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- TPSGC
11 Laurier St. / 11, rue Laurier
Place du Portage , Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Ship Refits and Conversions / Radoubss et
modifications de navires and / et
11 Laurier St. / 11, rue Laurier
6C2, Place du Portage
Gatineau, Québec K1A 0S5

Title - Sujet CCGS Limnos Dry Docking	
Solicitation No. - N° de l'invitation F2599-145092/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client F2599-145092	Date 2015-03-09
GETS Reference No. - N° de référence de SEAG PW-\$\$\$MD-030-25006	
File No. - N° de dossier 030md.F2599-145092	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-04-16	Time Zone Fuseau horaire Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Cook, Kristin	Buyer Id - Id de l'acheteur 030md
Telephone No. - N° de téléphone (819) 956-1397 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation

F2599-145092/A

Amd. No. - N° de la modif.

002

Buyer ID - Id de l'acheteur

030md

Client Ref. No. - N° de réf. du client

F2599-145092

File No. - N° du dossier

030mdF2599-145092

CCC No./N° CCC - FMS No/ N° VME

The following changes in the bid documents are effective immediately. This amendment will form part of the contract documents. All other terms and conditions remain unchanged.

1) DELETE ANNEX G – Appendix 1 – PRICING DATA SHEET in its entirety

and;

REPACE WITH **ANNEX G – Appendix 1 – PRICING DATA SHEET, *Revised 1***, herein.

2) ADD **Anchor Windlass Manual**, attached.

ANNEX G - Appendix 1 - PRICING DATA SHEET, Revised 1

Ref #	Spec #	Description	Total Hours	Total Labour Cost (\$)	Total Material Cost (\$)	Total FSR & Sub-Contractor cost	Total Firm Price (\$)	Unit Cost (\$)
2.0		SERVICES		\$	\$	\$	\$	
	2.5	Unit Rate/Kw Hr for consumption						\$
	2.7	Unit Rate/Hr for Crane Supply						\$
5.0		FIELD SERVICE REPRESENTATIVE REQUIREMENTS		\$	\$	\$	\$	
6.0		DOCKING AND UNDOCKING		\$	\$	\$	\$	
7.0		HULL (SURVEY ITEM)						
	7.3	Bead/m welding services						\$
	7.4	40 m preparation and repair by welding services		\$	\$	\$	\$	
	7.5	250 m ² below the water line hull coating services		\$	\$	\$	\$	
	7.6	100 m ² above the water line hull coating services		\$	\$	\$	\$	
	7.5	250/m ² below the water line hull coating		\$	\$	\$	\$	
	7.6	100/m ² above the water line hull coating		\$	\$	\$	\$	
8.0		SEA INLETS (SURVEY ITEM)		\$	\$	\$	\$	
	8.3	Removal and disposal of 0.25 m ³ solid debris		\$	\$	\$	\$	
	8.3	1 nut, 1 washer and 1 lock washer priced as one unit.						\$
9.0		TANKS / SPACES (SURVEY ITEM)		\$	\$	\$	\$	
	9.4	Disposal of 50 liters of sludge and debris from ballast tanks		\$	\$	\$	\$	

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030md

CCC No./N° CCC - FMS No/ N° VME

	9.5	Disposal of 100 liters of fuel		\$	\$	\$	\$	
	9.6	Disposal of 20 liters of lube oil		\$	\$	\$	\$	
	9.7	Disposal of 20 liters of sludge and debris		\$	\$	\$	\$	
10.0		SHIP SIDE VALVES (SURVEY ITEM)		\$	\$	\$	\$	
11.0		ANCHOR & ANCHOR CHAIN / CHAIN LOCKER INSPECTION		\$	\$	\$	\$	
	11.2	Removal and disposal of 0.25 m ³ sludge and debris		\$	\$	\$	\$	
12.0		ANCHOR WINDLASS OVERHAUL (SURVEY ITEM)		\$	\$	\$	\$	
		<u>TOTAL</u>		\$	\$	\$	\$	

END

J. SWANN (1963) LTD.

VANCOUVER, B.C.

CANADA

ELECTRIC ANCHOR WINDLASS

SERIES NO. 'WE'-318

J. SWANN (1963) LTD.

SPECIFICATION

ELECTRIC ANCHOR WINDLASS

SERIES No. 'WE'-318

Chain Size:	7/8" to 1 1/16" Stud Link.
Line Pull:	10,000 lbs.
Line Speed:	30 fpm.
Frame:	Fabricated steel, hot-dipped galvanized.
Wildcats:	Cast steel, running independent of each other and of the warping heads. Wildcats may be declutched from the drive train to allow free running out.
Warping Heads:	Cast iron, can be operated independently of the wildcats.
Bearings:	Best quality bronze bushings.
Gearing:	Cast steel, with machine cut teeth and running in a totally enclosed gearbox.
Drive:	A 10hp. 440/3/60, T.E.N.V. electric motor rated for 30 min. service and driving through a torque limiting coupling to prevent overloading.
Brakes:	Self-energizing band type on each wildcat, fitted with woven asbestos lining and operated by handwheels.
Weight:	Approximately 3000 lbs.

