JOHNSON CONTROLS

JC 5383 Calibration Kit for T-5800 Series Receiver-Controllers and Most Johnson Controls Pneumatic Devices

The JC 5383 Calibration Kit is a portable, prepiped test panel designed for field calibration and checkout of T-5800 Receiver-Controllers. This versatile kit can also be used for calibration and checkout of the N-9000 Enthalpy Logic Center as well as various other controllers and auxiliary devices. The air connections, pressure regulators, and gages are numbered with lines drawn between them to show the internal circuitry of the panel. The panel is positioned in the case such that the case can be hung by the handle on the wall next to the control panel for hookup convenience.

The following is a simplified list of steps required to check out and calibrate T-5800 Series Receiver-Controllers and the N-9000 Enthalpy Logic Center. For more detailed calibration procedures, refer to the individual product literature available for these devices. For additional information on how to check out and calibrate various other Johnson Controls pneumatic devices, refer to the Pneumatic Operator's Manual (Publication 2054) and/or the product literature.

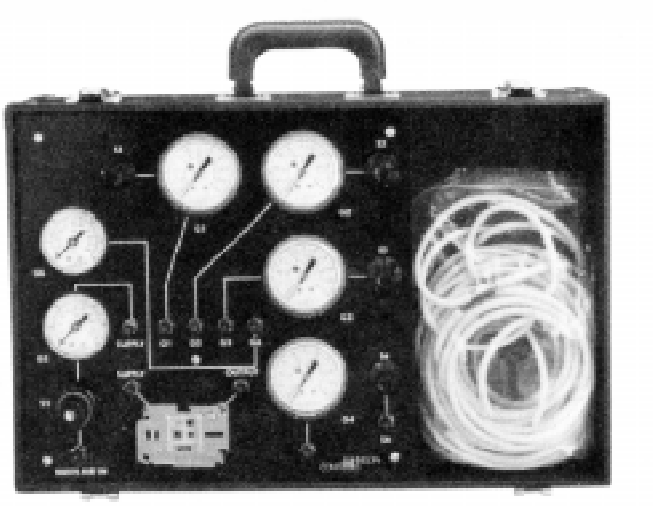

Fig. 1: JC 5383 Calibration Kit

T-5800 Series Receiver-Controllers Initial Setup (See Fig. 2)

Note: Use the rubber caps furnished with the JC 5383 Calibration Kit on all unused fittings on the kit to prevent leakage. Before proceeding with the following steps, disconnect the transmitter input lines.

