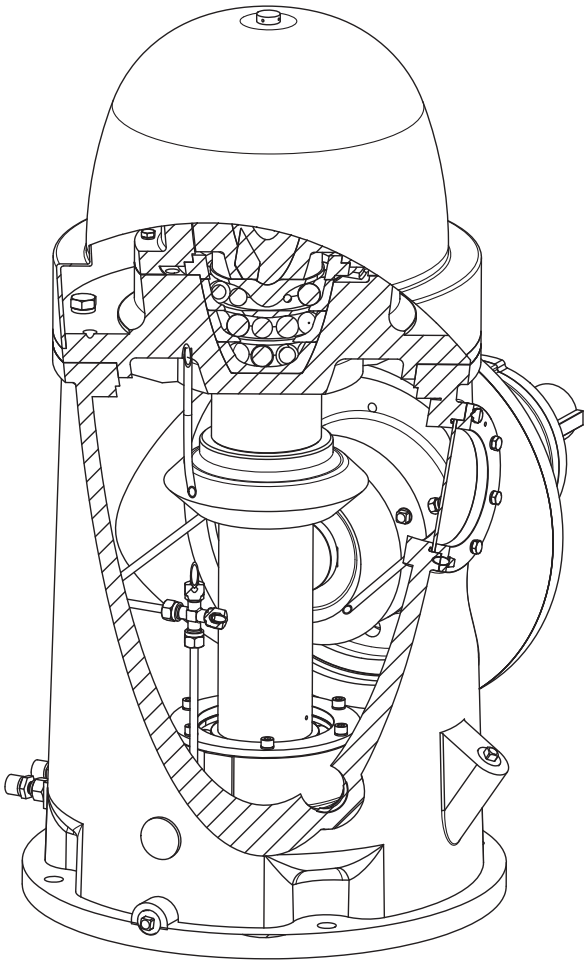
9060 RAG SERIES

RIGHT ANGLE GEAR DRIVES

INSTALLATION, OPERATION & MAINTENANCE MANUAL



FM APPROVED

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OVERVIEW

AMERIFLO has used the most current and advanced technology for research and design when engineering the power transmission portion of the product line. A concentrated focus on state-of-the-art quality control during the manufacturing process ensures safety and reliability as primary goals.

This manual is designed so that the end user becomes familiar with the characteristics and proper operation of the driveshaft product line.

This manual provides very important guidance for the installation, reliable operation and efficient maintenance when the need arises. The operating procedures must be strictly followed to ensure reliability of the product and to maximize the service life of the driveshaft with a focus on avoiding injury and hazards.

Local laws & regulations are not taken into account in this manual as they can vary greatly from region to region. Operators must ensure total and strict compliance with local laws and regulations, including proper procedures required during the installation process.

Do not operate any equipment in excess of it's limits as specified in this operating manual, including transmission medium, flow, rated speed, density, pressure and temperature. The end user must ensure the operation of the driveshaft is in accordance with this manual.

If you have any questions, please contact AMERIFLO with your serial number & nameplate information. AMERIFLO can assist you if damage has occurred to the equipment and/or if the need arrises for spare parts.

SAFETY PRECAUTIONS

This installation, operation & maintenance manual contains general installation, operation and maintenance instructions that must be followed. This manual must be read and understood in it's entirety by the responsible personnel/operators prior to installation and commissioning and the manual must be kept readily available at the job site for easy access.

To minimize risk of injury or death, the "safety" provisions of this entire manual MUST be followed. AMERIFLO shall not be liable for physical injury, damage or delays caused by a failure to observe the instructions for installation, operation & maintenance contained in this manual.

Paying constant attention to safety is always extremely important. This manual covers areas of danger that require additional attention. These areas of precaution are identified by using the following symbols:

DANGER - Immediate hazards which WILL result in severe personal injury or death.

WARNING - Hazards or unsafe practices which COULD result in severe personal injury or death.

CAUTION - Hazards or unsafe practices which COULD result in minor personal injury or property damage.

SHOCK HAZARD - ELECTRICAL Hazards are present which COULD result in severe personal injury or death.

ROTATING EQUIPMENT - Hazards are present which COULD result in severe personal injury or death.

Equipment maximum lifting speed of 15 FT/S [4.6 M/S] should not be exceeded.

In colder climates where liquid could freeze in the pump or engine, precautions must be made to make sure the fluid never freezes. Freezing fluid can damage equipment. Drain fluid from any piece of equipment in this environment.

Never start or run equipment without a proper prime. Significant damage to the equipment can occur.

Never operate any pump for an extended period of time with a closed discharge valve. The allowable amount of time a pump can operate in this condition depends on several variables at the job site. Contact AMERIFLO for proper engineering support.

Never operate any pump for an extended period of time below minimum flow. Temperature rise and extreme damage can occur.

Never operate any pump with a closed suction valve.

If excessive noise is heard from any rotating piece of equipment, shut the equipment down immediately.

Always lockout power before doing any maintenance on the pump or driver.

Never operate the pump & driver without a proper coupling guard in place.

If any leaks of hazardous fluids are identified, shut the unit down immediately and address the issue.

PERSONNEL QUALIFICATION

All personnel involved in the installation, operation & maintenance must be fully qualified to manage, operate, maintain, inspect and install the driveshaft assembly. The responsibilities, competence and supervision of all personnel involved in installation, operation and maintenance must be clearly defined by the end user. Lack of knowledge must be addressed by means of training and instruction provided by sufficiently trained personnel. Upon request, the end user can contact AMERIFLO to train the operators and end user. In addition, it is the responsibility of the operator to ensure that the operating instructions contained in this manual are fully understood by all parties involved with the equipment.

NON-COMPLIANCE

Non-compliance with the safety instructions contained in this manual can result in an accident causing damage to equipment, the site and to personal injury or death. The end user is solely responsible for correctly installing all equipment and a safely run operation after installation.

INSPECTION & INSTALLATION

The operator will ensure that maintenance, inspection and installation is performed by authorized, qualified personnel who are thoroughly familiar with this manual and the operation of this equipment. **WORK MUST BE PERFORMED ON A DRIVESHAFT ONLY AFTER THE PIECE OF EQUIPMENT HAS BEEN COMPLETELY LOCKED OUT OF OPERATION**. When taking the driveshaft unit out of service always adhere to the strict procedures described in the manual. As soon as the work has been completed, re-install and re-activate any safety-relevant devices and protective devices. Before returning the product to service, review all instructions before restarting any equipment.

UNAUTHORIZED MODIFICATION

Modifications or alterations to the right angle gear drive are only permitted with the manufacturer's prior written consent. Use only original spare parts or parts authorized by AMERIFLO. The use of other parts will invalidate any remaining warranty. Warranty relating to the right angle gear drive is only valid if the equipment is used in accordance with its intended use and only authentic AMERIFLO parts are used for maintenance and repair. Never operate the driveshaft outside of the limits stated in the driveshaft data sheet and information contained in this manual.

GENERAL INSTRUCTIONS

The right angle gear drive must be examined upon arrival to ascertain any damage caused during shipment. If damaged, immediately notify the carrier and/or the sender. Confirm that the goods correspond exactly to the description on the shipping documents and report any differences as soon as possible to AMERIFLO. Always reference the right angle gear drive serial number etched on the part.

The driveshaft unit must be used only for applications for which AMERIFLO has specified:

- The construction materials
- The operating conditions (flow, pressure, temperature, etc.)
- The field of application

In case of doubt, contact AMERIFLO.

TRANSPORT & LIFTING

The right angle gear drive must be transported in the vertical position.

Proper handling measures must be followed during transportation of equipment. Observe the following precautions.

CAUTION - Maximum lifting speed is 15 FT/S (4.6 M/S)

During all phases of transportation (truck, rail & ocean) all components must be handled and transported by using suitable slings and hoists. All handling should be carried out by specially trained personnel to avoid damage to the equipment and persons. The lifting rings attached to various components should be used exclusively to lift the

components for which they have been supplied.

CAUTION - All equipment shall be bolted to a suitable pallet or strapped down appropriately during transport. All loose parts should be crated accordingly.

It is important to exercise extreme care in handling and installing all components. Certain items are precision machined for proper alignment and if dropped or mistreated in any way, misalignment and malfunction can result. The insulation on all wire must be protected. Parts which are too heavy to be lifted from the transporting vehicle should be skidded slowly and carefully to the ground to prevent damage. Never unload any item by dropping parts directly from the truck to the ground.

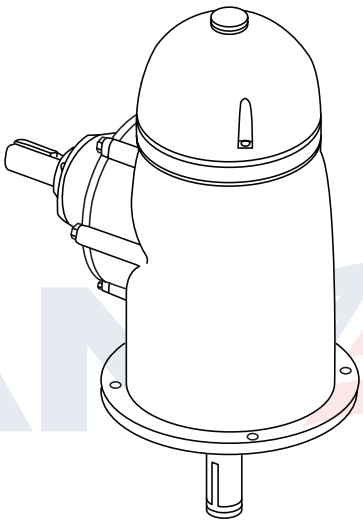

FIGURE 1 - PROPER TRANSPORT

If job site conditions permit, you may be able to install directly from the truck that delivered the equipment. If not, move the components to the installation area and lay them out in a clean and protected space convenient to the work location.

If installation cannot begin within a few days after delivery, segregate and identify all components of the shipment so they will not be confused with other equipment arriving at the job site.

Read and follow the storage instructions carefully as care of the pump during this period before installation can be as important as maintenance after operation has begun.

Check all parts against the packing list to make sure nothing is missing. It is much better to find out now than during the installation. If damage occurred during transportation report it to the carrier immediately. Freight claims MUST be reported by the recipient. Report any item discrepancies immediately to AMERIFLO.

STORAGE

SHORT-TERM STORAGE

Normal shipment packaging is designed to protect the pump and driver during shipment and for dry, indoor storage for up to two months or less.

If the Right Angle Gear drive is not to be installed or operated soon after delivery, store the unit in a clean, dry place, having slow changes in environmental conditions. Steps should be taken to protect the pump against moisture, dirt and foreign particulate intrusion. The procedure followed for this short-term storage is summarized below:

Standard Protection for Shipment:

a. Loose unmounted items, including, but not limited to, packing and coupling spacers are packaged in a water proof plastic bag and placed under the coupling guard. Larger items are boxed and metal banded to the base plate. All bags and cartons are identified with the AMERIFLO sales order number, the customer purchase order number and the pump item number (if applicable).

b. Inner surfaces of the bearing housing, shaft (area through bearing housing) and bearings are coated with Cortec VCI-329 rust inhibitor or equal.

c. Re-greasable bearings are packed with grease.

d. Flange faces are protected with plastic covers secured with plastic drive bolts. 3/16 in (7.8 mm) steel or 1/4 in (6.3 mm) wood covers with rubber gaskets, steel bolts and nuts are all available for extra cost.

e. All assemblies are bolted to a wood skid which confines the assembly within the perimeter of the skid.

f. Assemblies with special paint are protected with a plastic wrap.

g. All assemblies having external piping (seal flush and cooling water plans), etc. are packaged and braced to withstand normal handling during shipment. In some cases components may be disassembled for shipment. The pump must be stored in a covered, dry location.

