26-B-1 BRAKE VALVE

The 26-B-1 brake valve is a self-lapping, automatic brake valve arranged for use with automatic pressure brake equipment. The brake valve includes the necessary interlocks to provide for safety control function, double end operation, dead engine charging and auxiliary control features.

The automatic brake valve portion contains a handle with internal quadrant that operates through the following positions:

1. Release Position.

   In this position, brake pipe (port 1) and equalizing reservoir (port 5) are charged to full brake pipe pressure; main reservoir pressure (port 30) is admitted to the switch pipe (port 3); and the emergency switch pipe (port 12), the lockover port (port 8) and the suppression pipe (port 26) are vented to atmosphere.

2. Service Position.

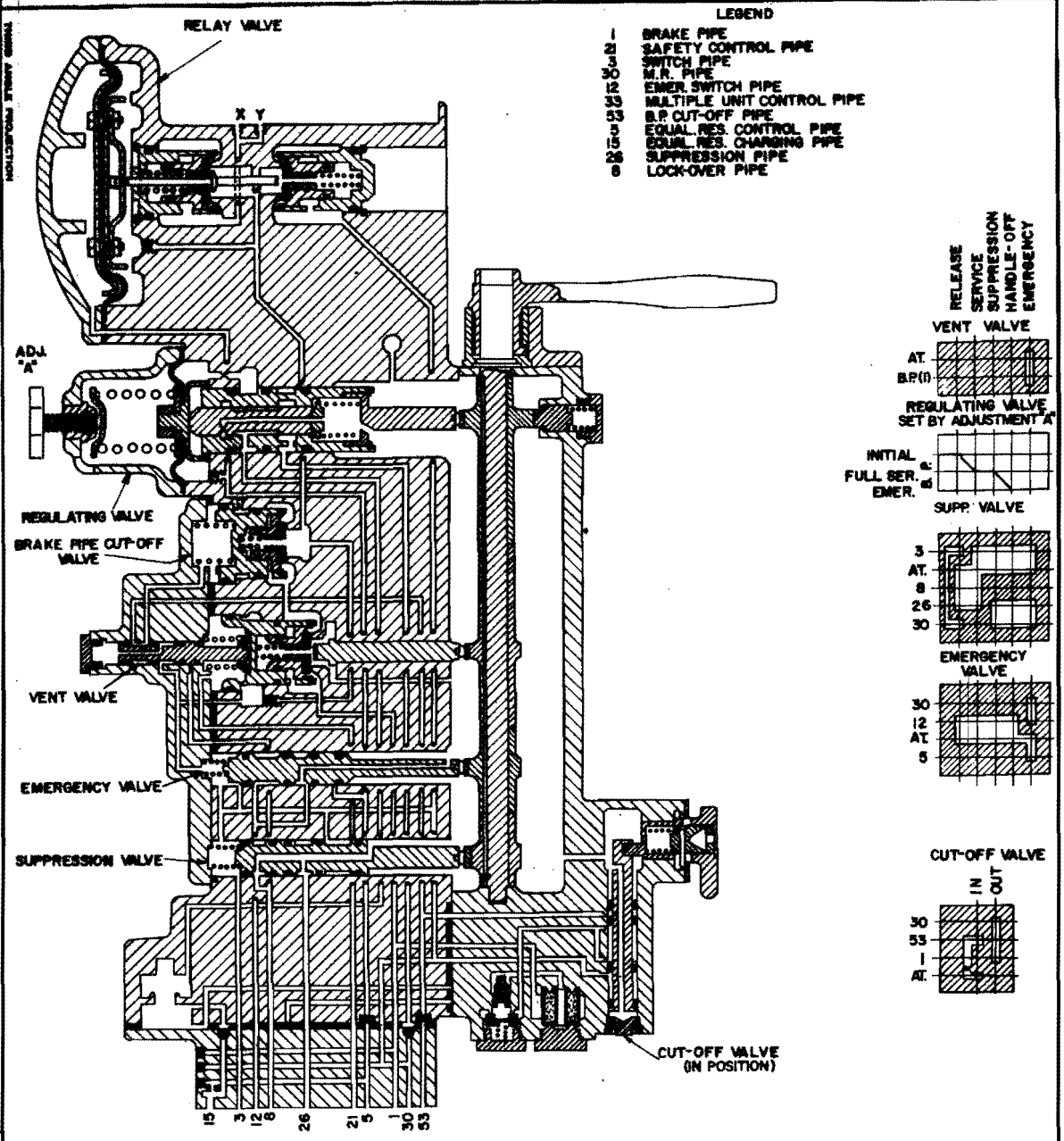
   This position consists of a sector of the handle movement which regulates brake pipe pressure and equalizing reservoir pressure to a pressure lower than Release Position pressure. The intensity of the pressure reduction is increased as the handle is moved to the right. In this position, the switch pipe (port 3), the lockover pipe (port 8), the suppression pipe (port 26) and the emergency switch pipe (port 12) are vented to atmosphere.