1. Furnish supply air (20 to 90 psig) to the "MAIN AIR IN" connection of the calibration kit.

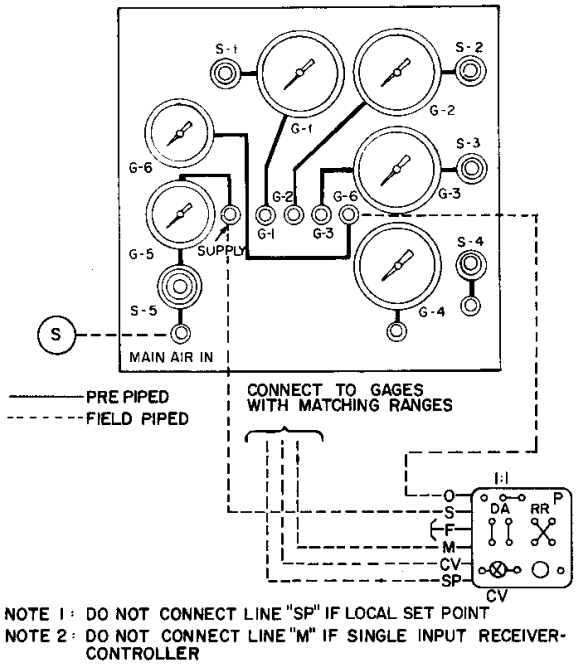

Fig. 2: T-5800 Receiver-Controller Initial Setup

Part No. 24-2384-8, Rev. C
Code No. LIT-7171325X

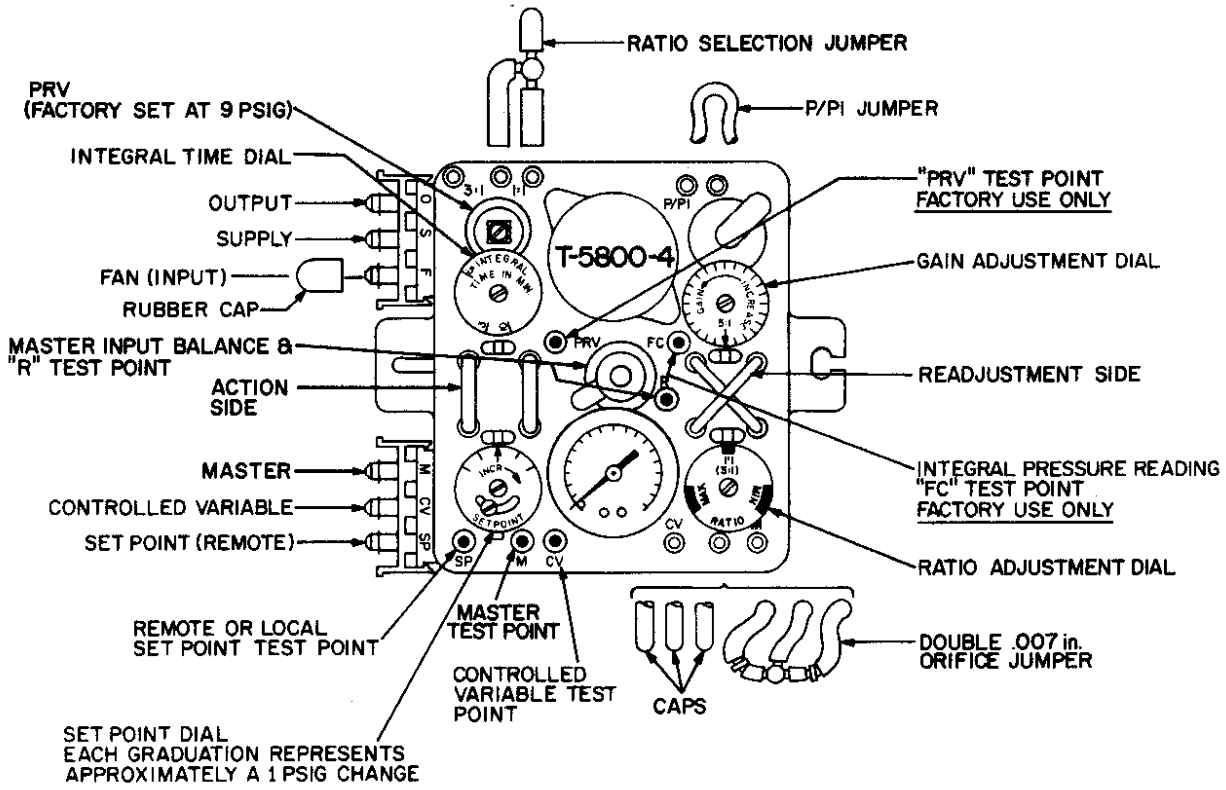

Fig. 3: Typical T-5800 Series Instrument

2. Set regulator S-5 to furnish 20 psig as read on G-5.
3. Using the "O/S/F" connector and tubing furnished with the kit, connect the supply line to the "SUPPLY" fitting and connect the output line to fitting G-6. (The fan "F" line is not used.)
4. Using the "M/CV/SP" connector and tubing, connect the input lines to the gage connections that match the ranges of the transmitters. Do not connect input "M" for single input receiver-controllers and do not connect input "SP" for units with local set point.
5. Install the furnished rubber caps on all unused fittings on the calibration kit to prevent leakage.
6. Remove the orifice jumper on the T-5800 (if connected) and cap these spigots with the black rubber caps provided with the T-5800.
7. Position the action and, if present, readjustment jumpers on the T-5800 for the proper action and readjustment per the job requirements.
8. For Proportional Plus Integral (PI) models, disconnect the PI jumper from one of its spigots since the PI function, as well as the gain, can only be checked and adjusted during actual system operation. Pulling the PI jumper off of one of its spigots causes the receiver-controller to operate as a proportional-only controller.