It is recommended that the following procedure is taken:

1. Ensure that the bearings are packed properly to prevent moisture from entering the bearing housings.

2. If the Right Angle Gear drive is to be stored outdoors with no overhead covering, cover the unit with a tarp or other suitable covering.

LONG-TERM STORAGE

Long-term storage is defined as more than two months, but less than 12 months. The procedure AMERIFLO follows for long-term storage of pumps is given below. These procedures are in addition to the short-term procedure above.

Solid wood skids are utilized. Holes are drilled in the skid to accommodate the anchor bolt holes in the base plate or the casing and bearing housing feet holes on assemblies less base plate. Tackwrap sheeting is then placed on top of the skid and the pump assembly is placed on top of the Tackwrap. Metal bolts with washers and rubber bushings are inserted through the skid, the Tackwrap and the assembly from the bottom of the skid and are then secured with hex nuts. When the nuts are “snugged” down to the top of the base plate or casing and bearing housing feet, the rubber bushing is expanded, sealing the hole from the atmosphere. Desiccant bags are placed on the Tackwrap. The Tackwrap is drawn up around the assembly and hermetically (heat) sealed across the top. The assembly is completely sealed from the atmosphere and the desiccant will absorb any entrapped moisture. A solid wood box is then used to cover the assembly to provide protection from the elements and handling. This packaging will provide protection up to twelve months without damage to bearings, lip seals, etc. due to humidity, salt laden air, dust, etc. After unpacking, protection will be the responsibility of the user. If units are to be idle for extended periods, the addition of lubricants, inhibitor oils and greases should be used.

Every three months, the shaft should be rotated approximately 10-15 revolutions. When the unit is ready to be installed, replace all old lubricant with new lubricant.

RIGHT ANGLE GEAR DRIVE IDENTIFICATION

MANUFACTURER

AMERIFLO
125 Morrison Road, Rossville TN 38066
United States of America

www.ameriflo-usa.com

CONSTRUCTION FEATURES

This manual describes the installation and maintenance instruction of universal joint driveshafts intended for use with diesel engine drivers. This manual will help you avoid accidents and preserve the manufacturers warranty. This manual applies to Right Angle Gear drive models of G100 to G500. Right angle gear drive should be installed in accordance with the Standard for Installation of Stationary Pumps for Fire Protection, NFPA 20.

DATE OF MANUFACTURER

The date of manufacture is indicated on the Sales Order paperwork.

INSTALLATION, OPERATION & MAINTENANCE MANUAL IDENTIFICATION

PREPARED: MAY 1, 2023 EDITION: 01
REVISION: DATE:

NAMEPLATE INFORMATION

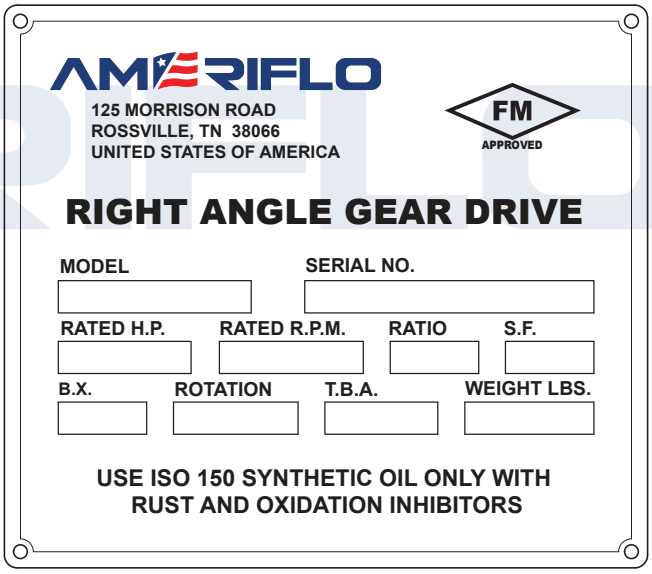

FIGURE 2 - PUMP NAMEPLATE

MODEL:
Model of the pump

SERIAL NUMBER:
Serial number of the pump issued by Production Control

RATED BHP:
Rated Brake Horsepower at duty point

RATED RPM:
Rated speed of the pump in Revolutions Per Minute

RATIO:
The ratio of the driver and driven helical gears

S.F.:
Rated Service Factor of the

B.X.:
The diameter of the shaft at the coupling

ROTATION:
Rotation of the shaft assembly

T.B.A.:
Thrust bearing arrangement

WEIGHT:
Weight of the assembly in pounds

WARRANTY

AMERIFLO offers new equipment manufactured by seller or service supplied by seller to be warranted to be free from defects in material and craftsmanship under normal use and service for a period of one year from date of shipment. Further details of the AMERIFLO warranty can be obtained from your AMERIFLO customer service representative.

INSTALLATION

The vertical turbine product line uses NEMA vertical motors in an electric installation and a right angle gear drive in a diesel engine installation. In both of these scenarios, the motor and gear have a P-base register to aid in alignment during installation. This P-base register makes installation very easy and no further alignment procedure is needed during installation. See FIGURE 3.

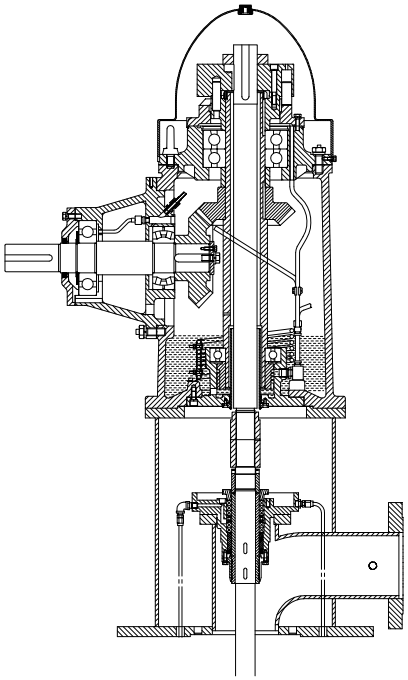

FIGURE 3 - PROPER ORIENTATION

For easier installation use anti-seize on all fasteners and use lockwashers on each fastener.

Install the driveshaft guard after proper driveshaft installation.

ROTATING EQUIPMENT - Severe injury and/or death can occur if all coupling guards are not properly installed PRIOR to pump startup.

ALIGNMENT

AXIAL IMPELLER ADJUSTMENT

After the complete vertical turbine pump has been installed you can proceed to mounting the motor of right angle gear drive. Make sure that both the motor or gear drive register and the discharge head register are clean and free of debris.

Remove the canopy from the motor or gear drive unit. Remove the drive coupling, the adjusting nut, locking screw and shaft key from the unit. See FIGURE 4.

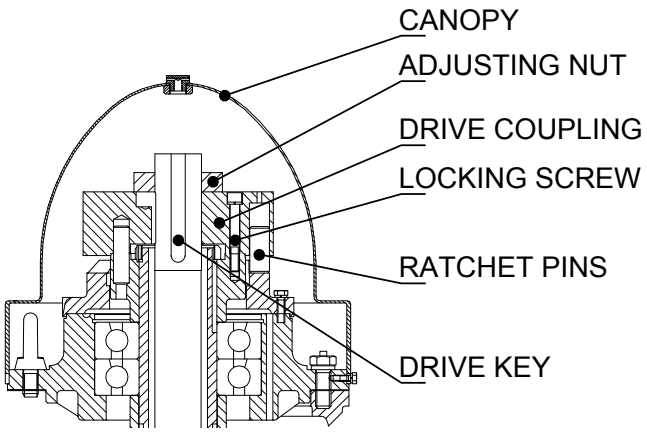

FIGURE 4 - COUPLING ASSEMBLY DRAWING

Place these items in a safe place and make sure no parts fall into the motor or gear drive. If this happens ALL parts must be retrieved PRIOR to startup.

Lower the Right Angle Gear drive slowly onto the discharge head so that the NEMA P-base register is engaged. Install the shaft into the motor or gear drive and thread into the coupling that is above the stuffing box. Install the adjusting nut.

Use the adjusting nut to raise the impellers a lateral distance equal to half of the total available. This can be easily accomplished in the field by raising the impellers until they begin to rub on the top of the bowls. Measure this total distance and place the impellers at the halfway point.

When finished, install the drive key and locking screw. Place the canopy back onto the electric motor or right angle gear drive.

After completing the shaft installation, install the canopy and hardware. Be sure that you check the oil level in the motor or gear drive PRIOR to start-up.

If using a right angle gear drive, make sure that the bearing cooler is also plumbed to water.

PUMP STARTUP

Refer to PRE-START UP and START-UP sheets at the end of this manual for proper start-up procedures.

ROTATION CHECK

WARNING - It is EXTREMELY important that the rotation of the motor is confirmed before installing the shaft coupling. Incorrect rotation, even for a short period, can cause catastrophic damage to the pumping unit.

Double check the rotation PRIOR to starting up the pump unit.

LUBRICATION

Frequency of lubrication depends upon operating conditions and environmental conditions, therefore, lubrication intervals must be determined by experience. TABLE 1 may be used as a general guide for oil changing times. Lubricants need replacing only because of contamination by dirt or dust, metal particles, moisture or high temperature breakdown.

When re-lubricating the driveshaft bearings:

- Thoroughly clean the grease fitting and outside of bearing housing.
- Remove the zerk fitting cap.
- Inject clean, new grease forcing out the old grease.
- Start and run the pump for a short time to eject any excess grease.
- Wipe off all excess grease and replace the zerk fitting cap.

COUPLING GUARDS

It is very important that all coupling guards (at the driver coupling and near the pump packing housing locations) be installed PRIOR to startup. Failure to do so can cause serious injury or death.

ROTATING EQUIPMENT - Severe injury and/or death can occur if all coupling guards are not properly installed PRIOR to pump startup.