3. Suppression Position.

   In this position, the brake pipe and equalizing reservoir pressures have been reduced to a normal, full service reduction. Nullification of a safety control application is obtained in this position by the lockover port (port 8) being blanked, and suppression is accomplished in this position by admitting main reservoir pressure (port 30) to the suppression pipe (port 26). In this position, the switch pipe (port 3) and the emergency switch pipe (port 12) are opened to atmosphere.

4. Handle-off Position.

   In this position, the brake pipe and equalizing reservoir pressures are reduced to zero. Otherwise, the various valves are positioned to make the same connections described under Suppression Position.



REVISIONS

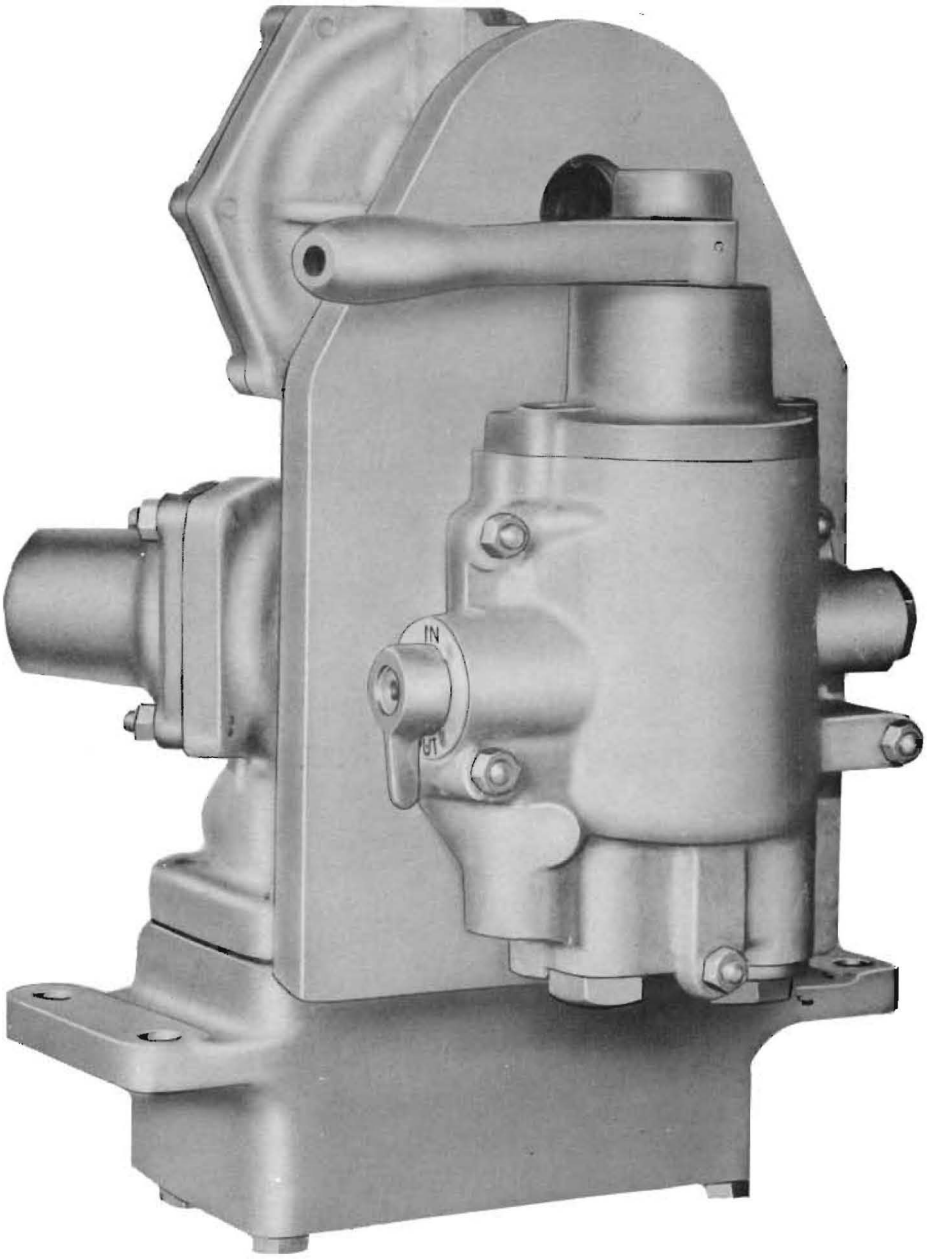
THIRD ANGLE PROJECTION

SCALE	MATERIAL	FINISH	PIECE NO.	NEXT ASS'Y NO.	
SURFACE FINISH (MIL. STD. MAX.)					
TOLERANCES NOT SPECIFIED ON DWG.					

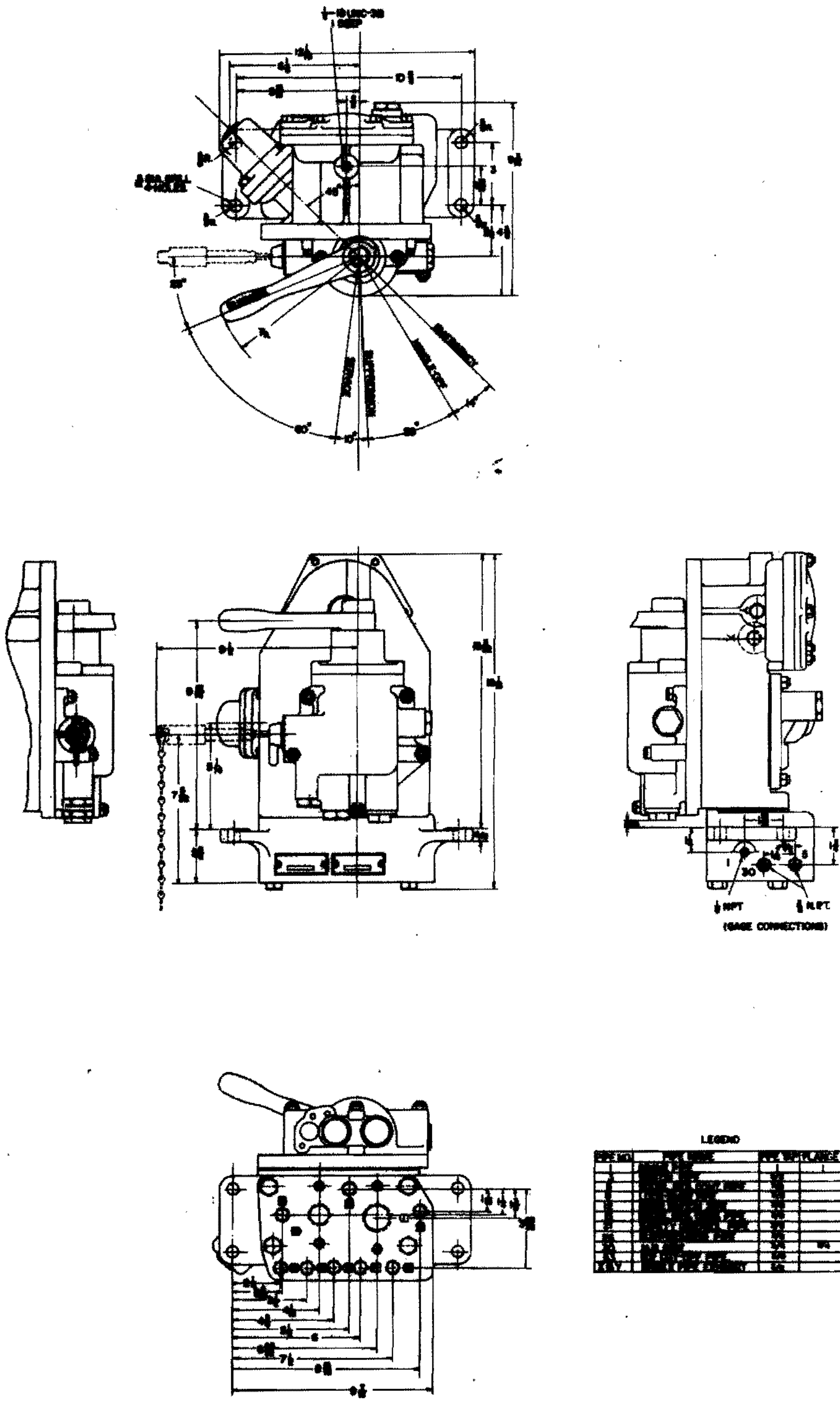
SIZE C	A80941-109			
DESIGN C.W.L.	WESTINGHOUSE AIR BRAKE CO. AIR BRAKE DIVISION WILMERDING, PA., U.S.A.			
DRAWN				
TRACED	28 B-1 BRAKE VALVE DIAGRAMMATIC			
CHECKED				
DATE 2-27-54				