T-5800-1 & T-5800-2 Single Input Receiver-Controllers

Set Point Adjustment

1. Select the proper gage on the calibration kit to match the range of the controlled variable "CV" transmitter. Connect the gage chosen to the "CV" spigot on the T-5800.
2. Determine the set point required and rotate the gradual switch (for the gage chosen in Step 1) to this required value.
3. Adjust the set point (local or remote) until the output pressure of the T-5800 is at the mid spring range of the controller device.

CONTROLLING TRANSMITTER OR SENSOR

LOCATION HOT WATER

SPAN 200F° LIMITS 40 TO 240F

WORKING RANGE 100 X .06 = 6.0 Δ P

MASTER TRANSMITTER OR SENSOR

LOCATION OUTSIDE AIR

SPAN 100F° LIMITS 0 TO 100F

WORKING RANGE 100 X 12 = 12 ΔP

RATIO OR AUX. AUTH. .50

OUTSIDE AIR	HOT WATER
10	180
70	80

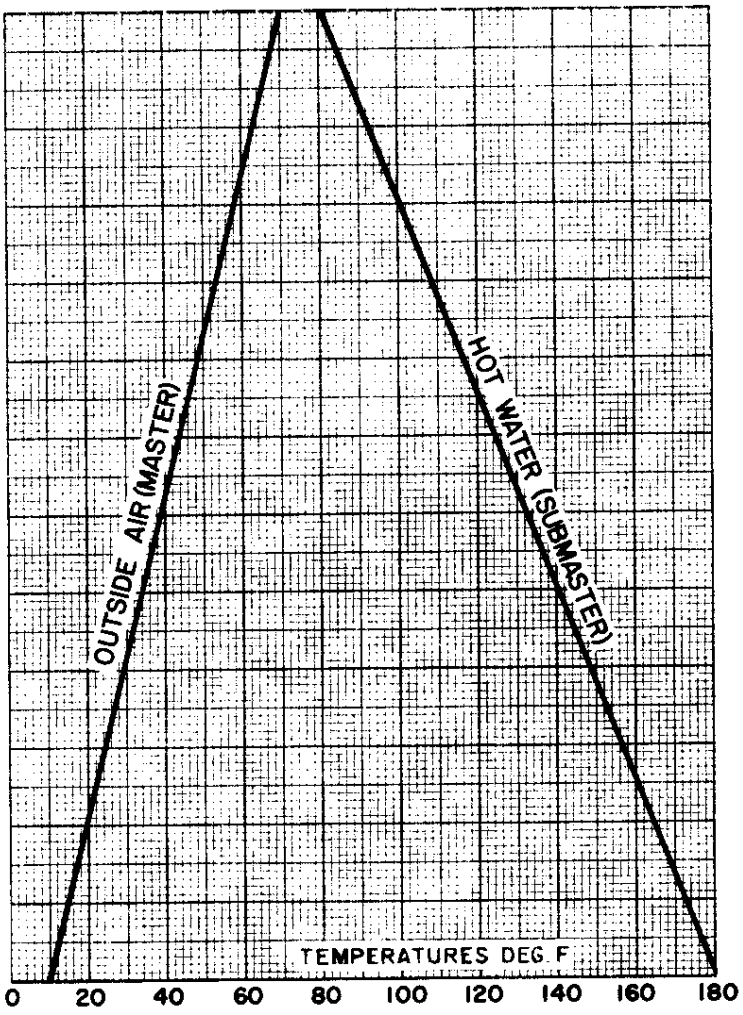

Fig. 4: Typical Reset Schedule

Gain Adjustment

4. The T-5800 must be connected to the actual control system to adjust the gain. Remove the receiver-controller from the calibration kit and reconnect the orifice jumper if previously removed.
5. Connect the T-5800 to the system, allow the system to come into control, and note the output pressure.
6. If the gain setting is specified on the control drawing, set the gain to this value. If not specified, increase the gain setting until the system becomes unstable and begins to cycle. Then decrease the gain setting slightly to remove the cycling effect.

Integral Time Adjustment (T-5800-2 Only)

7. Reconnect the PI jumper previously removed in order to restore the PI function to the T-5800-2.
8. If the system response toward the set point is too slow, decrease the integral time and/or increase the gain dial settings by small increments each. If cycling occurs, increase the integral time and/or decrease the gain dial settings by small increments each.