AMBIENT CONDITIONS		OPERATING CONDITIONS		BEARING OPERATING TEMPERATURE		SUGGESTED OIL CHANGING INTERVALS ❶	OIL TYPE NEEDED
DIRTY	MOIST	LOAD	SPEED	LOW	HIGH		
CLEAN	DRY	LIGHT TO MEDIUM	SLOW TO MEDIUM	0ºF [-18ºC]	120ºF [49ºC]	6 TO 12 MONTHS	FOR OIL CAPACITY SEE TABLE 3 FOR OIL MANUFACTURERS SEE TABLE 4
				120ºF [49ºC]	200ºF [93ºC]	2 TO 6 MONTHS	
MODERATE TO DIRTY	DRY	LIGHT TO MEDIUM	SLOW TO MEDIUM	0ºF [-18ºC]	120ºF [49ºC]	1 TO 4 MONTHS	
				120ºF [49ºC]	200ºF [93ºC]	1 TO 2 MONTHS	
EXTREMELY DIRTY	DRY	LIGHT TO MEDIUM	SLOW TO MEDIUM	0ºF [-18ºC]	200ºF [93ºC]	2 TO 6 MONTHS	
	HIGH HUMIDITY (DIRECT CONTACT WITH WATER)	LIGHT TO MEDIUM	SLOW TO MEDIUM	32ºF [0ºC]	200ºF [93ºC]	2 TO 6 MONTHS	
		HEAVY TO VERY HEAVY	SLOW	0ºF [-18ºC]	120ºF [49ºC]	1 TO 2 MONTHS	
				120ºF [49ºC]	200ºF [93ºC]	1 TO 2 MONTHS	
		LIGHT	HIGH SPEED	100ºF [38ºC]	200ºF [93ºC]	1 TO 2 MONTHS	
	POSSIBLE FROST	LIGHT TO HEAVY	SLOW TO MEDIUM	-65ºF [-54ºC]	+250ºF [121ºC]	2 TO 6 MONTHS	
CLEAN TO MODERATE	DRY	LIGHT TO MEDIUM	SLOW TO MEDIUM	-65ºF [-54ºC]	+250ºF [121ºC]	1 TO 2 MONTHS	
CLEAN TO DIRTY	DRY	LIGHT	SLOW	80ºF [27ºC]	300ºF [149ºC]	1 TO 2 MONTHS	

❶ Suggested starting interval for maintenance program. Check OIL conditions for dirt and adjust greasing frequency accordingly. Watch operating temperatures as sudden rises may show the need for oil or indicate over lubrication on higher speed applications.

TABLE 1 - SUGGESTED RE-LUBRICATION INTERVALS FOR VARIOUS ENVIRONMENTAL, OPERATING & TEMPERATURE CONDITIONS

TROUBLESHOOTING

The following is a guide to troubleshooting problems with AMERIFLO Pumps & Engines. Common problems are analyzed and solutions are offered. Obviously, it is impossible to cover every possible scenario. If a problem exists that is not covered by one of these examples, then contact a local AMERIFLO Engineer or Distributor/ Representative for assistance. Refer to the appropriate AMERIFLO diesel engine Installation, Operation & Maintenance manual for specific engine service and troubleshooting instructions.

TROUBLESHOOTING

HIGH DRIVESHAFT BEARING TEMPERATURE	NOISY OPERATION & EXCESSIVE VIBRATION	HIGH PUMP BEARING TEMPERATURE	POSSIBLE CAUSE	REMEDY
✪	✪	✪	CAPSCREWS/STUDS ARE LOOSE OR DEFECTIVE	▪ INSPECT CAPSCREWS/STUDS ▪ RE-TIGHTEN THE FASTENER ▪ REPLACE THE HARDWARE ▪ INSPECT THE PIPING AND MAKE SURE ALL HARDWARE IS TIGHT
✪	✪		EXCESSIVE RADIAL MOVEMENT AT THE DRIVESHAFT YOKE	▪ LACK OF LUBRICATION ▪ LUBRICATE DRIVESHAFT BEARINGS
✪	✪		EXCESSIVE VIBRATION	▪ PERFORM SYSTEM VIBRATION ANALYSIS ▪ REDUCE DRIVESHAFT OFFSET ANGLE ▪ BEARINGS DAMAGED. REPLACE DRIVESHAFT
	✪		COMPANION FLANGE EXCESSIVE RUNOUT EXCEEDING 0.006 INCHES [0.15 MM]	▪ REPLACE DRIVESHAFT
✪	✪		DRIVER AND/OR PUMP SHAFT EXCESSIVE RUNOUT	▪ REFER TO FACTORY
	✪		DRIVESHAFT EXCEEDS OFFSET OF 2º	▪ REALIGN PUMP & DRIVER
	✪	✪	OPERATION SPEED AT FIRST OR SECOND ORDER RESONANCE	▪ PERFORM TORSIONAL ANALYSIS ▪ REFER TO FACTORY
	✪		COMPANION FLANGES NOT SEATED PROPERLY	▪ CHECK FOR BURS OR DEBRIS ▪ PERFORM SYSTEM VIBRATION ANALYSIS ▪ INSPECT CAPSCREWS/STUDS ▪ RE-TIGHTEN THE FASTENER ▪ REPLACE THE HARDWARE
✪	✪		EXCESSIVE PUMP NOISE	▪ REFER TO FACTORY
✪			ROTOR IMBALANCE	▪ CLEAN THE IMPELLER ▪ CHECK ROTOR BALANCE ▪ RE-BALANCE THE IMPELLER
✪	✪	✪	DEFECTIVE BEARINGS	▪ REPLACE DRIVESHAFT

MAINTENANCE

PREVENTATIVE MAINTENANCE

The MAINTENANCE section of this manual will give the end user a complete procedure for giving the pump a complete overhaul. There are also sub-sections that detail other important maintenance procedures that may come up during normal pump & driver operation. It is also important to note that periodically the PRE START-UP checklist should be reviewed to make sure that site conditions have not changed since the initial start-up.

NEED FOR MAINTENANCE RECORDS

It is very important that the end user keep a record of daily, weekly, monthly and yearly maintenance records. These records are important when certain milestone events that need to be performed are recorded in a central location. From these records other important information can be gathered including trending in certain data. The analysis of this data can help with future maintenance issues and also help with eliminating certain issues that may be effecting pump or driver performance. Lastly, when and if a warranty claim is ever addressed at some future date, AMERIFLO personnel will ask for all pertinent maintenance records so that they have a clear picture of what has been done to the unit.

NEED FOR CLEANLINESS

Perhaps the major cause of pump & driveshaft failure has to do with contamination at the job site. Contamination can be in the form of moisture, dust, dirt or other foreign debris from the job site. This contamination is very harmful to the bearings in the pump. Dust and other debris can plug air and fuel filters in diesel engine drivers.

It is very important to maintain as clean of an area as job site conditions permit. When preventative maintenance is being performed on the pump & driver, make sure this maintenance is done in a clean area as well. Do not unpack bearings until they are ready to be immediately installed. Make sure filters and engine fluids are changed per the recommended intervals. Work should be done in an area free of moisture, dust, dirt, oil or grease. Never re-use bearings, gaskets, lip seals, o-rings and filters. Only use clean towels, shop rags and other tools when performing maintenance.

MAINTENANCE OF PUMP DUE TO FLOOD DAMAGE

Due to the location of many pump rooms, flooding is a common occurrence. Servicing the driveshaft is a fairly straightforward process.

The driveshaft bearings need the most attention during this time period. Completely remove the driveshaft from the installation and replace. AMERIFLO's recommendation is that all bearings be replaced as all most likely have been in contact with water.

ROUTINE MAINTENANCE CHART

ROUTINE MAINTENANCE CHART		
SCHEDULE	**# PEOPLE**	**TASK**
EVERY WEEK	1	▪ VISUALLY CHECK FOR LEAKS ▪ CHECK FOR LUBRICATION ▪ TEST DRIVESHAFT BEARING FOR ANY SIGN OF TEMPERATURE RISE
EVERY MONTH	1	▪ CHECK DRIVESHAFT BEARING TEMPERATURE WITH INSTRUMENTATION
EVERY 6 MONTHS	1	▪ CHECK ALIGNMENT OF THE PUMP AND MOTOR ▪ CHECK HOLDING DOWN BOLTS FOR TIGHTNESS ▪ CHECK DRIVESHAFT FOR WEAR
EVERY YEAR	1	▪ CHECK ROTATING ELEMENT FOR WEAR
EVERY 2000 HOURS	1	▪ CHANGE RIGHT ANGLE GEAR DRIVE OIL
EVERY 5000 HOURS	2	▪ DRIVESHAFT BEARING INSPECTION
EVERY 4 YEARS	2	▪ COMPLETE PUMP SKID INSPECTION

TABLE 2 - ROUTINE MAINTENANCE

OIL RESERVOIR CAPACITY	
MODEL	**CAPACITY GALLONS [LITERS]**
G100	1.5 [5.5]
G150	3.4 [13.0]
G250	3.3 [12.5]
G350	3.3 [12.5]
G425	6.5 [25.0]
G500	6.5 [25.0]

TABLE 3 - RIGHT ANGLE GEAR DRIVE OIL CAPACITY

AMBIENT TEMPERATURE °F [°C] ❶	14°F TO 61°F [-10°C TO 16°C]	14°F TO 126°F [-10°C TO 52°C]
A.G.M.A. GRADE	2	3
VISCOSITY S.S.U. @ 100°F	284 - 347	417 - 510
ISO VISCOSITY (CST) @ TEMPERATURE	68	100
AMOCO	IND OIL 68	IND OIL 100
CATO OIL	AW/AL 20	AW/AL 30
CHEVRON	A.W. MACH 68	A.W. MACH 100
CITGO	PACEMAKER 68	PACEMAKER 100
EXXON	TERESSTIC 68	TERESSTIC 100
GETTY	TEXACO	SKELVIS-MP30
MOBILE	DTE HEAVY MED	DTE HEAVY
PACER	THERMAL T68	THERMAL T100
SHELL	TURBO 68	TURBO 100
SUN	SUNVIS 931	SUNVIS 951
TEXACO	REGAL R&O 68	REGAL R&O 68

❶ S.A.E. automotive oils are NOT recommended and must NOT be used in any Right Angle Gear Drive assembly. Use of these lubricating fluids will void any remaining warranty on the Right Angle Gear drive.

