नाम
Name : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुक्रमांक
Roll No : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

प्राप्तांक
Marks Awarded :

पाठ्यक्रम
Course : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

दिनांक
Date : _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

अनुदेशक के आद्यक्षर
Instructor Initial :

STUDY OF D.W. COMPENSATOR

INTRODUCTION TO D.W.COMPENSATOR:

The functions of a compensators are :

1.To compensate variation in length of wire caused by temperature changes so that the lever operation is equally effective in working the mechanism at all temperatures and so that the friction is independent of temperature variations.

2.To introduce initial tension of 150lbs or 68kgs in the transmission wire and to maintain this tension at all temperature with the transmission at rest such that the loss of stroke in the transmission minimized.

3. To impart sufficient stroke to the mechanism under broken wire conditions so as to ensure broken wire protection at all time.

4.To lock the compensator , during lever operation and transfer the stroke to the function.
Compensators are installed below the lever frame on the ground floor the cabin on

5. inches high channels by means of ¾ * 2 inches hexagonal head bolts and nuts. Compensator consists of a pedastal over which levers are fixed by means of 1 ¼ inch pin.This pin works as a fulcrum for the levers.The levers are notched at one end so that they can be lifted up by differential pulley blocks in case the transmission is attached to. A cast iron weight of 205 lbs (95kg) is attached to each lever at its notched end, The other end of the lever bears a wheel over which the transmission wires page. The ratio of the arms of the lever is roughly 1:3 (weight side). The two pawl plates engage with a ratchet rod which is hinged on the pedastal. During lever operation tension in pull wire increases and in return wire decreases. This will cause one of the weights to fall and the other to rise resulting in all the lever stroke bein absorbed in working the compensators and no stroke will be imparted to the function .Hence the movement of the compensator lever during operation of the lever should be restricted .This is achieved by the ratchet rod and pawl plate . The pawl plate is connected to the levers by links .During lever operation both the levers move in opposite directions which will tilt the pawl plate, the pawl engages with the teeth on the ratchet rod and locks the compensator levers from further movements.

To ensure that the full wire breakage stroke is available even at highest temparature and it is not reduced due to mal-adjustment of the transmission wires, a ¼ inch(6mm) dia counter sunk dispression the end of the compensating way, the guide of the ratchet rod must not pass the wire breakage mark.

The following types of types compensators are in use:

1. A type compensator single 56inches stroke.
2. A type compensator coupled 56inches stroke.
3. B type compensator single 72inches stroke.
4. B type compensator coupled 72inches stroke.
5. C type compensator coupled 92inches stroke.

In matric design the following compensators are standardized and they have a common ratchet rod.

1. Single compensator 2080 mm stroke.
2. Coupled compensator 1952mm stroke without gain stroke wheel.
3. Coupled compensator 2600mm stroke with gain stroke wheel.

With a type compensator two types of rachet rods are used.One having compensating stroke 12 inches and the second 18 inches with “B” type compensator also two types of ratchet rod can be used one having compensating stroke of 18 inches and the second 33 inches .with “C” type compensator only one type of ratchet rod is used which has a compensating stroke of 33inches. Compensating stroke is the capacity to compensate for the variation in length of wire caused by the maximum change in temparature.

VARIATION IN LENGTH $V = L * \alpha * T$.

Where L is the length of transmission .

α is the co-efficent of linear expansion.

T is the temparature range.

Wire breakage stroke that is the stroke that required under broken wire conditions to ensure that sufficient stroke is imparted to the transmission to take the function mechanism to safe positions .This is the sum of the following strokes.

1. Stretch in intact wire.
2. Maximum movement of mechanism under most adverse circumstances.
3. Tripping of lever/ levers.
4. Allovances for oversize drum, if any.
5. Safety margin.

The following are the differences between single and coupled compensator.

A) The single compensator has a narrow pedestal and the coupled compensatory has a wider pedestal.A single compensatory is fixed to the compensatory channel with two bolts and nuts were as the coupled compensatory is fixed with 4 bolts nuts.

B) The wheels provided at the end of the levers in a single compensatory are provided towards the inside of the levers they face each other where as in a coupled compensator they are provide out side of the levers.

C) A single compensatory has three pairs of wheels . where as a coupled compensatory has four pairs of wheels. The additional pair is required for crossing the wire ropes between lever and compensatory to make them passover the coupling device whels.

D) In the additional pair of wheels one wheel is 1 inches smaller than the rest to avoid the two wheels rubbing against each other when they are crossed for coupling device.

E) The compensatory lever of a single compensatory have an outside bevd whereas coupled compensatory levers are straight.

F) The coupled C type compensatory has a gain stroke lever and a link and the compensator levers have an additional pin for operating link.

1. Indicate the following parts in the sketch attached:

A. PEDASTAL.
B. ROPE WHEEL.
C. LEVERS.
D. WEIGHT.
E. RATCHET ROD.
F. GAIN STROKE LEVER.
G. LINK.

2. What are the functions of a D.W. compensatory?

a.

b.

c.

d.

