Procedure for Long-Term Storage of CYCLO DRIVE, BEIER VARIATOR, and BEIER-CYCLO VARIATOR

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1. Notes on Using This Manual

Rust prevention treatment is necessary before storage of CYCLO DRIVES, BEIER VARIATORS, and BEIER-CYCLO VARIATORS for an extended period of time. This manual describes rust prevention treatments for before and after shipment for different time periods of storage. This manual determines rust prevention treatments limited to conditions provided below, because rust prevention treatment depends not only on storage period but also on the ambient environment and storage method. Consequently, if storage environment do not match the conditions described, additional examination is required.

<Storage conditions——Environment and Storage Method>

Storage area should be free of humidity, dust, severe change in temperature, and corrosive gas. CYCLO DRIVES, BEIER VARIATORS, and BEIER-CYCLO VARIATORS should be stored indoors, in an ordinary factory or a warehouse. Unit should be wrapped in plastic sheets to close off ventilation, and should be packed with absorbent. Unit should be kept in sealed container and absorbent should be replaced periodically to keep the inside of box dry.

2. Rust Prevention for Assembled Unit

The following describes rust prevention treatment for exterior and interior of the unit.

(1) External Rust Prevention

1) Machine Processed Surface

1. Standard Rust Prevention Specification

Treatment of table below is applied at the time of shipping. Check at least once in 6 month after shipping for NP-2 rust prevention oil coat types, and check at least once a year for NP-19 rust prevention oil. If necessary, reapply rust prevention treatment. Also for units, which require rust prevention treatment at least once a year, with NP-2 rust prevention oil coat, indication of specification code “A28” for export rust prevention is necessary.

Frame size of Model / Parts	CYCLO & CYCLO VARIATOR		BEIER	
	6060~6125	6130~6275	E Series	N05~150, ND
Shaft and flange attachment surface	NP-2 Rust prevention oil application	NP-19 Rust prevention oil application	NP-2 Rust prevention oil application	NP-19 Rust prevention oil application
Attachment surface of foot	Final coating Applied once	Same as in left	Same as in left	Same as in left

NP-2
Daphne Evercoat No.2
Rust prevention time period:
6 months after shipping

NP-19
RUSTVETO 342
Rust prevention time period:
1 year after shipping

2 Rust Prevention Specification for Export

When export specification code, “A28” is indicated, treatment of the table below is applied. Investigate rust prevention condition at least once a year and reapply rust prevention treatment if necessary.

Frame size of Model / Parts	CYCLO & CYCLO VARIATOR		BEIER	
	6060~6125	6130~6275	E Series	N05~150, ND
Shaft and flange attachment surface	NP-19 Rust prevention oil application	Same as in left	Same as in left	Same as in left
Shaft end screw hole	P-11 Rust prevention oil application	Same as in left	Same as in left	Same as in left
Attachment surface of foot	NP-1 Rust prevention oil application	Same as in left	Same as in left	Same as in left

NP-19
Lastbest 342
Rust prevention time period:
1 year after shipping

NP-11 (MIL Standard)
APOLLOIL AUTOLEX A
Rust prevention time period:
1 year after shipping

NP-1
Daphne Evercoat No.1
Rust prevention time period:
1 year after shipping

2) Coating Surface

Check coat condition at least once a year after shipping. If any coat damage is found, sand rust with sand paper and such, and repair by applying same undercoat and overcoat as the previous coat.

(2) Rust Prevention Treatment for Interior Surfaces

1) Oil-lubricated models

	Sumitomo Standard		Sumitomo Recommendation
Storage time period	Within 6 months	6 to 12 months	Over 12 months
Instructions when order is placed	No instructions necessary	Instructions of rust prevention for export models are necessary (Specification code A28)	Same as in left
Rust prevention treatment applied before shipment from factory	Unit is treated with rust preventive oil NP-10, operated without load, then have oil drained before shipment	Unit is treated with rust preventive oil NP-10, operated without load, then have oil drained. Rust preventive oil NP-20 is sprayed inside the unit, and the air flow opening is tightly taped up or closed with a polyethylene bag	Same as in left
Measures to be taken by the customer after delivery	Operation of the unit every two or three months after delivery using a lubricant, recommended or specified by Sumitomo, is recommended.	Not necessary	Fill Shell VSI Circulating oil 100 to 5 % of required lubricating oil volume and tightly close air flow opening again one year after delivery. For extended storage, change Shell VSI Circulating Oil every year

Remarks	1. Storage time period starts at the time when the unit is shipped from factory. 2. Sumitomo is uses following rust preventive oils. (These brands are subject to change without notice.) NP-10: Esso JWS 2116K or Shell Ensis Engine Oil 30 NP-20: Shell VSI Circulating Oil 100 Do not mix rust preventive oil with other brands of oil. 3. Care should be taken not to allow rust preventive oil NP-20 to flow toward motor during transit or mounting. 4. Before starting operation, drain rust preventive oil NP-20 and flush with designated lubricant. 5. Do not use rust preventive oil NP-20 for operation with load.