TABLE 4 - SUGGESTED OIL MANUFACTURERS BASED ON TEMPERATURE CONDITIONS

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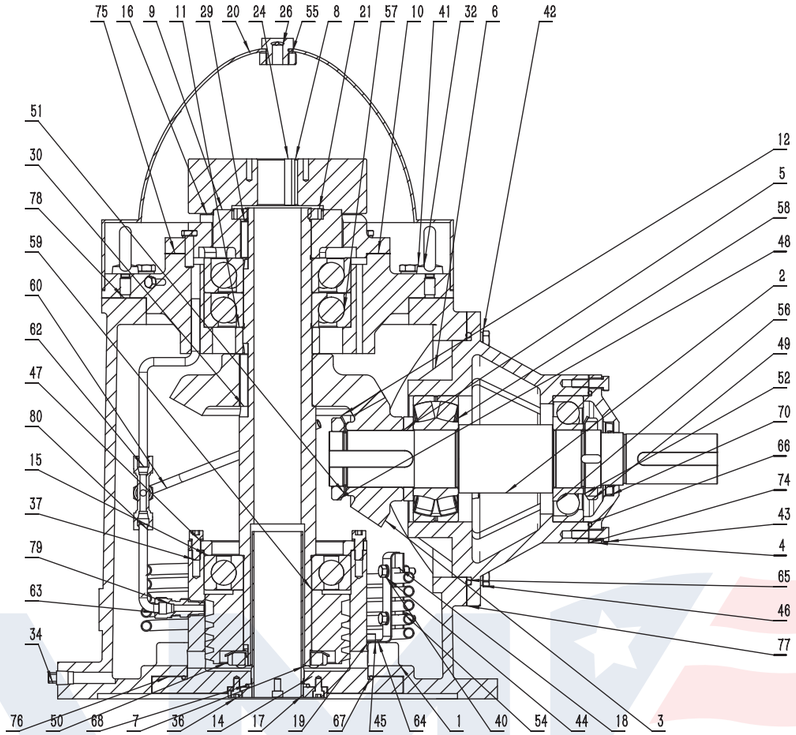
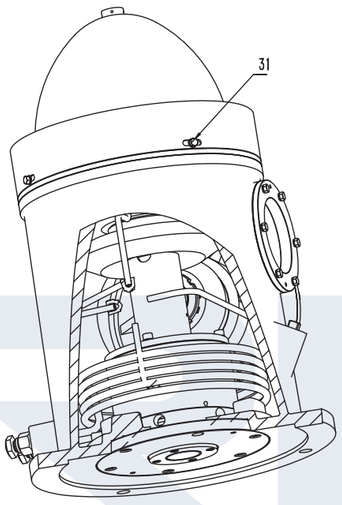
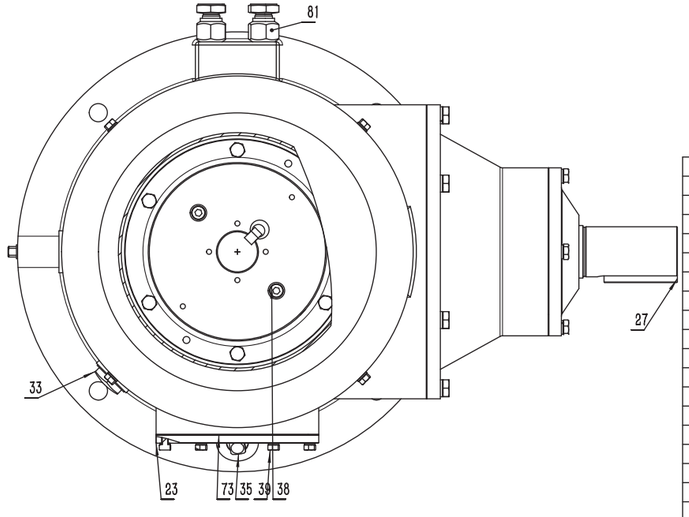






81	Q/AQ151.1 E10	Straight pipe joint	3/8"	2		
80	GB/T 3746	Jacketed four-way joint	L8	1		
79	GB/T 3734	Straight pipe joint	L8/R1/4	1		
78		Paper washer	φ335×φ250	1		
77		Paper washer	φ280×φ225	1		
76		Paper washer	φ240×φ172	1		
75		Paper washer	φ215×φ170	1		
74		Paper washer	φ160×φ120	1		
73		Paper washer	φ155×φ125	1		
72	GB/T 119.2	Cylinder pin	12×32	2		
71	GB/T 119.2	Cylinder pin	3×18	1		
70	GB/T 13871.1	Lip-seal	FB50×70×8	1		
69	GB/T 3452.1	O-Ring	118×3.55	1		
68	GB/T 3452.1	O-Ring	54.5×3.55	1		
67	GB/T 3452.1	O-Ring	175×3.55	1		
66	GB/T 3452.1	O-Ring	122×3.55	1		
65	GB/T 3452.1	O-Ring	230×5.3	1		
64	GB/T 16866	Copper pipe	φ10×1	1		
63	GB/T 16866	Copper pipe	φ8×1	1		
No.	Code	Name	Specification	Qty.	Materials	Remarks

62	GB/T 16866	Copper pipe	φ8×1	1		
61	GB/T 16866	Copper pipe	φ8×1	1		
60	GB/T 16866	Copper pipe	φ8×1	1		
59	GB/T 276	Deep groove ball bearing	6313	1		
58	GB/T 288	Self-aligning roller bearing	22311	1		
57	GB/T 292	Angular contact ball bearing	7313B	2		
56	GB/T 292	Angular contact ball bearing	7311B	1		
55	GB/T 6173	Hex nut	M22×1.5	1		
54	GB/T 6170	Hex nut	M6	4		
53	GB/T 858	Lock washer	64	1		
52	GB/T 858	Lock washer	55	1		
51	GB/T 858	Lock washer	52	1		
50	GB/T 812	Round nut	M64×2LH	1		
49	GB/T 812	Round nut	M55×2LH	1		
48	GB/T 812	Round nut	M52×1.5	1		
47	GB/T 93	Spring washer	8	22		
46	GB/T 93	Spring washer	10	12		
45	GB/T 93	Spring washer	6	12		
44	GB/T 97.1	Flat washer	6	12		
43	GB/T 5783	Hexagon bolt	M8×30	10		
42	GB/T 5783	Hexagon bolt	M10×30	6		
41	GB/T 5783	Hexagon bolt	M10×40	6		
40	GB/T 5783	Hexagon bolt	M6×30	4		
39	GB/T 5783	Hexagon bolt	M6×20	6		
38	GB/T 70.1	Hexagon socket cap screw	M8×50	2		
37	GB/T 70.1	Hexagon socket cap screw	M8×20	10		
36	GB/T 70.1	Hexagon socket cap screw	M6×12	6		
35	GB/T 26120 P1	Plug	1/2"	1		
34	GB/T 26120 P1	Plug	1/4"	1		
33	JB/T 7941.2	Oil leveler	A20	1		
32	GB/T 825	Lifting bolt	M10B	2		
31	GB/T 5783	Hexagon bolt	M6×16	4		
30	GB/T 1567	Key	B20×8×50	1		
29	GB/T 1567	Key	B18×7×35	1		
28	GB/T 1096	Key	B16×10×55	1		
27	ZJCLX-PJA-A 12.7×12.7×69.85	Key		1		
26	ZJCLX-TQM-φ30×M22×25	Vent cap		1		
25	ZJCLX-YZX-φ16×32	Cylinder pin		2		
24	ZJCLX-GTXXJ-9.53×30	Hook key		1		
23	ZJCLX-GCCJ-φ155×φ105×16	Window cover		1		
22	ZJCLX-GCC-φ125×3.5	Inspection window		1		
21	H100-073	Clamp ring		1		
20	H100-048	Dust cover		1		
19	H125-031-2	Splint		2		
18	H125-031-1	Splint		2		
17	H100-029	Oil seal housing		1		
16	H100-022	Ratchet wheel		1		
15	H100-020	Bearing gland		1		
14	H100-018	Baseboard		1		
13	H100-017	Screw oil pump wheel		1		
12	H100-016(5.3)	Driven gear		1		
11	H100-015	Bush		1		
10	H100-014	Thrust metal		1		
9	H100-013	Inertia wheel		1		
8	H100-012	Non-reverse coupling		1		
7	H100-011(5.3)	Output shaft		1		
6	H100-008	Bearing carrier		1		
5	H100-007	Adjusting washer		1		
4	H100-006	Bearing gland		1		
3	H100-003(5.3)	Driving gear		1		
2	H100-002(5.3)	Input shaft		1		
1	H100-001	Box		1		
No.	Code	Name	Specification	Qty.	Materials	Remarks

MARK	QTY	CHANGED FILE NO.	SIGN	DATE
DWN				DATE
PRF				DATE
CHD				DATE
REVD				DATE 2023/2/27

PART No.: G100-00 (5:3) A

MATERIAL :

PROJECT :

