300-11-03		1	
	Wire rope of hoist (with nuts)		∅ 14,L=45m	1	
	Wire rope clamp		∅ 14	2	
	Shackle		T-DW16 GB10603	1	4 tons
	Puller			1 set	
3	Sealing parts				
	O-ring	GB1235-76	185×5.7	1	Rotator
	O-ring	GB1235-76	190×5.7	1	Rotator
	O-ring	GB1235-76	95×3.1	1	Rotator
	O-ring	GB1235-76	70×3.1	2	Feeding cylinder
	O-ring	GB1235-76	63×3.1	1	Moving cylinder
	O-ring	GB1235-76	38×3.5	1	Moving cylinder
	O-ring	GB1235-76	28×3.1	2	Feeding cylinder
	O-ring	GB1235-76	25×2.4	1	Moving cylinder
	O-ring	GB1235-76	20×2.4	1	Transfer box

	O-ring	GB1235-76	45×3.1	1	Transfer box
	Dust ring		J32	1	Moving cylinder
	Dust ring		J35	2	Feeding cylinder
	Sealing ring	HAIDA-5 (Three Gates)	UN32×42×6	1	Moving cylinder
	Sealing ring	HAIDA-5 (Three Gates)	UN35×45×6	2	Feeding cylinder
	Sealing ring	HAIDA-5 (Three Gates)	UN53×63×6	2	Moving cylinder
	Yx-ring for hole	CY115-85	D70	4	Feeding cylinder
	Guiding band		2.5×15	1	Moving cylinder
	Guiding band		2.5×15	2	Feeding cylinder
	Bonded seal washer	JB982-77	22	20	
	Bonded seal washer	JB982-77	16	2	
	Bonded seal washer	JB982-77	27	4	
	Bonded seal washer	JB982-77	33	2	
	Rubber oil seal with reinforce	HG4-692-67	PD50×72×12	2	Transmission case, transfer box
	Rubber oil seal with reinforce	HG4-692-67	PD72×95×12	1	Transfer box
	Rubber oil seal with reinforce	HG4-692-67	PD75×100×12	1	Transfer box
	Rubber oil seal with reinforce	HG4-692-67	PD20×35×10	1	Transfer box
	Rubber oil seal with reinforce	HG4-692-67	PD140×175×16	2	Rotator
	Rubber oil seal with reinforce	HG4-692-67	PD125×150×15	2	Rotator
	Rubber oil seal with reinforce	HG4-692-67	PD130×160×15	1	Rotator
	Rubber oil seal with reinforce	HG4-692-67	PD65×90×12	1	Hoist
	Rubber oil seal with reinforce	HG4-692-67	PD170×200×16	1	Hoist
	Support ring (B)	HG4-337-66	45×65	2	Tap

	Sealing ring (B)	HG4-337-66	45×65	6	
	Press ring (B)	HG4-337-66	45×65	2	
	Elastic cylinder	G300-02-03		6	
4	Accessories & tools of Diesel engine			1 set	
	File folder			1	