2) Grease-lubricated models

	Sumitomo Standard	Sumitomo Recommendation
Storage time period	Within 1 year	1 to 3 years
Instructions when order is placed	No instructions necessary	Same as described in the left column
Rust prevention treatment applied before shipment from factory	The unit is filled with standard grease and operated without load before shipment.	Same as described in the left column
Measures to be taken by customers after delivery	Not necessary	Disassemble the unit and change grease. If this is impossible, replenish with sufficient grease before starting operation. (Refer to the instruction manual.) For maintenance-free units, conduct test run of the unit with grease filler plug removed, discharge excess grease, and put plug back in place.
Remarks	1. Storage time period begins from the time when unit is shipped from factory. 2. Change grease if the unit is used for over three years. If this is impossible, replenish with sufficient grease before starting operation. Whenever excessive noise, vibration, or heat generation occurs, immediately stop the unit, disassemble, and inspect it carefully. Make sure there are no defects and replace the grease again.	

(3) Treatment of Non-Metallic Parts

Non-metallic parts such as oil seals, oil gauges, and oil filler plugs are likely to degrade when affected by ambient conditions such as temperature and ultraviolet rays. Inspect the unit carefully before starting operation after storing for an extended period of time. Replace all degraded parts with new ones.

3. Rust Prevention Treatment for Parts

The following table describes rust prevention treatment for the orders made by parts.

	Sumitomo Standard		Sumitomo Recommendation
Storage time period	Within 6 months	6 to 12 months	Over 12 months
Instructions when the order is placed	No instructions necessary	Instructions of rust prevention for export model are needed	Same as in left
Rust prevention treatment applied before shipment from factory.	The unit is treated with rust preventive oil NP-10 and packed in a polyethylene bag.	The unit is treated with rust preventive oil NP-10 and put in a polyethylene bag. Rust preventive oil NP-20 is sprayed inside the bag and the bag is closed for packing.	Same as in left
Measures to be taken by the customer after delivery	Not necessary	Not necessary	One year after delivery, check the status of rust prevention treatment. Spray Shell VSI Circulating Oil 100 into the polyethylene bag. Spray again every year thereafter.
Remarks	1. The storage time period starts from when the unit is shipped from the factory. 2. Sumitomo is using rust preventive oils below. However, these brands are subject to change without notice. NP-10: Esso JWS 2116K or Shell Ensis Engine Oil 30 NP-20: Shell VSI Circulating Oil 100 Do not mix rust preventive oil with other brands of oil. 3. Before assembling parts, flush rust preventive oil completely with light oil or designated lubricant. 4. External parts such as casings may be treated with rust preventive oil NP-1 (Idemitsu Daphne Evercoat No. 1) or rust preventive oil NP-2 (Non Luster P261, P211 of Yushiro Chemical Industry Co., Ltd.), instead of rust preventive oil NP-10, and shipped. Check the status of rust prevention treatment every year after delivery. Provide rust prevention treatment if necessary.		

4. Motor Storage Procedures

The following describes the procedure for storing AC motors for CYCLO DRIVE, BEIER VARIATOR and CYCLO-BEIER VARIATOR, FB brake, and PMB brake. Storage conditions must conform to rust prevention for assembled unit.

(1) Storage of AC motors for CYCLO DRIVE, BEIER VARIATOR and CYCLO-BEIER VARIATOR

1) Insulation Resistance

Measure insulation resistance before starting motor. Measurements should conform to the following.

Low voltage: 600 V or less, 1M ohm and above

High voltage: 3300V, 5M ohm and above

If the measured insulation resistance is less than the above value, disassemble the motor and dry it with hot air to restore insulation resistance.

2) Grease for Bearings

After three years since shipment from Sumitomo factory, shielded bearings should be replaced with new ones. Change grease for open bearings. If these processes are impossible, new grease should be replenished through grease nipple immediately when test run starts, while old grease is allowed to flow out from drain plug. If grease and bearings have not been replaced when operation started, carefully observe temperature rise, bearing noise, and vibration. If any abnormality is found, operation should be stopped immediately and bearings should be replaced.

3) Rust Prevention Treatment for Exterior Surfaces

Provide same rust prevention treatment as exterior surfaces of assembled unit.

(2) Storage of Motor Accompanied by FB Brakes

1) Rust Prevention Treatment for Machined Surfaces

Machined surfaces of parts such as iron cores require rust prevention treatment. Sumitomo should be consulted for details of rust prevention treatment for such parts.

2) Insulation Resistance (Electromagnet)

Same measures as storage of AC Motors should be taken. Standard of resistance is as follows.

Low voltage: 600 V or less, 1M ohm and above

3) Inspection Before Operation

Supply power prior to starting operation and make sure brake operates normally.

4) Painted Surfaces

Check the conditions of painted surfaces at least once a year after delivery. If paint has come off, remove any rust with sandpaper and apply same undercoat and overcoat as before.

(3) Storage of Motor Accompanied by CMB Brakes

1) Rust Prevention Treatment for Machined Surfaces

Machines surfaces of parts such as brake wheels and iron cores require rust prevention treatment. Consult Sumitomo for details of rust prevention treatment for such parts.

2) Insulation Resistance (Electromagnet)

Take same measures as storage of AC motor.

3) Insulation Before Starting Operation

Supply power before starting operation and make sure that brake operates normally.

4) Painted Surfaces

Take same measures as painted surface of storage of motor accompanied by FB brakes.

(4) Storage of PMB Brake

1) Rust Prevention Treatment for Machined Surfaces

Machined surfaces of moving parts such as brake wheels, rods, and pins require rust prevention treatment. Consult Sumitomo for details of rust prevention treatment for such parts.

2) Insulation Resistance (Electromagnet)

Take same measures as storage of AC motor.

3) Inspection Before Starting Operation

Supply power before starting operation and make sure that brake operates normally.

4) Painted Surfaces

Take the same measures as painted surface of storage of motor accompanied by FB brakes.