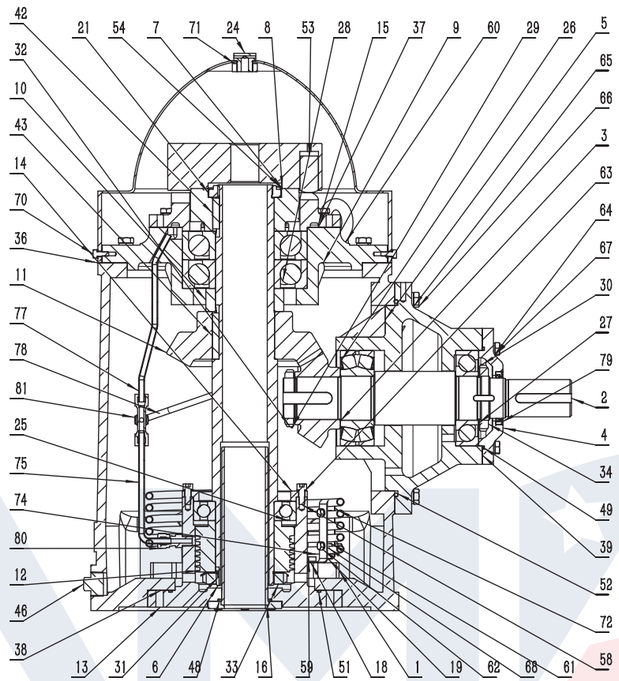
NAME : GEAR DRIVE ASSEMBLY

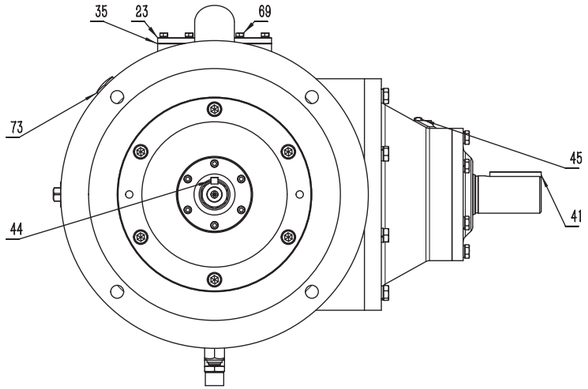
MARK	WT	SCALE
		1:3.5

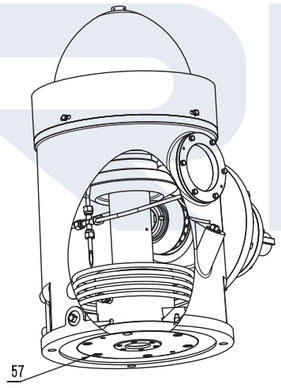
SHT OF

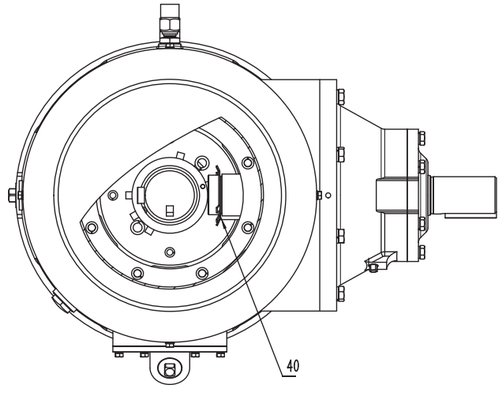
AMERIFLO

REV 2023A









62	GB/T 16866	Copper pipe	ϕ8×1	1		
61	GB/T 16866	Copper pipe	ϕ8×1	1		
60	GB/T 16866	Copper pipe	ϕ8×1	1		
59	GB/T 276	Deep groove ball bearing	6216	1		
58	GB/T 288	Self-aligning roller bearing	22312	1		
57	GB/T 292	Angular contact ball bearing	7316B	2		
56	GB/T 292	Angular contact ball bearing	7312B	1		
55	GB/T 6173	Hex nut	M22×1.5	1		
54	GB/T 6170	Hex nut	M6	4		
53	GB/T 858	Lock washer	64	1		
52	GB/T 858	Lock washer	55	1		
51	GB/T 858	Lock washer	52	1		
50	GB/T 812	Round nut	M64×2LH	1		
49	GB/T 812	Round nut	M55×2LH	1		
48	GB/T 812	Round nut	M52×1.5	1		
47	GB/T 93	Spring washer	8	22		
46	GB/T 93	Spring washer	10	12		
45	GB/T 93	Spring washer	6	12		
44	GB/T 97.1	Flat washer	6	12		
43	GB/T 5783	Hexagon bolt	M8×30	10		
42	GB/T 5783	Hexagon bolt	M10×30	6		
41	GB/T 5783	Hexagon bolt	M10×40	6		
40	GB/T 5783	Hexagon bolt	M6×30	4		
39	GB/T 5783	Hexagon bolt	M6×20	6		
38	GB/T 70.1	Hexagon socket cap screw	M8×50	2		
37	GB/T 70.1	Hexagon socket cap screw	M8×20	10		
36	GB/T 70.1	Hexagon socket cap screw	M6×12	6		
35	GB/T 26120 P1	Plug	1/2"	1		
34	GB/T 26120 P1	Plug	1/4"	1		
33	JB/T 7941.2	Oil leveler	A20	1		
32	GB/T 825	Lifting bolt	M10B	2		
31	GB/T 5783	Hexagon bolt	M6×16	4		
30	GB/T 1567	Key	B20×8×50	1		
29	GB/T 1567	Key	B18×7×35	1		
28	GB/T 1096	Key	B16×10×50	1		
27	ZJCLX-PJA-A 12.7×12.7×69.85	Key		1		
26	ZJCLX-TQM-ϕ30×M22×25	Vent cap		1		
25	ZJCLX-YZX-ϕ25×50	Cylinder pin		2		
24	ZJCLX-GTXXJ-9.53×40	Hook key		1		
23	ZJCLX-QCCG-ϕ155×ϕ105×16	Window cover		1		
22	ZJCLX-QCC-ϕ125×3.5	Inspection window		1		
21	H150-073	Clamp ring		1		
20	H150-048	Dust cover		1		
19	H150-031-2	Splint		2		
18	H150-031-1	Splint		2		
17	H150-029	Oil seal housing		1		
16	H150-022	Ratchet wheel		1		
15	H150-020	Bearing gland		1		
14	H150-018	Baseboard		1		
13	H150-017	Screw oil pump wheel		1		
12	H150-016(5.3)	Driven gear		1		
11	H150-015	Bush		1		
10	H150-014	Thrust metal		1		
9	H150-013	Inertia wheel		1		
8	H150-012	Non-reverse coupling		1		
7	H150-011(5.3)	Output shaft		1		
6	H150-008	Bearing carrier		1		
5	H150-007	Adjusting washer		1		
4	H150-006	Bearing gland		1		
3	H150-003(5.3)	Driving gear		1		
2	H150-002(5.3)	Input shaft		1		
1	H150-001	Box		1		

No.	Code	Name	Specification	Qty.	Materials	Remarks
81	Q/ANJ151.1 E10	Straight pipe joint	3/8"	2		
80	GB/T 3746	Jacketed four-way joint	L8	1		
79	GB/T 3734	Straight pipe joint	L8/R1/4	1		
78		Paper washer	ϕ335×ϕ250	1		
77		Paper washer	ϕ280×ϕ225	1		
76		Paper washer	ϕ240×ϕ172	1		
75		Paper washer	ϕ215×ϕ170	1		
74		Paper washer	ϕ160×ϕ120	1		
73		Paper washer	ϕ155×ϕ125	1		
72	GB/T 119.2	Cylinder pin	12×32	2		
71	GB/T 119.2	Cylinder pin	3×18	1		
70	GB/T 13871.1	Lip-seal	FB55×72×8	1		
69	GB/T 3452.1	O-Ring	118×3.55	1		
68	GB/T 3452.1	O-Ring	54.5×3.55	1		
67	GB/T 3452.1	O-Ring	175×3.55	1		
66	GB/T 3452.1	O-Ring	122×3.55	1		
65	GB/T 3452.1	O-Ring	230×5.3	1		
64	GB/T 16866	Copper pipe	ϕ10×1	1		
63	GB/T 16866	Copper pipe	ϕ8×1	1		

MARK	QTY	CHANGED FILE NO.	SIGN	DATE
DWN				DATE
PRF				DATE
CHD				DATE
REVD				DATE 2023/2/27

PART No.: G150-00 (5:3) A

MATERIAL :

PROJECT :

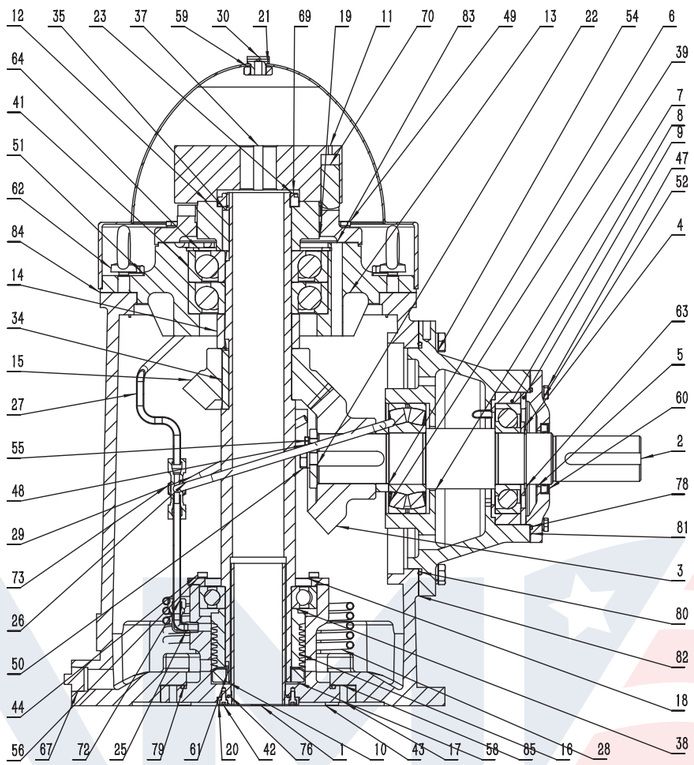
NAME : GEAR DRIVE ASSEMBLY

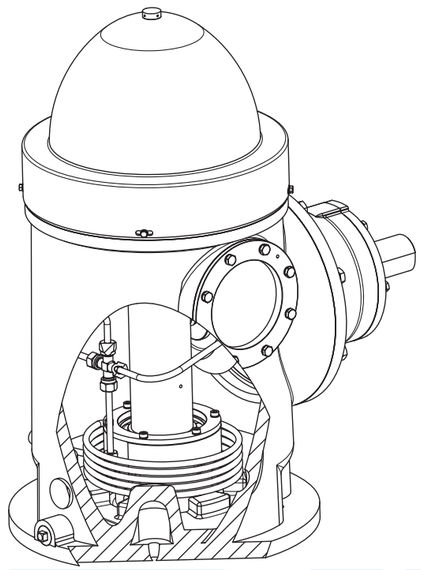
MARK	WT	SCALE
		1:5

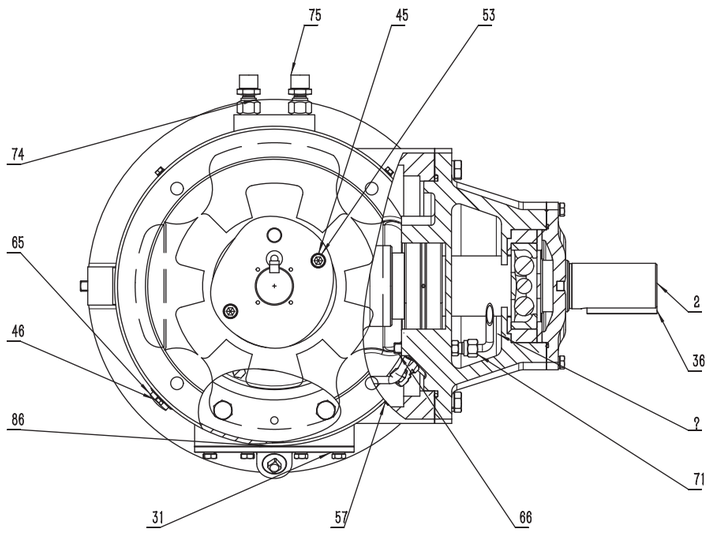
SHT OF

AMERIFLO

REV 2023A







No.	Code	Name	Specification	Qty.	Materials	Remarks
81	Q/ANG151.1 E10	Straight pipe joint	3/8"	2		
80	GB/T 3746	Jacketed four-way joint	L8	1		
79	GB/T 3734	Straight pipe joint	L8/R1/4	1		
78		Paper washer	ϕ335×ϕ250	1		
77		Paper washer	ϕ280×ϕ225	1		
76		Paper washer	ϕ240×ϕ172	1		
75		Paper washer	ϕ215×ϕ170	1		
74		Paper washer	ϕ160×ϕ120	1		
73		Paper washer	ϕ155×ϕ125	1		
72	GB/T 119.2	Cylinder pin	12×32	2		
71	GB/T 119.2	Cylinder pin	3×18	1		
70	GB/T 13871.1	Lip-seal	FB70×95×10	1		
69	GB/T 3452.1	O-Ring	118×3.55	1		
68	GB/T 3452.1	O-Ring	54.5×3.55	1		
67	GB/T 3452.1	O-Ring	175×3.55	1		
66	GB/T 3452.1	O-Ring	122×3.55	1		
65	GB/T 3452.1	O-Ring	230×5.3	1		
64	GB/T 16866	Copper pipe	ϕ10×1	1		
63	GB/T 16866	Copper pipe	ϕ8×1	1		