TITLE:			SERIES No. W.318E			
DOUBLE WILDCAT ELECTRIC WINDLASS			SHEET 1 OF 3			
ITEM	NAME	MATERIAL	No	SH	DWG No	C.P.
1	CASE	47½ × 26 × ½ M.S. PLATE	1	3	D.220	
		28¾ × 26 × ½ M.S. PLATE	1			
		28¾ × 11 × ½ M.S. PLATE	1			
		26 × 10½ × ½ M.S. PLATE	2			
		20 × 18½ × ½ M.S. PLATE	1			
		3½ × 3 × ½ M.S. PLATE	2			
		3 × 2¼ × ½ M.S. PLATE	2			
		37½ × 6½ × ¼ M.S. PLATE	1			
		79½ × 1" HALF ROUND	1			
2	BASE	54½ × 49½ × 5/8 M.S. PLATE	1	4	D.221	
		4¾ × 3½ × 5/8 M.S. PLATE	2			
		228 × 2½ × 2½ × ½ ANGLE	1			
		6 × 6 Ø STD. PIPE	2			
3	MAIN SHAFT	3½ Ø × 45 7/8 SUPERIOR	1	5	B.334	
4	WILDCAT	C.S. PATT. NO. 318-1	2	5	A.1069	
5	WARPINGHEAD	C.I. PATT. NO. 318-2	2	5	A.1068	
6	MAIN SHAFT GEAR					
	90T. 4 D.P.	C.S. PATT. NO. 225-1	1	5	A.1074	
7	HANDWHEEL, CLUTCH	C.S. PATT. NO. 69-3 (MOD)	2	5	A.1062	
8	BEARING	C.I. 'M' COUP.	2	5	A.1070	
		4 O.D. × ¼ WALL × 3¾ C.D.	2			
9	KEY, CLUTCH	10¾ × 1½ KEY STEEL	4	5	A.1067	
10	WASHER	4 Ø × 3/8 M.S.	2	5	A.1066	
11	SHAFT, CLUTCH	1¼ Ø × 6¾ M.S.	2	5	A.1065	
12	GEAR, CLUSTER		1	5	A.1059	
	75T 5 D.P.	PATT. NO. 1043-3 C.S.	1			
		S.A.E. 1040				
	20T. 4 D.P.	5½ Ø × 7 S.A.E. 1040	1			
		2½ O.D. × ¼ WALL × 6 LG. C.B.	1			
13	COUPLING	C.I. 'G' COUP	2	5	A.1058	
14	SHAFT, INTER.	2 Ø × 16¼ SUPERIOR	1	5	A.1057	
15	COLLAR	3½ Ø × 1 M.S.	1	5	A.277	
16	SPACER	3 O.D. × 1 WALL × 1 C.B.	1	5	A.1060	
17	GEAR	PATT. NO. 266-1	1	5	A.1588	
	61 T. 5 D.P.	C.S. S.A.E. 1040				
J. SWANN (1963) LTD.						TOTAL