3078

CA-80941-109



26B-1 BRAKE VALVE



LEGEND

PIPE NO.	PIPE NAME	PIPE SIZE	FLANGE SIZE
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	
KEY	[illegible]	[illegible]	

5. Emergency Position.

In this position, brake pipe is vented at an emergency rate, and equalizing reservoir is connected to atmosphere. The switch pipe (port 3) is connected to atmosphere, and the suppression pipe (port 26) is connected to main reservoir pressure as in Suppression and Handle-off Positions. Main reservoir pressure in this position is admitted to the emergency switch pipe (port 12).

The automatic brake valve portion consists of the following details:

1. Controlair Valve.

This valve is operated by a cam on the brake valve handle shaft to regulate changes in pressure in the equalizing reservoir. With the handle in Release Position, equalizing reservoir pressure is increased until it reaches the pressure that has been determined through the adjustment of knob "A" on the Controlair valve. Since equalizing reservoir pressure, in this brake valve, serves as a control for brake pipe pressure, the adjustment of equalizing reservoir pressure at knob "A" serves to set the desired brake pipe pressure, similar to the adjustment of a feed valve in previous equipments. Inasmuch as the Controlair valve is a self-lapping valve, equalizing reservoir pressure will be maintained at the desired pressure as determined by the position of the brake valve handle.

2. Relay Valve.

The relay valve of the 26-B-1 brake valve serves to regulate the brake pipe to the same pressure as the equalizing reservoir at all times. The relay valve is a self-lapping type valve and will automatically close the exhaust valve and open the supply valve to admit main reservoir air to the brake pipe when the equalizing pressure on the diaphragm increases; close the supply valve and open the exhaust valve to vent brake pipe pressure when equalizing reservoir pressure on the diaphragm is reduced, or assume a Lap Position with both exhaust and supply valves closed when equalizing reservoir pressure remains constant and brake pipe pressure has reached equalizing pressure. Since the relay valve portion is a self-lapping type valve, brake pipe pressure will be maintained against leakage in all positions in which there is any equalizing reservoir pressure on the face of the diaphragm.

3. Brake Pipe Cut-off Valve.

The brake pipe cut-off valve serves to interrupt the flow of air from the relay valve at any time that main reservoir pressure is admitted to the large spring cavity of the brake pipe cut-off valve. This occurs when the cut-off valve has been moved to cut-out position in which case main reservoir air is looped through the cut-off valve, through the spool valve on the end of the vent valve and to the cavity behind the vent valve. This can also occur whenever the vent valve has been caused to move from its closed position to a venting position, in which case the spool valve on the end of the vent valve will move to connect main reservoir air to the back face of the brake pipe cut-off valve.

4. Vent Valve.

The primary purpose of the vent valve is to provide an opening large enough to reduce brake pipe pressure at an emergency rate when the valve has been opened. The vent valve is forced open, through a cam on the brake valve handle shaft, when the brake valve handle is moved to Emergency Position, or when air from the back face of the vent valve is exhausted through the brake pipe safety control pipe (port 21). A spool valve, connected to the vent valve, moves, whenever the vent valve moves, to connect main reservoir air to the back face of the brake pipe cut-off valve. This interlock insures that the supply to the brake pipe is closed whenever the vent valve is open to exhaust brake pipe air.