No.	Code	Name	Specification	Qty.	Materials	Remarks
62	GB/T 16866	Copper pipe	ϕ8×1	1		
61	GB/T 16866	Copper pipe	ϕ8×1	1		
60	GB/T 16866	Copper pipe	ϕ8×1	1		
59	GB/T 276	Deep groove ball bearing	6218	1		
58	GB/T 288	Self-aligning roller bearing	22314	1		
57	GB/T 292	Angular contact ball bearing	7318B	2		
56	GB/T 292	Angular contact ball bearing	7314B	1		
55	GB/T 6173	Hex nut	M22×1.5	1		
54	GB/T 6170	Hex nut	M6	4		
53	GB/T 858	Lock washer	64	1		
52	GB/T 858	Lock washer	55	1		
51	GB/T 858	Lock washer	52	1		
50	GB/T 812	Round nut	M64×2LH	1		
49	GB/T 812	Round nut	M55×2LH	1		
48	GB/T 812	Round nut	M52×1.5	1		
47	GB/T 93	Spring washer	8	22		
46	GB/T 93	Spring washer	10	12		
45	GB/T 93	Spring washer	6	12		
44	GB/T 97.1	Flat washer	6	12		
43	GB/T 5783	Hexagon bolt	M8×30	10		
42	GB/T 5783	Hexagon bolt	M10×30	6		
41	GB/T 5783	Hexagon bolt	M10×40	6		
40	GB/T 5783	Hexagon bolt	M6×30	4		
39	GB/T 5783	Hexagon bolt	M6×20	6		
38	GB/T 70.1	Hexagon socket cap screw	M8×50	2		
37	GB/T 70.1	Hexagon socket cap screw	M8×20	10		
36	GB/T 70.1	Hexagon socket cap screw	M6×12	6		
35	GB/T 26120 P1	Plug	1/2"	1		
34	GB/T 26120 P1	Plug	1/4"	1		
33	JB/T 7941.2	Oil leveler	A20	1		
32	GB/T 825	Lifting bolt	M10B	2		
31	GB/T 5783	Hexagon bolt	M6×16	4		
30	GB/T 1567	Key	B25×9×55	1		
29	GB/T 1567	Key	B25×9×80	1		
28	GB/T 1096	Key	B20×12×80	1		
27	ZJCLX-PJA-A 15.875×15.875×95.25	Key		1		
26	ZJCLX-TQM-ϕ30×M22×25	Vent cap		1		
25	ZJCLX-YZX-ϕ25×50	Cylinder pin		2		
24	ZJCLX-GTXXJ-9.53×40	Hook key		1		
23	ZJCLX-GCGG-ϕ155×ϕ105×16	Window cover		1		
22	ZJCLX-GCC-ϕ125×3.5	Inspection window		1		
21	H250-073	Clamp ring		1		
20	H250-048	Dust cover		1		
19	H250-031-2	Splint		2		
18	H250-031-1	Splint		2		
17	H250-029	Oil seal housing		1		
16	H250-022	Ratchet wheel		1		
15	H250-020	Bearing gland		1		
14	H250-018	Baseboard		1		
13	H250-017	Screw oil pump wheel		1		
12	H250-016(1.1)	Driven gear		1		
11	H250-015	Bush		1		
10	H250-014	Thrust metal		1		
9	H250-013	Inertia wheel		1		
8	H250-012	Non-reverse coupling		1		
7	H250-011(1.1)	Output shaft		1		
6	H250-008	Bearing carrier		1		
5	H250-007	Adjusting washer		1		
4	H250-006	Bearing gland		1		
3	H250-003(1.1)	Driving gear		1		
2	H250-002(1.1)	Input shaft		1		
1	H250-001	Box		1		

MARK	QTY	CHANGED FILE NO.	SIGN	DATE

DWN		DATE	
PRF		DATE	
CHD		DATE	
REVD		DATE	2023/2/27

PART No.: A
G250-00 (1:1)

MATERIAL :

PROJECT :

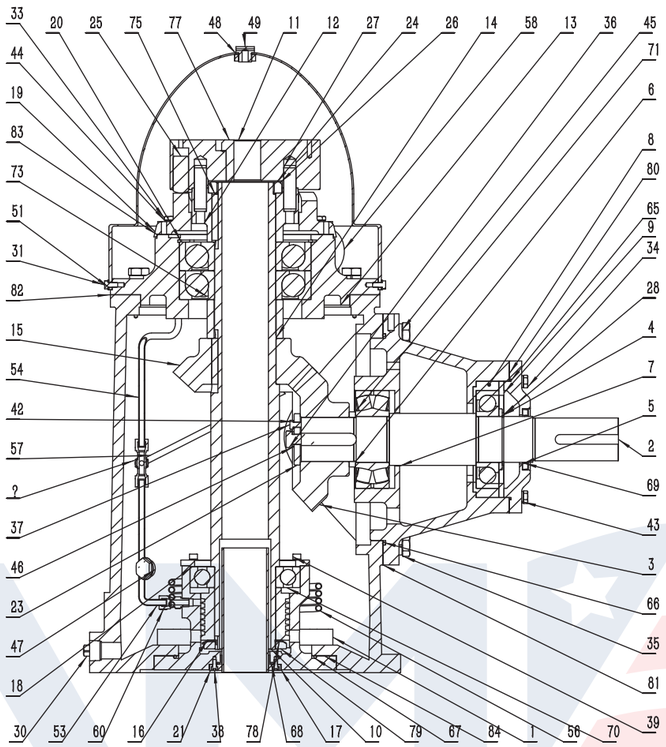
NAME :
GEAR DRIVE ASSEMBLY

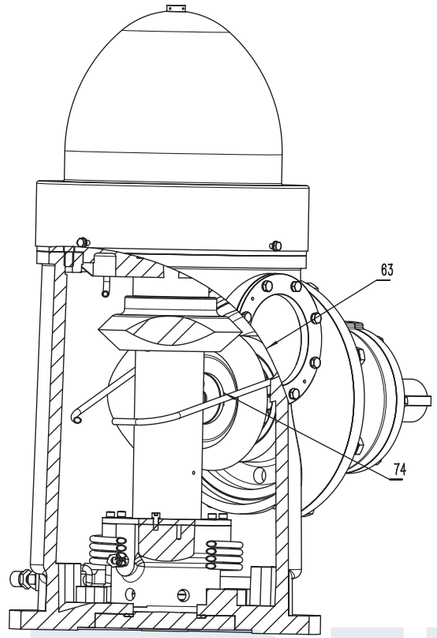
MARK	WT	SCALE
		1:6

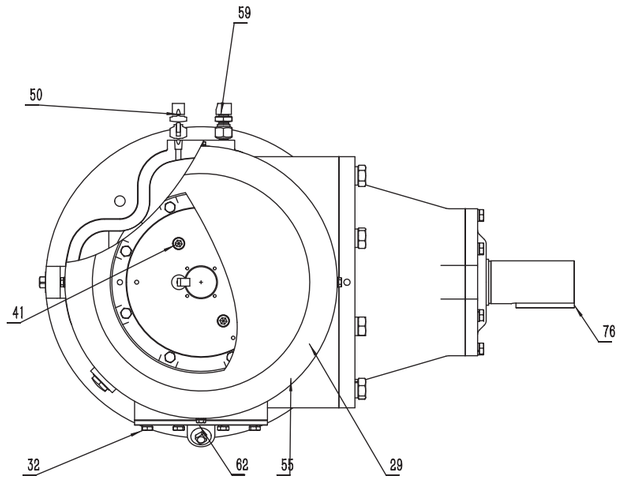
SHT OF

AMERIFLO

REV 2023A







No.	Code	Name	Specification	Qty.	Materials	Remarks
81	Q/AN3151.1 E10	Straight pipe joint	3/8"	2		
80	GB/T 3746	Jacketed four-way joint	L8	1		
79	GB/T 3734	Straight pipe joint	L8/R1/4	1		
78		Paper washer	ϕ335×ϕ250	1		
77		Paper washer	ϕ280×ϕ225	1		
76		Paper washer	ϕ240×ϕ172	1		
75		Paper washer	ϕ215×ϕ170	1		
74		Paper washer	ϕ160×ϕ120	1		
73		Paper washer	ϕ155×ϕ125	1		
72	GB/T 119.2	Cylinder pin	12×32	2		
71	GB/T 119.2	Cylinder pin	3×18	1		
70	GB/T 13871.1	Lip-seal	FB75×100×10	1		
69	GB/T 3452.1	O-Ring	118×3.55	1		
68	GB/T 3452.1	O-Ring	54.5×3.55	1		
67	GB/T 3452.1	O-Ring	175×3.55	1		
66	GB/T 3452.1	O-Ring	122×3.55	1		
65	GB/T 3452.1	O-Ring	230×5.3	1		
64	GB/T 16866	Copper pipe	ϕ10×1	1		
63	GB/T 16866	Copper pipe	ϕ8×1	1		