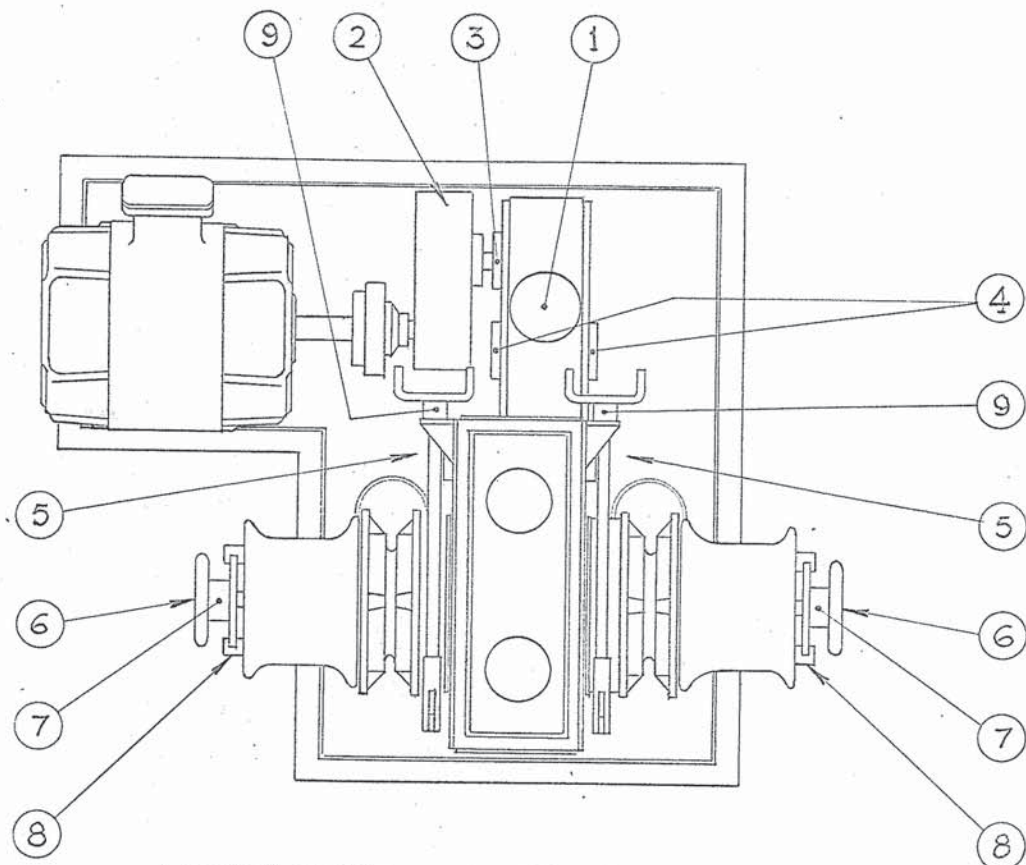
TITLE:			SERIES No. W. 318E			
DOUBLE WILDCAT ELECTRIC WINDLASS			SHEET 2 OF 3			
ITEM	NAME	MATERIAL	No	SH	DWG No	C.P.
18.	COUPLING	C.I. 'G' COUP.	2	5	A.1051	
		2 1/8 O.D. x 3/16 WALL x 2 1/4 C.B.				
19.	SHAFT, COUNTER	1 3/4 ϕ x 9 1/4 SUPERIOR	1		A.1585	
20.	PINION					
	20 T. 5 D.P.	4 1/2 O.D. x 2 1/2 S.A.E. 1040	1		A.1048	
21.	PLATE, TOP	26 x 8 1/2 x 3/8 M.S. PLATE	1	6	B.223	
		5 1/2 ϕ x 5/8 M.S. PLATE	2			
		7 x 4 ϕ STD. PIPE	2			
22.	OILER	8 1/2 x 2 x 1/4 M.S. PLATE	1	6	A1098	
		22 x 5/16 ROUND STK	1			
23.	COVER	5 1/2 ϕ x 1/4 M.S. PLATE	1	6	A.1749	
24.	BRACKET	8 x 6 1/4 x 1/4 M.S. PLATE	1	6	A.1755	
25.	BRAKE BAND	1/4 x 2 1/2 x 47 M.S.	2	6	B.227	
		1/4 x 2 1/2 x 45 1/2 LINING	2			
		3/4 x 3 x 5 M.S.	2			
		3/8 x 2 x 2 1/2 M.S.	4			
26.	COVER	11 1/8 x 8 1/4 x 11 GA. M.S.	2	6	A1735	
		34 3/4 x 5 1/4 x 11 GA. M.S.	1			
27.	COVER, ACCESS	6 ϕ x 1/4 M.S. PLATE	1	6	A.1045	
28.	PINION					
	20 T. 5 D.P.	4 1/2 O.D. x 2 1/4 S.A.E. 1040	1	6	A1732	
29.	SHAFT, INPUT	1 1/2 ϕ x 14 SUPERIOR	1	6	A1733	
30.	BEARING	C.I. 'G' COUP.	1	6	A1754	
		1 7/8 O.D. x 1 1/2 x 3/16 WALL C.B.	1			
31.	HANDLE, BRAKE	2 x 2 ϕ M.S.	2	7	A1735	
		13 1/2 x 5/8 ϕ M.S.	2			
32.	BRAKE ROD	1 ϕ x 27 M.S.	2	7	A.1093	
		4 x 1 1/2 x 3/8 M.S. PLATE	2			
33.	COLLAR	1 3/4 ϕ x 1/2 M.S.	2	7	A1018	
34.	LEVER	8 1/4 x 4 x 3/4 M.S. PLATE	2	7	A1095	
35.	LINK	6 1/2 x 1 1/2 x 3/8 M.S. PLATE	4	7	A1096	
36.	LINK	9 1/2 x 1 1/2 x 3/8 M.S. PLATE	4	7	A1097	
37.	PIN	2 3/8 x 3/4 ϕ S. STEEL	12	7	A602	
38.	ANCHOR	5 x 4 x 3/4 M.S. PLATE	2	7	A1041	
39.	CHAIN STRIPPER	10 x 3 1/2 x 5/8 M.S. PLATE	2	7	A1046	
J. SWANN (1963) LTD.			TOTAL			

[illegible]

J. SWANN (1963) LTD.

ELECTRIC ANCHOR WINDLASS

SERIES NO 'WE'-318



LUBRICATION INSTRUCTIONS.