T-5800-3 & T-5800-4 Dual Input Receiver-Controllers

1. From the control drawing and reset schedule (Form 561), determine the minimum and maximum values of the master "M" and controlled variable "CV" transmitters. An example of a typical reset schedule is illustrated in Fig. 4.
2. Position the ratio selection jumper in the proper position as determined on the control drawing (Example: A ratio of .50 means install the jumper in the 1:1 position).

3. Connect the T-5800 to the calibration kit, matching the gage ranges on the kit to the corresponding master "M" and controlled variable "CV" transmitters (Example: 0 to 100°F and 40 to 240°F respectively).

Master Input Balance Adjustment ("R" Test Point)

4. Apply a simulated master "M" input pressure equal to the midpoint of the working range according to the reset schedule (Example: 40°F).
5. Connect the hypodermic needle test probe assembly to test gage G-4 on the calibration kit and insert the needle test probe into the master balance "R" test point on the T-5800. Adjust the master balance to 9 psig.
6. Remove the needle test probe from the "R" test point and insert it into the "SP" test point.
7. Set the local or remote set point adjuster to provide a 9 psig reading on test gage G-4. Remove the test probe from the T-5800.

Ratio Adjustment

8. With the master "M" input pressure still at the midpoint of the working range of the controlled device (Example: 40°F), apply a simulated controlled variable "CV" input pressure equal to the midpoint of its working range according to the reset schedule (Example: 130°F).
9. With the ratio jumper and dial in the 1:1 position, rotate the dial to the calculated ratio value for the specific application (Example: Ratio of .50).
10. Adjust the set point (local or remote) to produce an output pressure equal to the mid spring range of the controlled device(s).
11. Apply a simulated master "M" input pressure starting at the minimum value of the working range according to the reset schedule (Example: 10°F).
12. Apply a simulated controlled variable "CV" input pressure which corresponds to the minimum master value in Step 11 (Example: 180°F).
13. Determine what valve or damper position on the operating system would be necessary to produce the desired "CV" value in Step 12. Rotate the **RATIO DIAL** to produce this output pressure (Example: Approximately 6.5 psig assuming a N.O. valve for this application).
14. Adjust the simulated input values to the other end of the reset schedule (Example: Master "M" = 70°F, controlled variable "CV" = 80°F).
15. Determine what valve or damper position on the operating system would be necessary to produce the "CV" value in Step 14. Adjust the **SET POINT (LOCAL OR REMOTE)** to produce this output pressure (Example: Approximately 10.5 psig).

Gain Adjustment

16. The T-5800 must be connected to the actual control system to adjust the gain. Remove the receiver-controller from the calibration kit and reconnect the orifice jumper if previously removed.
17. Connect the T-5800 to the system, allow the system to come into control, and note the output pressure.
18. If the gain setting is specified on the control drawing, set the gain to this value. If not specified, increase the gain setting until the system becomes unstable and begins to cycle. Then decrease the gain setting slightly to remove the cycling effect.

Integral Time Adjustment (T-5800-4 Only)

19. Reconnect the PI jumper previously removed in order to restore the PI function to the T-5800-4.
20. If the system response toward the set point is too slow, decrease the integral time and/or increase the gain dial settings by small increments each. If cycling occurs, increase the integral time and/or decrease the gain dial settings by small increments each.

N-9000 Enthalpy Logic Center Operational Checkout

The N-9000 Enthalpy Logic Center is a fluidic instrument which has no adjustments. The procedure below is designed to verify proper operation. If the N-9000 does not pass the checks below, it must be replaced; field repairs cannot be made.

1. Connect the N-9000 to the calibration kit as illustrated in Fig. 5. The C-5226s are required to isolate the signals from the calibration kit.
2. Adjust the kit to the balance point as follows:

   Balance Point:
   Set T_{OA} = 12 psig
   Set T_{RA} = 12 psig
   Set H_{OA} = 9 psig
   Set H_{RA} = 9 psig
3. Gage G-6 should read less than 1 psig. If not, decrease T_{OA} until G-6 reads less than 1 psig. The decrease in T_{OA} should not exceed .25 PSI.

Check 1

Decrease T_{RA} until G-6 reads 10 psig or greater. The decrease in T_{RA} should not exceed 0.5 PSI. Rebalance the output to less than 1 psig and proceed to Check 2.