No.	Code	Name	Specification	Qty.	Materials	Remarks
62	GB/T 16866	Copper pipe	ϕ8×1	1		
61	GB/T 16866	Copper pipe	ϕ8×1	1		
60	GB/T 16866	Copper pipe	ϕ8×1	1		
59	GB/T 276	Deep groove ball bearing	6220	1		
58	GB/T 288	Self-aligning roller bearing	22315	1		
57	GB/T 292	Angular contact ball bearing	7320B	2		
56	GB/T 292	Angular contact ball bearing	7315B	1		
55	GB/T 6173	Hex nut	M22×1.5	1		
54	GB/T 6170	Hex nut	M6	4		
53	GB/T 858	Lock washer	64	1		
52	GB/T 858	Lock washer	55	1		
51	GB/T 858	Lock washer	52	1		
50	GB/T 812	Round nut	M64×2LH	1		
49	GB/T 812	Round nut	M55×2LH	1		
48	GB/T 812	Round nut	M52×1.5	1		
47	GB/T 93	Spring washer	8	22		
46	GB/T 93	Spring washer	10	12		
45	GB/T 93	Spring washer	6	12		
44	GB/T 97.1	Flat washer	6	12		
43	GB/T 5783	Hexagon bolt	M8×30	10		
42	GB/T 5783	Hexagon bolt	M10×30	6		
41	GB/T 5783	Hexagon bolt	M10×40	6		
40	GB/T 5783	Hexagon bolt	M6×30	4		
39	GB/T 5783	Hexagon bolt	M6×20	6		
38	GB/T 70.1	Hexagon socket cap screw	M8×50	2		
37	GB/T 70.1	Hexagon socket cap screw	M8×20	10		
36	GB/T 70.1	Hexagon socket cap screw	M6×12	6		
35	GB/T 26120 P1	Plug	1/2"	1		
34	GB/T 26120 P1	Plug	1/4"	1		
33	JB/T 7941.2	Oil leveler	A20	1		
32	GB/T 825	Lifting bolt	M10B	2		
31	GB/T 5783	Hexagon bolt	M6×16	4		
30	GB/T 1567	Key	B28×10×75	2		
29	GB/T 1567	Key	B25×9×80	1		
28	GB/T 1096	Key	B20×12×80	1		
27	ZJCLX-PJA-A 15.875×15.875×95.25	Key		1		
26	ZJCLX-TQM-ϕ30×M22×25	Vent cap		1		
25	ZJCLX-YZX-ϕ25×50	Cylinder pin		2		
24	ZJCLX-GTXXJ-9.53×40	Hook key		1		
23	ZJCLX-QCCG-ϕ155×ϕ105×16	Window cover		1		
22	ZJCLX-QCC-ϕ125×3.5	Inspection window		1		
21	H350-073	Clamp ring		1		
20	H350-048	Dust cover		1		
19	H350-031-2	Splint		2		
18	H350-031-1	Splint		2		
17	H350-029	Oil seal housing		1		
16	H350-022	Ratchet wheel		1		
15	H350-020	Bearing gland		1		
14	H350-018	Baseboard		1		
13	H350-017	Screw oil pump wheel		1		
12	H350-016(1:1)	Driven gear		1		
11	H350-015	Bush		1		
10	H350-014	Thrust metal		1		
9	H350-013	Inertia wheel		1		
8	H350-012	Non-reverse coupling		1		
7	H350-011(1:1)	Output shaft		1		
6	H350-008	Bearing carrier		1		
5	H350-007	Adjusting washer		1		
4	H350-006	Bearing gland		1		
3	H350-003(1:1)	Driving gear		1		
2	H350-002(1:1)	Input shaft		1		
1	H350-001	Box		1		

MARK	QTY	CHANGED FILE NO.	SIGN	DATE
DWN				DATE
PRF				DATE
CHD				DATE
REVD				DATE 2023/2/27

PART No.: A
G350-00 (1:1)

MATERIAL :

PROJECT :

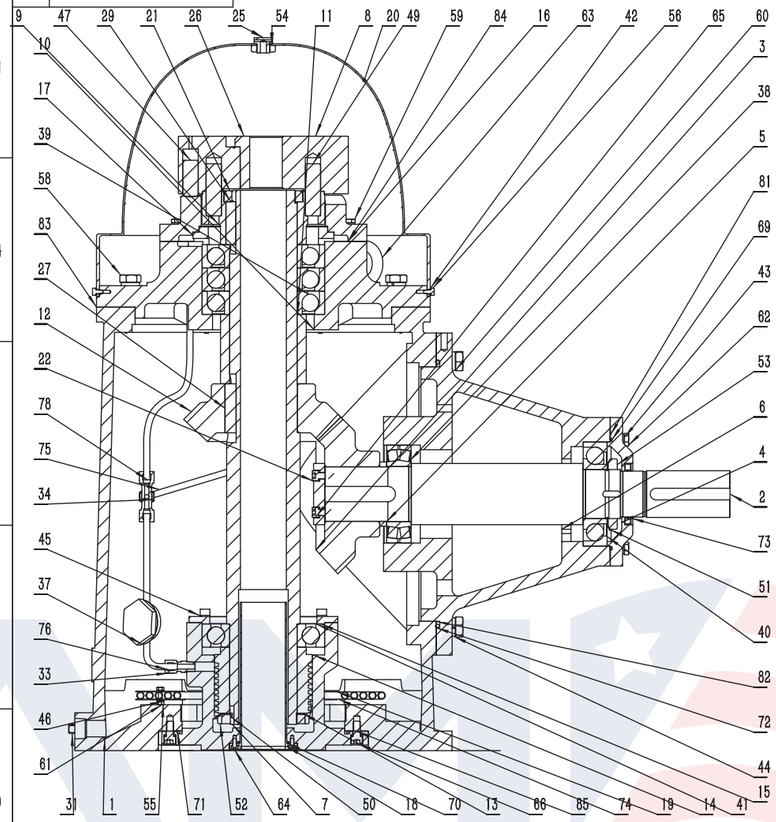
NAME :
GEAR DRIVE ASSEMBLY

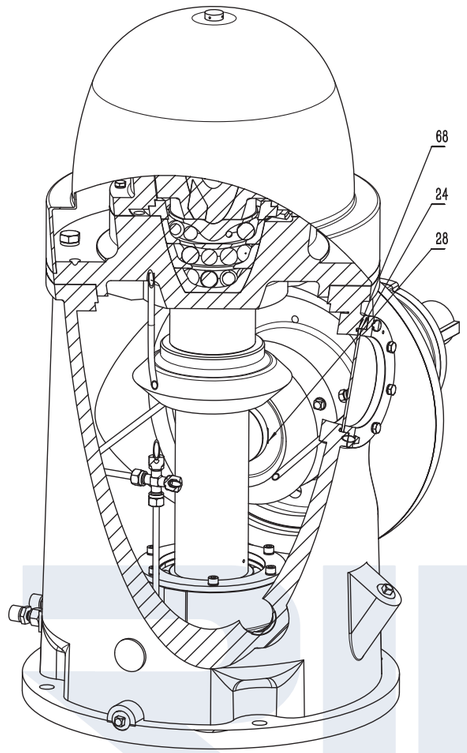
MARK	WT	SCALE
		1:6

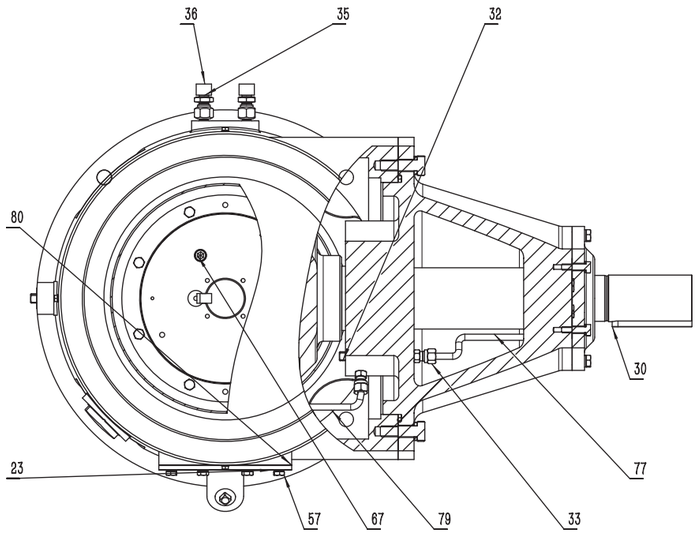
SHT OF

AMERIFLO

REV 2023A







82	GB/T 16866	Copper pipe	ϕ8×1	1		
81	GB/T 16866	Copper pipe	ϕ8×1	1		
80	GB/T 16866	Copper pipe	ϕ8×1	1		
59	GB/T 276	Deep groove ball bearing	6222	1		
58	GB/T 288	Self-aligning roller bearing	22216	1		
57	GB/T 292	Angular contact ball bearing	7222B	3		
56	GB/T 292	Angular contact ball bearing	7316B	1		
55	GB/T 6173	Hex nut	M22×1.5	1		
54	GB/T 6170	Hex nut	M6	4		
53	GB/T 858	Lock washer	64	1		
52	GB/T 858	Lock washer	55	1		
51	GB/T 858	Lock washer	52	1		
50	GB/T 812	Round nut	M64×2LH	1		
49	GB/T 812	Round nut	M55×2LH	1		
48	GB/T 812	Round nut	M52×1.5	1		
47	GB/T 93	Spring washer	6	22		
46	GB/T 93	Spring washer	10	12		
45	GB/T 93	Spring washer	6	12		
44	GB/T 97.1	Flat washer	6	12		
43	GB/T 5783	Hexagon bolt	M8×30	10		
42	GB/T 5783	Hexagon bolt	M10×30	6		
41	GB/T 5783	Hexagon bolt	M10×40	6		
40	GB/T 5783	Hexagon bolt	M8×30	4		
39	GB/T 5783	Hexagon bolt	M8×20	6		
38	GB/T 70.1	Hexagon socket cap screw	M8×50	2		
37	GB/T 70.1	Hexagon socket cap screw	M8×20	10		
36	GB/T 70.1	Hexagon socket cap screw	M8×12	6		
35	GB/T 28120 P1	Plug	1/2"	1		
34	GB/T 28120 P1	Plug	1/4"	1		
33	JB/T 7941.2	Oil leveler	A20	1		
32	GB/T 825	Lifting bolt	M10B	2		
31	GB/T 5783	Hexagon bolt	M8×16	4		
30	GB/T 1567	Key	B28×16×70	1		
29	GB/T 1567	Key	B25×14×90	1		
28	GB/T 1096	Key	B32×18×80	1		
27	ZJCLX-PJA-A 15.875×15.875×85.85	Key		1		
26	ZJCLX-TQM-ϕ30×M22×25	Vent cap		1		
25	ZJCLX-YZX-ϕ25×50	Cylinder pin		2		
24	ZJCLX-GTXXJ-9.53×40	Hook key		1		
23	ZJCLX-QCCQ-ϕ155×ϕ105×16	Window cover		1		
22	ZJCLX-CCC-ϕ125×3.5	Inspection window		1		
21	H500-073	Clamp ring		1		
20	H500-048	Dust cover		1		
19	H500-031-2	Splint		2		
18	H500-031-1	Splint		2		
17	H500-029	Oil seal housing		1		
16	H500-022	Ratchet wheel		1		
15	H500-020	Bearing gland		1		
14	H500-018	Baseboard		1		
13	H500-017	Screw oil pump wheel		1		
12	H500-016(1.1)	Driven gear		1		
11	H500-015	Bush		1		
10	H500-014	Thrust metal		1		
9	H500-013	Inertia wheel		1		
8	H500-012	Non-reverse coupling		1		
7	H500-011(1.1)	Output shaft		1		
6	H500-008	Bearing carrier		1		
5	H500-007	Adjusting washer		1		
4	H500-006	Bearing gland		1		
3	H500-003(1.1)	Driving gear		1		
2	H500-002(1.1)	Input shaft		1		
1	H500-001	Box		1		
No.	Code	Name	Specification	Qty.	Materials	Remarks