3. a. Measure the length of compensatory lever.

b. Measure the distance from the fulcrum of the lever to the centre of the pin of the wheel X=

c. Measure the distance from the fulcrum of the lever to the centre of the weight Y=

d. The tension in the wires. $T = \frac{W * Y}{2 * X} =$

Where W is the weight of the compensator(205lbs) 95 kg

e. Height of the pedestal (from the fulcrum of the compensatory to the base).

f. Note the Height, total stroke, Compensating stroke, Wire breakage stroke of the compensatory.

Type of compensator	Height	Total stroke of compensator	Compensating stroke	Wire breakage stroke
Single A type				
Single B type				
Coupled A type				
Coupled B type				
Coupled C type				

g. In metric design single coupled without G.S .lever coupled with gian stroke lever.

4. What is the difference between an 'A' type and 'B' type compensatory.

5. What is the difference between coupled compensatory with gain stroke lever and without gain stroke lever?

6. What is the diference between a single and a copled compensatory?
   a. width of pedestal.
   b. no. of wheel.
   c. construction of levers.

7. What is the difference between B type and C type coupled compensatory?

8. How are the compensatory levers locked during operation?

9. What is the purpose of the wire breakage mark?

10. Why the two wheels mounted on the fulcrum of the coupled comensators are not of the same size ?

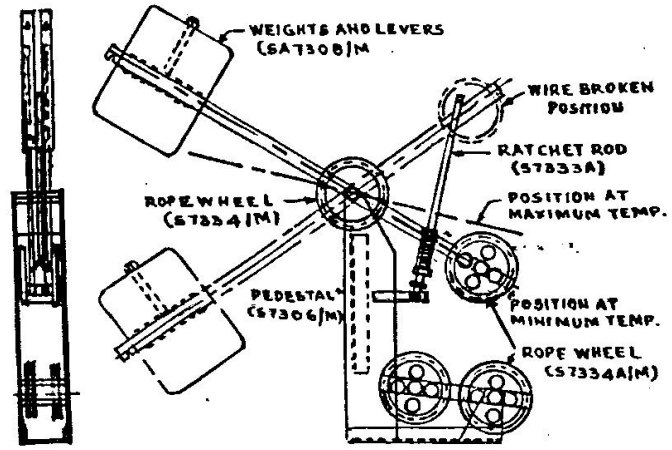
11. How are the compensators mounted in the cabin?

12. What is the number and size of bolts used for fixing the compensatory?

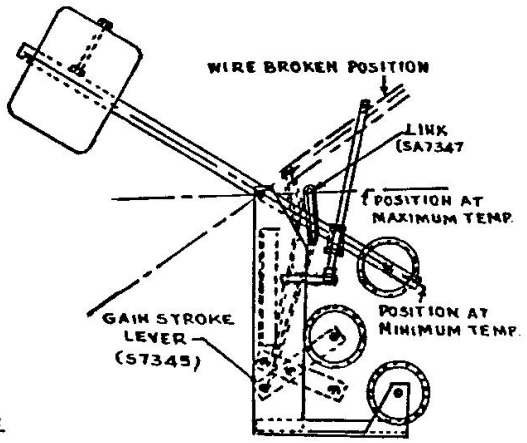
a. Single

b. Coupled

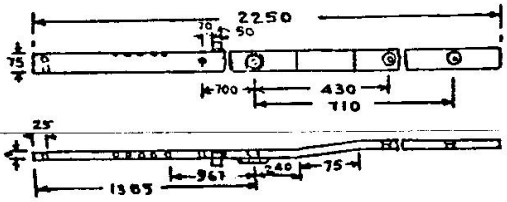
13. What is the distance between the front and rear of the compensatory channels?



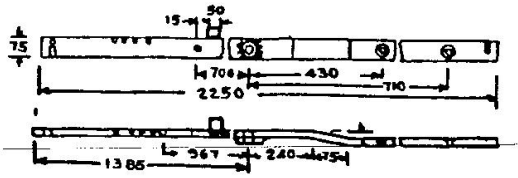
8.2/1 D.W.COMPENSATOR (COUPLED) 1950 mm STROKE
(SA7301/M)



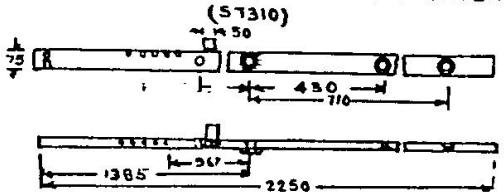
8.2/2 D.W.COMPENSTOR (COUPLED) 2600 mm
STROKE (SA7302/M)



8.2/3 SINGLE D.W.COMPENSATOR-LEVER(RH)
(S7309)



8.2/4 SINGLE D.W.COMPENSATOR-LEVER (L.H)
(S7310)



8.2/5 COUPLED D.W.COMPENSATOR-LEVER
(L.H &R.H.) (S7311)

Date; Signature of trainee