NO.	PART LUBRICATED.	METHOD	LUBRICANT	APPLICATION
1	GEAR CASE		MED. GEAR OIL	SEE NOTE
2	GEAR REDUCER		MED. GEAR OIL	SEE NOTE
3	BEARING, INPUT SHAFT	PRESSURE	GREASE	DAILY WHEN OPERATING
4	BEARING, COUNTER SHAFT	PRESSURE	GREASE	DAILY WHEN OPERATING
5	BEARING, INTER. SHAFT	PRESSURE	GREASE	DAILY WHEN OPERATING
6	WILDCAT	PRESSURE	GREASE	DAILY WHEN OPERATING
7	HANDWHEEL, CLUTCH	PRESSURE	GREASE	DAILY WHEN OPERATING
8	KEY, CLUTCH	BRUSH	GREASE	DAILY WHEN OPERATING
9	HANDLE, BRAKE	PRESSURE	GREASE	DAILY WHEN OPERATING

NOTE

OIL LEVEL IN GEAR CASES SHOULD BE CHECKED PERIODICALLY BY REMOVING LEVEL PLUGS AT SIDE OF CASES.

DRAIN AND REFILL TO LEVEL PLUG EVERY SIX MONTHS.

J. Swann (1963) Ltd.

Double Wildcat Electric Windlass

Series No. 'W'-318E

Installation Instructions

1. Ensure that the windlass is securely bolted down.
2. Connect the 10 HP electric motor, to a 220/440 volt,
3 phase power supply.

J. Swann (1963) Ltd.

Double Wildcat Electric Windlass

Series No. 'W'-318E

Operating Instructions

1. The windlass is energized by starting the electric motor mounted on the windlass base.
2. The wildcats are connected to the main drive train by screwing in the clutch handwheels located at the outer end of each warping head. When these clutches are disengaged and the mechanical holding brakes are released the wildcats will free-wheel.
3. Each wildcat is fitted with a mechanical holding brake operated by means of handwheels located at the rear of the windlass. To apply the brakes the handwheels are rotated in a clockwise direction.



squirrel cage and wound rotor *Life-Line* motors

installation, operation, and maintenance instructions

instruction
leaflet

H-3100

frames 182 to 509US • ball or sleeve bearings • horizontal
single and 3 phase • drip-proof and totally enclosed

page 1

general

Life-Line induction motors are designed for a wide variety of constant-speed applications. Sturdy cast iron construction is employed throughout, with the stator core completely encased in a solid frame.

Drip-proof motors are efficiently ventilated, the cooling air being drawn in end brackets and expelled through openings in the end bracket on smaller ratings and frame on larger ratings. Ventilation openings are of liberal size to provide ample cooling, yet their location and shape are such to afford a high degree of protection to the interior of the motor.

In totally enclosed fan-cooled motors, the ventilating air is blown over the externally ribbed surface, thereby keeping the frame clean and promoting effective cooling. For extremely dirty installations, this external surface is directly accessible for cleaning. A rugged, two-piece, cast iron hood shrouds the fan and directs the cooling air axially over the frame. The most active standard motors have a chemically inert, molded glass fan. Other standard motors have bronze fans for extra corrosion resistance in chemical atmospheres. Uni-directional fans are used on motors (364U - 445U frames) having speeds exceeding 2,000 rpm (1400 rpm for 500U frames); direction of rotation must agree with rotational nameplate. If required to operate in reverse direction from that shown on nameplate, remove and reverse the fan.

Totally enclosed non-ventilated motors use either the fan-cooled construction without fan and hood, or the drip-proof construction with solid covers over bracket and frame ventilation openings.

In all totally enclosed motors, none of the internal parts is exposed to the external air.

receiving

Unpack the motor and make certain that it was not damaged during shipment. Turn the shaft by hand to see that it turns freely.

Check to see that the nameplate data agrees with the voltage and frequency of the power supply provided for the motor.

Shaft extension is coated with a slushing compound to prevent rusting during shipment and storage. This slushing compound may be removed by wiping with turpentine or any petroleum solvent such as benzine, gasoline, Stoddard solvent, etc.