81	Q/AN3151.1 E10	Straight pipe joint	3/8"	2		
80	GB/T 3746	Jacketed four-way joint	L8	1		
79	GB/T 3734	Straight pipe joint	L6/R1/4	1		
78		Paper washer	ϕ335×ϕ250	1		
77		Paper washer	ϕ280×ϕ225	1		
76		Paper washer	ϕ240×ϕ172	1		
75		Paper washer	ϕ215×ϕ170	1		
74		Paper washer	ϕ160×ϕ120	1		
73		Paper washer	ϕ155×ϕ125	1		
72	GB/T 119.2	Cylinder pin	12×32	2		
71	GB/T 119.2	Cylinder pin	3×18	1		
70	GB/T 13871.1	Lip-seal	FB70×95×10	1		
69	GB/T 3452.1	O-Ring	118×3.55	1		
68	GB/T 3452.1	O-Ring	54.5×3.55	1		
67	GB/T 3452.1	O-Ring	175×3.55	1		
66	GB/T 3452.1	O-Ring	122×3.55	1		
65	GB/T 3452.1	O-Ring	230×5.3	1		
64	GB/T 16866	Copper pipe	ϕ10×1	1		
63	GB/T 16866	Copper pipe	ϕ8×1	1		
No.	Code	Name	Specification	Qty.	Materials	Remarks

MARK	QTY	CHANGED FILE NO.	SIGN	DATE
DWN			DATE	
PRF			DATE	
CHD			DATE	
REVD			DATE	2023/2/27

PART No.: G500-00 (1:1) | A | PROJECT:

MATERIAL:

NAME: GEAR DRIVE ASSEMBLY

MARK	WT	SCALE
		1:6

SHT OF

AMERIFLO

PRESTART-UP CHECKLIST

AMERIFLO REPRESENTATIVE: _____ REP PHONE NUMBER: _____
CONTRACTOR: _____ CONTRACTOR PHONE NUMBER: _____
PROJECT ENGINEER: _____ ENGINEER PHONE NUMBER: _____
PROJECT NAME: _____ PUMP LOCATION: _____

EQUIPMENT INFORMATION

PUMP MODEL: _____ PUMP S/N: _____ HS: ☐
MOTOR MODEL: _____ MOTOR S/N: _____
ENGINE MODEL: _____ ENGINE S/N: _____
GEAR MODEL: _____ GEAR S/N: _____

PROCEDURE	YES	NO	N/A	COMMENTS
1. SHIPMENT				
WAS THERE ANY DAMAGE DURING SHIPMENT?	☐	☐	☐	
WERE ALL ORDERED ITEMS RECEIVED?	☐	☐	☐	
2. STORAGE				
HAS EQUIPMENT BEEN PROTECTED FROM THE WEATHER?	☐	☐	☐	
WAS EQUIPMENT SUBJECT TO DAMAGE IN STORAGE?	☐	☐	☐	
HAVE ALL BEARINGS BEEN PROTECTED FROM MOISTURE?	☐	☐	☐	
3. INSTALLATION				
IOM MANUAL COMPLETELY READ AND UNDERSTOOD?	☐	☐	☐	
WERE FASTENERS USED IN SHIPPING AND REMOVED PRIOR TO INSTALLATION?	☐	☐	☐	
IS GROUTING UNDER BASE PROPERLY COMPACTED?	☐	☐	☐	
IS GROUT OF THE NON-SHRINK TYPE?	☐	☐	☐	
HAVE PROPER ANCHOR BOLTS BEEN USED?	☐	☐	☐	
HAVE SUCTION AND DISCHARGE PIPING BEEN CHECKED FOR THE PRESENCE OF PIPE STRAIN?	☐	☐	☐	
ARE LUBRICATION LINES AND COOLING LINES CONNECTED PROPERLY?	☐	☐	☐	
ARE ACCESSORIES MOUNTED AND PROPERLY INSTALLED?	☐	☐	☐	
ARE ALL SAFETY GUARDS INSTALLED PROPERLY?	☐	☐	☐	
HAVE IMPELLERS BEEN CHECKED FOR PROPER CLEARANCE?	☐	☐	☐	
IS ALL WIRING CONNECTED PROPERLY AND CHECKED FOR VOLTAGE, PHASE, FREQUENCY, ETC.?	☐	☐	☐	
4. ALIGNMENT				
HAS THE PUMP & DRIVER ALIGNMENT BEEN CHECKED?	☐	☐	☐	
HAVE INDICATOR READINGS BEEN TAKEN?	☐	☐	☐	
5. ROTATION				
HAS THE DRIVER ROTATION BEEN CHECKED?	☐	☐	☐	
COUPLING & SHAFT TURNED AND FREE TO ROTATE?	☐	☐	☐	
6. SYSTEM				
IS THE SYSTEM FREE OF FOREIGN DEBRIS?	☐	☐	☐	
IS LIQUID PRESENT IN SYSTEM?	☐	☐	☐	
ALL SYSTEM PIPING IS PROPERLY SUPPORTED?	☐	☐	☐	
ARE THE PUMPS AND CONTROLS ACCESSIBLE AND UNLOCKED?	☐	☐	☐	

CUSTOMER'S REPRESENTATIVE WITNESSING START-UP		AMERIFLO REPRESENTATIVE WITNESSING START-UP:	
NAME:	DATE:	NAME:	DATE:

START-UP CHECKLIST

AMERIFLO REPRESENTATIVE: _____ REP PHONE NUMBER: _____
CONTRACTOR: _____ CONTRACTOR PHONE NUMBER: _____
PROJECT ENGINEER: _____ ENGINEER PHONE NUMBER: _____
PROJECT NAME: _____ PUMP LOCATION: _____

EQUIPMENT INFORMATION

PUMP MODEL: _____ PUMP S/N: _____ HS: ☐
MOTOR MODEL: _____ MOTOR S/N: _____
ENGINE MODEL: _____ ENGINE S/N: _____
GEAR MODEL: _____ GEAR S/N: _____

DESIGN CONDITIONS

FLOW: _____ RPM: _____ VOLTAGE: _____
PRESSURE: _____ HP: _____ PHASE: _____

PROCEDURE	YES	NO	N/A	COMMENTS
1. PRESTART-UP				
HAS THE PROCEDURE CHECKLIST FOR PRE-START-UP BEEN COMPLETED?	☐	☐	☐	
VERIFY PUMP ROTATION:				☐ CW ☐ CCW (AS VIEWED FROM THE MOTOR)
VERIFY DRIVER ROTATION:				☐ CW ☐ CCW (AS VIEWED FROM THE MOTOR)
2. IMPELLER CLEARANCE SETTING				
HAS IMPELLER BEEN PROPERLY ADJUSTED?	☐	☐	☐	
VTP AXIAL IMPELLER CLEARANCE: _____ IN				
3. LUBRICATION				
HAVE THE BEARINGS BEEN PROPERLY LUBRICATED?	☐	☐	☐	
HAS THE COUPLING BEEN PROPERLY LUBRICATED?	☐	☐	☐	
HAS THE MOTOR BEEN PROPERLY LUBRICATED?	☐	☐	☐	
DIESEL ENGINE COOLANT LEVEL CHECKED?	☐	☐	☐	
DIESEL ENGINE OIL LEVEL CHECKED?	☐	☐	☐	
DIESEL ENGINE FUEL LEVEL CHECKED?	☐	☐	☐	
4. SYSTEM				
HAS FLOW BEEN ESTABLISHED?	☐	☐	☐	
HAVE GAUGE READINGS BEEN TAKEN?	☐	☐	☐	
EXCESSIVE VIBRATION PRESENT?	☐	☐	☐	
BEARING TEMPERATURE NORMAL?	☐	☐	☐	
ENGINE TEMPERATURE NORMAL?	☐	☐	☐	
5. PACKING				
PACKING BROKEN IN CORRECTLY?	☐	☐	☐	
PACKING LEAKAGE IS ACCEPTABLE AFTER BREAK-IN PERIOD?	☐	☐	☐	

CUSTOMER'S REPRESENTATIVE WITNESSING START-UP:		AMERIFLO REPRESENTATIVE WITNESSING START-UP:	
NAME:	DATE:	NAME:	DATE:

FIELD TEST REPORT

AMERIFLO REPRESENTATIVE: _____ REP PHONE NUMBER: _____
CONTRACTOR: _____ CONTRACTOR PHONE NUMBER: _____
PROJECT ENGINEER: _____ ENGINEER PHONE NUMBER: _____
PROJECT NAME: _____ PUMP LOCATION: _____

EQUIPMENT INFORMATION

PUMP MODEL: _____ PUMP S/N: _____ HS: ☐
MOTOR MODEL: _____ MOTOR S/N: _____
ENGINE MODEL: _____ ENGINE S/N: _____
GEAR MODEL: _____ GEAR S/N: _____

DESIGN CONDITIONS

FLOW: _____ RPM: _____ VOLTAGE: _____
PRESSURE: _____ HP: _____ PHASE: _____

PROCEDURE	YES	NO	N/A	COMMENTS
1. PRESTART-UP				
HAS THE PROCEDURE CHECKLIST FOR PRE-START-UP BEEN COMPLETED?	☐	☐	☐	
2. START-UP				
HAS THE PROCEDURE CHECKLIST FOR START-UP BEEN COMPLETED?	☐	☐	☐	
3. SYSTEM				
SUCTION VALVE OPEN?	☐	☐	☐	
SUMP LIQUID LEVEL CORRECT?	☐	☐	☐	
SUMP CLEAR OF DEBRIS?	☐	☐	☐	
ARE ALL SYSTEM VALVES IN THE CORRECT POSITION?	☐	☐	☐	
IS ALL PIPING SECURE AND FLOW PROPERLY ROUTED?	☐	☐	☐	

4. RECORDED DATA	POINT 1	POINT 2	POINT 3	POINT 4	POINT 5
SPEED (RPM):					
FLOW (GPM):					
DISCHARGE PRESSURE (PSIG):					
SUCTION PRESSURE (PSIG):					
LIFT (WATER LEVEL TO DISCHARGE CENTERLINE) (FEET):					
INPUT POWER (KW):					
CURRENT (AMPS):					
VOLTAGE (VOLTS):					
ESTIMATED FRICTION LOSS TO DISCHARGE GAUGE (FEET):					
MOTOR EFFICIENCY:					

5. CALCULATED DATA	POINT 1	POINT 2	POINT 3	POINT 4	POINT 5
TOTAL DYNAMIC HEAD (TDH):					
PUMP BHP (KW x MOTOR EFFICIENCY / 0.746):					
PUMP EFFICIENCY (TDH x SG x GPM) / BHP x 3960):					

CUSTOMER'S REPRESENTATIVE WITNESSING START-UP:		AMERIFLO REPRESENTATIVE WITNESSING START-UP:	
NAME:	DATE:	NAME:	DATE: