



**PRODUCT STANDARD**  
SWITCHGEAR ENGINEERING DIVISION

SG 12705 REV.05

PAGE 01 OF 03

**GEAR BOX ASSEMBLY FOR VACUUM CIRCUIT BREAKERS**

**1. INTRODUCTION :**

Gear box assembly to drawings no. 05211001502 & 05211001505 is used in spring operating mechanism of vacuum Breaker products. Main functions of this assembly are:

- To charge closing spring (by hand or electrical motor).
- To regulate the discharge of the closing spring energy into the linkage system.

Quality and performance of the gear box assembly is of critical importance for VCB.

**2. MATERIALS :**

The materials and finish of gear box assembly items shall be as specified on individual item drawings covered in BOM drawing no. 35211001592 Var.00 & 01.

3. Supplier shall follow a quality plan approved by BHEL.

**4. TEST REQUIREMENT :**

Each gear box assembly shall be tested at supplier's works for minimum 50 nos. close-open operations. For this purpose the gear box shall be mounted in the operating fixture fitted with closing spring to drawing no. 25211001534 Var.00 and spring charging motor to drawing no. 25211001582. Following observations shall be made during this test :

- i) The gear box operation must be free from any abnormal sound.
- ii) During operation of gear box no excessive friction / jamming should occur. This shall also be verified by manual charging of closing spring using spring charging handle to drawing no. 35211001509-Var.00.
- iii) Following parameters shall be recorded for the last five operation of the 50 operations test.

- Spring charging time (To be within 10 sec).
- Load current drawn by spring charging motor {To be within 5 A (Excluding initial peak) at 220 VDC or 230 VAC}

Note:

1. Test at sl. no. (iii) is not applicable for exclusive hand charging gearbox.
2. Above closing spring & spring charging motor may be supplied by BHEL on chargeable basis.

**COPYRIGHT AND CONFIDENTIAL**

The information on this document is the property of Bharat Heavy Electricals Limited  
It must not be used directly or indirectly in any way detrimental to interest of Co.

<b>REV.</b>	05	<b>PRINTS TO :-</b>		<b>APPROVED -</b>		
<b>ALTD.</b>	RM	SWM (PLNG)	1	R K SHUKLA		
<b>APPD.</b>	DKD	QCX (SCR)	1	<b>PREP</b>	<b>ISSUED</b>	<b>DATE</b>
<b>DATE.</b>	15-07-2005	PD & D)	1	S.M.M	B.P.N	30.03.95



**PRODUCT STANDARD**  
SWITCHGEAR ENGINEERING DIVISION

SG 12705 REV.05

PAGE 02 OF 03

5. **ACCEPTANCE CRITERION :**

i) **VISUAL CHECKS** : Gear box assemblies shall be inspected for general finish and completeness of the assembly.

ii) **TEST CERTIFICATES** : Supplier shall submit following test certificate with each lot of supply.

- Certificate for the tests conducted and observations made as per the requirements of para 3. A format of test certificate is given in annexure-I.
- Certificate for meeting the requirements of materials used, dimensions, process followed and finish as specified on individual items and assembly drawings of Gear box assembly.

| Assy drawing no. 05211001502 and 05211001505 |  
| | |  
| Bill of Materials (BOM) drg. no. 35211001592 Var.00 & Var.01 |  
| Var.00: Motor charging gear box; Var01: Hand charging gear box. |

iii) Certificate for compliance to approved quality plan.

6. **PACKING :**

Each assembly shall be packed in a suitable cardboard carton and the lot of 10 or 20 cartons shall be packed in a wooden crate for bulk supply.

7. **IDENTIFICATION MARKINGS FOR TRACEABILITY :**

Each Gear Box assembly shall have following markings at locations shown on drawings.

- Suppliers name or logo
- Sr.no. of Gear box.
- Date of manufacturing.
- Hand charging direction (near by hand charging pocket) i.e. clock wise to be marked (for exclusive hand charging gearbox only).
- "HAND CHARGING GEARBOX" shall be paint marked or adhesive level shall be pasted on gear box casting (for exclusive hand charging gearbox only) to distinguish from motor charging gearbox.

**COPYRIGHT AND CONFIDENTIAL**

The information on this document is the property of Bharat Heavy Electricals Limited  
It must not be used directly or indirectly in any way detrimental to interest of Co.



**PRODUCT STANDARD**  
SWITCHGEAR ENGINEERING DIVISION

SG 12705 REV.05

PAGE 03 OF 03

**ANNEXURE-I**

**TEST CERTIFICATE FORMAT**

**P.O. NO. & DATE:**  
**QUANTITY:**  
**GEAR BOX SL. NOS. (RANGE):**

SL.	DESCRIPTION	REMARKS
1.	SUPPLIER'S NAME	
2.	NO. OF CLOSING OPERATIONS (MIN. 50 NOS.) (FITTED WITH CLOSING SPRING TO DRG.NO.255211001534 AND MOTOR TO DRG.NO.25211001582) (NO.)	
3.	ANY ABNORMAL/JAMMING SOUND DURING OPERATION (YES/NO)	
4.	ANY EXCESSIVE FRICTION/ROUGHNESS DURING OPERATION (YES/NO): (TO BE VERIFIED BY MANUAL CHARGING OF CLOSING SPRING USING SPRING CHARGING HANDLE TO DRG. NO. 35211001509-VAR00)	
*5.	PARAMETERS RECORDED FOR THE LAST FIVE OPERATIONS OF THE 50 OPERATIONS TEST - SPRING CHARGING TIME (MAX.10 SEC.) (TIME IN SEC) - LOAD CURRENT DRAWN BY SPRING CHARGING MOTOR {TO BE WITHIN 5 A (EXCLUDING INITIAL PEAK) AT 220 VDC OR 230VAC} (FURNISH RANGE)	
6.	ANY CRACK/BROKEN/DAMAGES OBTAINED BY VISUAL CHECK (YES/NO)	
7.	CERTIFIED THAT ALL MATERIALS USED AS PER APPROVED QA PLAN (✓ / ✗)	
<b>* Not applicable for exclusive hand charging gearbox.</b>		

DATE:

SIGNATURE OF QC OFFICER  
NAME OF FIRM:

**COPYRIGHT AND CONFIDENTIAL**

The information on this document is the property of Bharat Heavy Electricals Limited  
It must not be used directly or indirectly in any way detrimental to interest of Co.