See precautions under "maintenance" for use of these solvents.

installation

mounting: Locate the motor in a place that is well-ventilated. If protecting shields or guards are used,

they must not obstruct the free flow of air around the motor. The external air temperature should not exceed 40°C or 104°F, unless the motor has been specially designed or otherwise cleared for use in higher ambient.

Fasten to a rigid foundation using bolts or screws of the largest size permitted by the drilling in the mounting feet. The motor must rest evenly on all four foot-pads.

For wall or ceiling horizontal mounting, the end brackets of sleeve bearing motors must be rotated 90° or 180° to prevent loss of oil supply. For all drip-proof motors, end brackets should be similarly rotated to maintain their drip-proof protection. All brackets have sturdy projecting lugs to permit ready disassembly.

Grease lubricated ball bearing motors may be mounted at any desired odd angle, providing decreased drip-proof protection is not detrimental.

method of drive: Any of the following drive methods may be used depending on the particular motor application.

1. **belt drive.** Mount the motor on slide rails or base, which allows for adjusting the belt tension.

Mount the motor sheave or pulley as close to the bearing housing as possible, allowing sufficient clearance for rotor end play. The centre line of the sheave must not extend beyond the end of the shaft.

The smallest sheave or pulley should not be less in diameter than that recommended by the belt manufacturer for the belt used.

Sheaves or pulleys should be carefully aligned. Belt tension should be just sufficient to carry normal load without slippage; for first trial, tension should be only enough to eliminate excessive sag in the slack side of the belt. V-belts do not require as much tension as flat belts.

2. **chain drive.** Mount the motor on slide rails or base to permit adjustment in centre distance between shafts.

Mount the motor sprocket close to the bearing housing, allowing sufficient clearance for rotor end play, and align the sprockets accurately.

3. **gear drive.** Mount the motor and driven unit so as to maintain accurate alignment. The gears must mesh accurately to prevent vibration.

Mount the motor pinion close to the bearing housing to minimize the overhang, allowing sufficient clearance for rotor end play.

Dowel the motor to the base.



4. *direct drive.* The motor shaft and driven shaft must be carefully aligned.

Dowel the motor to the base.

note: Pulleys, pinions or coupling halves should have a close sliding fit on the shaft extension and must be securely locked to avoid hammering out in operation. If it is necessary to drive the part into position, it is important, on ball bearing motors, that the end of the shaft opposite the extension be backed up so that the force of the blow is not taken in the bearing. Use a pinion puller for removing tight pulleys.

electrical connections: Be sure the motor is connected as shown on the nameplate diagram, and that the power supply (Voltage, Frequency and Number of Phases) corresponds with the nameplate data.

Connect to the power supply through a suitable switch and overload protection.

Install all wiring and fusing in accordance with the C.S.A. Code and local requirements.

To change the direction of rotation on three-phase motors, interchange any two-line leads.

To change the direction of rotation on two-phase motors, interchange the line leads of either phase.

conduit box: If the conduit box is desired on the opposite side of the motor, remove the brackets and rotor, reverse the frame, and reassemble.

The conduit box is mounted near the horizontal centerline, and may be rotated in steps of 90° to receive conduit from any of four directions.

Drip-proof motors use a sheet steel box with knock-out for conduit entrance. When conduit entry is from above, a special method of connecting conduit is recommended. This incorporates rubber washer, conduit locknut and sealing of threaded entrance with red lead.

Enclosed motors have a cast iron box tapped for receiving rigid conduit. Pipe-size conforms to accepted standards for the particular motor frame size, and a reducer should be used when connecting to smaller conduit.

When the motor is mounted on a bedplate or on slide rails for belt adjustment, flexible metallic conduit should be used to protect the incoming cable. In making this connection a squeeze connector should be used for attaching the flexible conduit to the motor box. Squeeze connectors may be straight, 45° or 90°.

operation

Run the motor without load to check the connections and direction of rotation.

The motor will operate satisfactorily with a 10 percent variation in voltage, a 5 percent variation in frequency, or a combined voltage and frequency variation of 10 percent, but not necessarily in accordance with the standards of performance established for operation at normal rating.

single phase: The following information applies specifically to type HCA motors.

capacitors: The design L motor is furnished with starting capacitors only, located in the conduit box. These capacitors are in insulated containers held in place in the conduit box by a clamp. Continuous, frequent starting or high ambient temperature may damage the starting capacitors. These capacitors are intermittently rated and permit 20 motor starts per hour when each start has a three second accelerating time.

centrifugal switch: On those motors where the switching mechanism is a centrifugal switch, it functions to disconnect the starting capacitors when the motor has reached a predetermined speed. On the design L the starting winding is also disconnected. On the design M motor the running capacitor and winding remain in the circuit and function during the normal operation of the motor.