Check 2

Increase T_{OA} until G-6 reads 10 psig or greater. The increase in T_{OA} should not exceed 0.5 PSI. Rebalance the output to less than 1 psig and proceed to Check 3.

Check 3

Decrease H_{RA} until G-6 reads 10 psig or greater. The decrease in H_{RA} should not exceed 1.0 PSI. Rebalance the output to less than 1 psig and proceed to Check 4.

Check 4

Increase H_{OA} until G-6 reads 10 psig or greater. The increase in H_{OA} should not exceed 1.0 PSI.

Servicing the JC 5383 Calibration Kit

Periodically check the accuracy of all gages on the JC 5383 kit utilizing a good master test gage. It is recommended that a 4 to 6 in. test gage with an accuracy of 0.1 PSI be used.

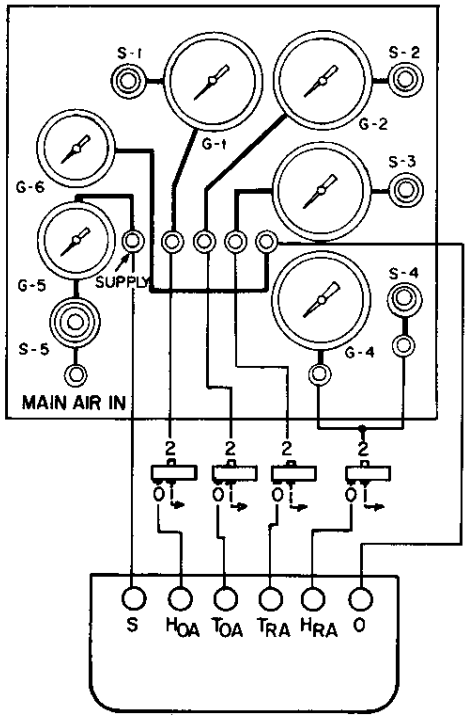

Fig. 5: N-9000 Setup

-- Repair Parts on Next Page -

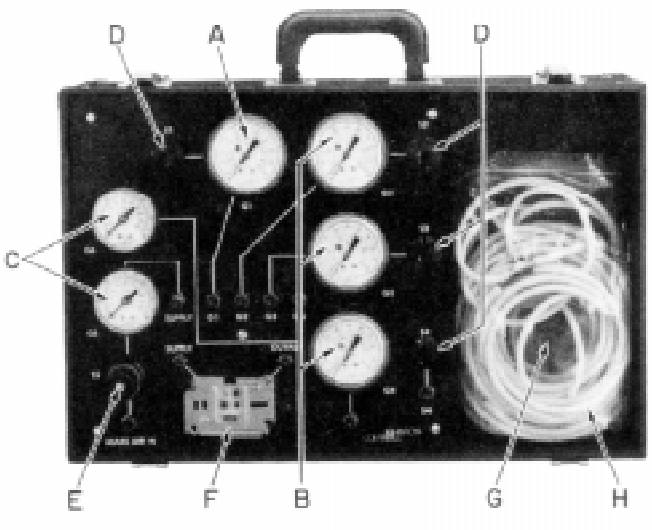

Fig. 6: JC 5383 Calibration Kit

Table 1: Repair Parts

Item	Description	Shipping Weight lb*	Code Number
A	Multi-Scale Transmission Gage: 50 to 150°F, 0 to 100°F 20 to 120°F, -40 to 160°F	0.4	JC 5385
B	Multi-Scale Transmission Gage: 60 to 85°F, 40 to 240°F, 40 to 65°F, 50 to 100°F	0.4	JC 5386
C	0 to 30 PSIG Gage	0.4	G-2010-101
D	Miniature Pressure Regulator	0.1	R-4000-3
E	Pressure Reducing Valve	0.5	R-130-1
F	Stat Mounting Equipment: Mounting Bracket	0.3	T-4002-124
	Terminal Connector with Two Straight Fittings	0.1	T-4002-122
G	Input/Output Connector Kit	.01	T-5800-600
H	Blue 1/4 in. O.D. Urethane Tubing (Order in Multiples of 100 ft.)	2.0	F-1000-231

***lb x 0.454 = kg**

Notes

Notes

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