The centrifugal switch consists of two parts: contacts and governor mechanism. The contacts are stationary and are located in the front bracket. The governor mechanism is pressed on the shaft and rotates with it. When a predetermined speed is reached, the governor opens the contacts and disconnects the starting capacitors as previously described.

wound rotor: In addition to the data on squirrel cage motors the following points must be observed for these motors.

brushes: The brush-holder assembly is designed such that each brush is held against the ring with a force of $\frac{3}{4}$ to $1\frac{1}{4}$ pounds (213X to 326X) or 3 to 5 pounds (364X to 509X). The assembly should be checked in service to assure this pressure is maintained. On most fan cooled units the brush holder servicing is accomplished through removing the shroud over the front bracket and hand hole threaded covers.

The brushes should make good contact with the slip rings along the whole face of the brush. If necessary, grind the brushes in with fine sandpaper. Do not use lubricants. Use the correct grade of brushes which may be obtained from the nearest Westinghouse dealer.

slip rings: Should be maintained smooth and true. Grind or turn them if necessary, to restore a smooth and true surface. For additional information, methods of locating and correcting troubles, and making repairs, apply to the nearest Westinghouse District Office.

secondary connections: A squeeze connector is supplied on the front bracket to accommodate the secondary leads; no leads are furnished. Customer should extend leads from the conduit through the squeeze connector to the terminals on the brush holders. Non vent motors furnished with secondary conduit box mounted on front bracket.

On smaller motors, the squeeze connector is omitted and secondary leads are supplied extending from brush holder into primary conduit box, as well as for all fan cooled or explosion-resisting designs.



squirrel cage and wound rotor *Life-Line* motors

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frames 182 to 509US • types HCA, HSA, HWA, HIA

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maintenance

inspection: Although Life-Line motors require a minimum of attention in service, they should be inspected at regular intervals to check for excessive (1) dirt, (2) moisture, (3) friction and (4) vibration, which account for 90 percent of all motor failures.

1. *guard against dirt.* Keep the installation and mechanical parts of the motor clean. Dust that is free from oil or grease may be removed by wiping with a clean, dry cloth, or preferably, by suction. Dust may be blown from inaccessible parts with clean, dry air, using not more than 30 to 50 pounds pressure. Use care to prevent personal injury from flying particles.

When grease or oil is present, wipe with a cloth moistened (but not dripping) with a petroleum solvent of a "safety type" such as Stoddard solvent or similar materials available under various trade names. Wear suitable gloves to prevent skin irritation when using these petroleum solvents.

Petroleum solvents are flammable but relatively non-toxic.

2. *guard against moisture.* Care should be taken to protect drip-proof motors from accidental hosing.

The insulation resistance of stand-by motors should be checked with a "megger" at regular intervals to detect the presence of moisture in the windings. If the insulation resistance shows an appreciable decrease, the windings should be dried out by any suitable means before applying power to the motor.

This is particularly important in installations where the ambient temperature is subject to frequent, sharp fluctuations, or where the atmosphere is unusually damp. For less severe locations, running stand-by motors at least once a week should protect the windings from moisture absorption or condensation. Drain plugs in totally enclosed motors must be removed periodically in humid atmospheres to prevent condensed water from coming in contact with the stator winding.

Before motor windings are blown out with air, make sure that water has not condensed in the air line.

3. *guard against friction.* Excessive friction or overheating of bearings is usually traced to one of the following causes:

- (a) Overgreasing.
- (b) Insufficient lubricant.
- (c) Excessive belt tension.
- (d) Poor alignment, such as to cause vibration or binding.
- (e) Lack of end play.
- (f) Excessive end or side thrust from gearing couplings, etc.

If the overheating is not localized in the bearings, but prevails in the motor generally, check the following possible sources of trouble:

- (a) Overload.
- (b) Impaired ventilation, caused by heavy accumulation of dirt in ventilation passages or on dissipating surfaces, or by other obstructions to the normal cooling.

4. *guard against vibration.* To avoid failures due to vibration, a few simple checks should be made regularly:

Check for misalignment such as may be caused by foundation settling or heavy floor loading. These may be causing vibration through misalignment.

Check to see if vibration from the driven machine is being transmitted to the motor.

Check for excessive belt or chain tension or the push-apart effect inherent in spur gears.

Check the motor mounting bolts, bracket bolts, and the pulley or coupling to make sure they are securely fastened.

coils: Revarnishing the windings when motors are overhauled will lengthen their life. Suitable varnish may be obtained from the nearest Westinghouse sales office.

bearings: When shipped from the factory, grease lubricated ball bearing motors have a sufficient quantity of the proper grade grease to last for a long period. This period will vary depending on the application. Motors complete with grease fittings may be regreased. When regreasing, stop motor, remove drain plug, add Westinghouse grease (with hand operated gun only) until grease appears at drain hole. Run motor for approximately ten minutes before replacing drain plug. It is recommended for easy applications no lubricant be added, for average applications motor be lubricated every three to six years, and for severe applications, greasing be done on the basis of experience. For further information see chapter 6 of Westinghouse publication H.B.-6001-MN entitled "Maintenance Hints."

explosion-proof motors: Type HSA squirrel cage motors are approved for hazardous locations by CSA Approvals Laboratories. This covers class I group D and class II groups E, F & G. End shield and closure bolts must be tight. Safety of use will be endangered should openings or other alterations be made.

It is recommended that when repairs are required they be done by the Canadian Westinghouse Company or authorized agents. Upon disassembly in the field the original approval is no longer valid and repaired motors must have approval of the local electrical inspection authority.



squirrel cage and wound rotor Life-Line A motors
installation, operation, and maintenance instructions

renewal parts

Renewal parts information may be obtained from the nearest Westinghouse sales office. Be sure to name the part or parts required and give the complete nameplate reading on the motor for positive identification.

warranty: The company in connection with apparatus sold agrees to correct any defect or defects in workmanship or material which may develop under proper or normal use during the period of one year from the date of shipment, by repair or by replacement f.o.b. factory of the defective part or parts, and such correction shall constitute a fulfilment of all the company's liabilities in respect to said apparatus, unless otherwise stated in the quotation.

Any defects that may develop should be referred to the nearest Westinghouse sales office for complete servicing information.

branch sales offices

Calgary.....	330-11th Avenue West.....	686-8821
Chicoutimi.....	1133 Talbot Blvd.....	549-0368
Edmonton.....	10312-105th Street.....	424-7131
Fort William.....	700 Norah Crescent.....	622-0638
Halifax.....	3377 Kempt Road.....	454-5851
Hamilton.....	216 Superior Street.....	528-8811
London.....	317 Adelaide St. South.....	433-5391-2
Moncton.....	146 Albert Street.....	389-2401
Montreal.....	2125 23rd Ave., Lachine.....	631-9471
North Bay.....	621 Main Street West.....	472-4300
Ottawa.....	1800 Bank Street.....	733-2500
Quebec.....	2100 Charest Blvd. West.....	681-3501
Regina.....	1625-8th Avenue.....	569-8614
Saskatoon.....	740-1st Avenue North.....	242-1296
Sept-Îles.....	480 Avenue Laure.....	642-3366
Toronto.....	840 York Mills Rd.....	455-0550
Trail.....	860 Eldorado St.....	368-3031
Vancouver.....	1000 Beach Avenue.....	682-5533
Victoria.....	831 Yates Street.....	382-7265
Windsor.....	1167 Mercer Street.....	254-9211-2
Winnipeg.....	1460 Ellice Avenue.....	772-9401

apparatus service centres

Calgary.....	330-11th Avenue West.....	266-8821
Edmonton.....	10312-105th Street.....	424-7131
Halifax.....	2651 Clifton Street.....	454-5851
Hamilton.....	717 Woodward Avenue.....	528-8811
Moncton.....	80 Enterprise Street.....	382-4457
Montreal.....	180 Authier Street.....	748-8811
Nanaimo.....	666 Pine Street.....	753-1332
Sept-Îles.....	480 Avenue Laure.....	942-4559
Swastika.....	Westinghouse Ave.....	642-3366
Toronto.....	1475 The Queensway, Etobicoke (suburban exchanges call 763-5169)	255-8551
Vancouver.....	281 Industrial Ave.....	683-5721
Winnipeg.....	1460 Ellice Avenue.....	772-9401

A technical drawing of a sprocket and chain assembly. The sprocket is a cylindrical gear with a hexagonal nut on top. A chain is wrapped around the sprocket, showing the links and pins. The drawing is a perspective view, showing the sprocket from the side and the chain extending from it.

Coupling No.	Weight Lbs.	Max. Ft. Lbs. Torque	No. of Springs	MAXIMUM BORE		MINIMUM BORE		Coupling Half No.	OSD Sprocket No.	Coupling Chain No.	FINISH BORE—K.W. & S.S.		Price	DIMENSIONS				
				Coupling Half	OSD Half	Coupling Half	OSD Half				A	B		C	D	E		
OSDC-225	4	35	1	1 1/2"	3/4"	1/2"	4020A	40A20XC	D40	3/8", 7/16", 1/2", 9/16", 5/8", 3/4"	Coupling Half 1/2", 3/8", 7/16", 1/2", 1", 1 1/8", 1 1/4"	\$43.00	3.656"	1 1/8"	2"	2 3/32"	2 1/16"	
OSDC-225X	4	50	2	1 1/2"	3/4"	1/2"	4020A	40A20XC	D40	3/8", 7/16", 1/2", 9/16", 5/8", 3/4"	Coupling Half 1/2", 3/8", 7/16", 1/2", 1", 1 1/8", 1 1/4"	47.00	3.656"	1 1/8"	2"	2 3/32"	2 1/16"	
OSDC-337	9 1/2	100	1	2 1/4"	1"	1/2"	4027A	40A27XC	D40	1/2", 9/16", 5/8", 3/4", 7/8", 1"	Coupling Half 3/8", 1", 1 1/8", 1 1/4", 1 1/2", 1 3/8"	61.60	4.00	4.767"	1 1/8"	2 1/8"	3 1/32"	3 3/4"
OSDC-337X	9 1/2	175	2	2 1/8"	1"	1/2"	4027A	40A27XC	D40	1/2", 9/16", 5/8", 3/4", 7/8", 1"	Coupling Half 3/8", 1", 1 1/8", 1 1/4", 1 1/2", 1 3/8"	66.60	4.00	4.767"	1 1/8"	2 1/8"	3 1/32"	3 3/4"
OSDC-450 ✓	16	190	1	3"	3/4"	3/4"	5026A	50A26XC	D50	3/4", 1", 1 1/8", 1 1/4", 1 3/8"	Coupling Half 1 1/8", 1 1/2", 1 3/8", 1 3/4", 1 7/8", 1 15/16", 2", 2 1/8"	82.40	5.00	5.775"	1 1/2"	2 3/8"	4 3/16"	4 1/2"
OSDC-450X	16	285	2	3"	3/4"	3/4"	5026A	50A26XC	D50	3/4", 1", 1 1/8", 1 1/4", 1 3/8"	Coupling Half 1 1/8", 1 1/2", 1 3/8", 1 3/4", 1 7/8", 1 15/16", 2", 2 1/8"	89.40	5.00	5.775"	1 1/2"	2 3/8"	4 3/16"	4 1/2"
OSDC-600	30	320	1	4"	1 3/8"	1"	6031A	60A31XC	D60	1", 1 1/8", 1 1/4", 1 3/8", 1 7/8", 1 1/2", 1 3/4"	Coupling Half 1 3/8", 1 1/2", 1 3/4", 1 7/8", 1 15/16", 2", 2 1/8"	149.50	5.50	8.093"	2"	3"	4 7/8"	6 1/2"
OSDC-600X	30	440	2	4"	1 3/8"	1"	6031A	60A31XC	D60	1", 1 1/8", 1 1/4", 1 3/8", 1 7/8", 1 1/2", 1 3/4"	Coupling Half 1 3/8", 1 1/2", 1 3/4", 1 7/8", 1 15/16", 2", 2 1/8"	157.00	5.50	8.093"	2"	3"	4 7/8"	6 1/2"
OSDC-750	46	550	1	5"	2 1/2"	1"	8027A	80A27XC	D80	1", 1 1/4", 1 1/2", 1 3/4", 1 15/16", 2", 2 1/8"	Coupling Half 1 1/4", 2 3/16", 2 1/8", 2 1/16", 2 1/8", 3 1/8", 3 15/16", 4 3/16"	220.00	6.50	9.489"	2 3/8"	3 3/4"	5 5/32"	7 9/16"
OSDC-750X	46	775	2	5"	2 1/2"	1"	8027A	80A27XC	D80	1", 1 1/4", 1 1/2", 1 3/4", 1 15/16", 2", 2 1/8"	Coupling Half 1 1/4", 2 3/16", 2 1/8", 2 1/16", 2 1/8", 3 1/8", 3 15/16", 4 3/16"	228.00	6.50	9.489"	2 3/8"	3 3/4"	5 5/32"	7 9/16"

*For maximum bore on OSD225, OSD225X, OSD337 and OSD337X, a shallow keyway is used of 1/2 standard depth. Use the next larger size "OSD" unit when a standard keyway is desired.

*IMPORTANT. Be sure to specify when sprocket or driving member width is in excess of D₂ dimension. Special fabricate suit will be furnished.

IMPORTANT NOTE: The chart shown above is for stock sizes. The "OSDC" overload safety device can be made to suit your application. Send us your blueprints or specifications for recommendations by our engineering

"OSDC" PARTS LIST					
	OSDC-225	OSDC-337	OSDC-450	OSDC-600	OSDC-750
OSDC COUPLING HALF	\$12.16	\$17.80	\$23.66	\$50.82	\$71.04
OSDC COUPLING CHAIN	4.44	6.00	8.74	19.68	34.96
OSD SPROCKET	8.40	9.80	12.00	19.00	24.00

FOR PARTS OF OSD HALF, SEE PAGE 3