5. Emergency Valve.

The emergency valve is operated from a cam on the brake valve shaft in Emergency Position only, in which position a connection is made to insure that equalizing reservoir pressure will be exhausted to zero pressure at a rapid rate. Another connection is also made in this portion to admit main reservoir pressure (port 30) to the emergency switch pipe (port 12) when the brake valve handle has been moved to Emergency Position.

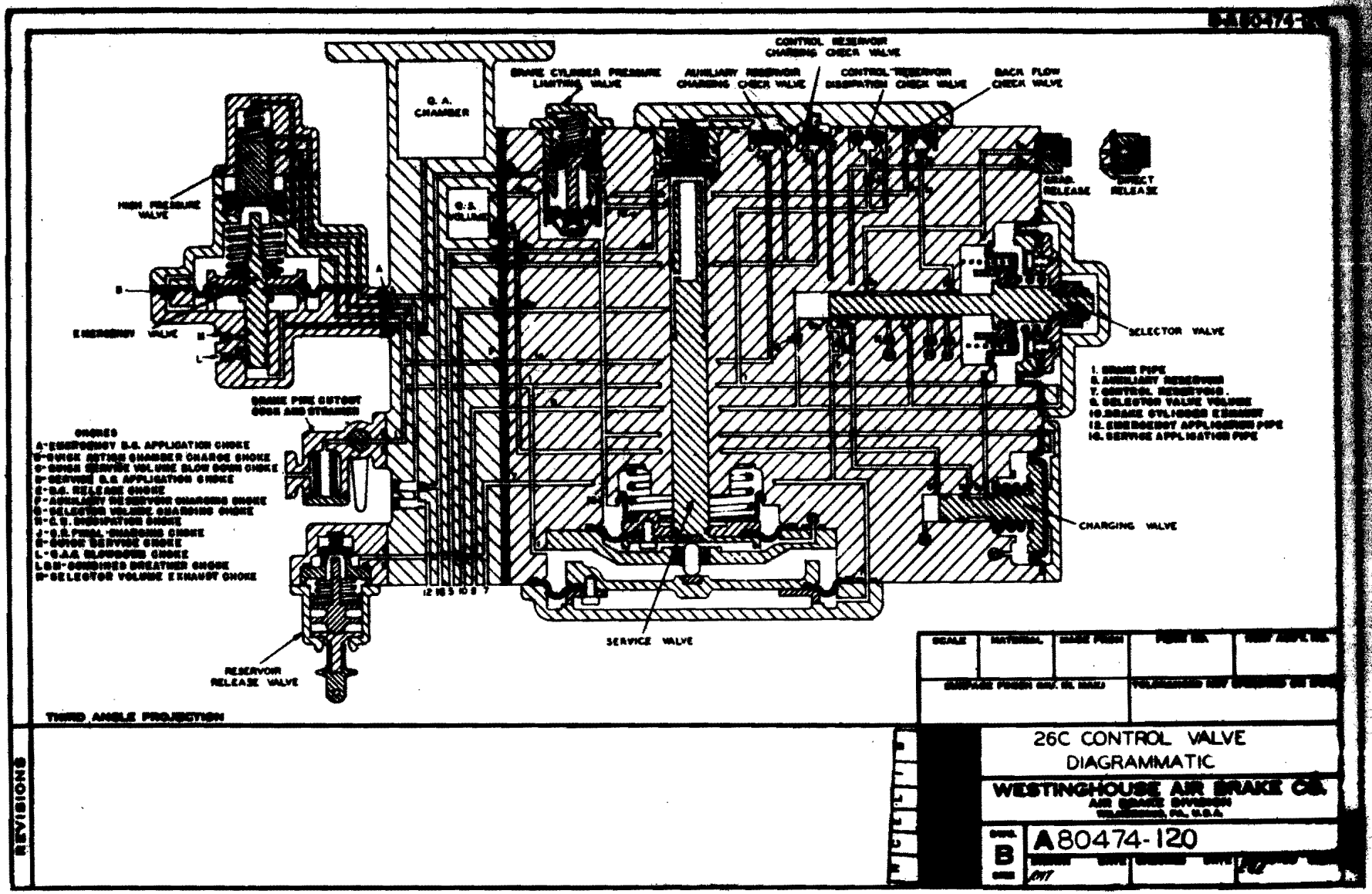
6. Suppression Valve.

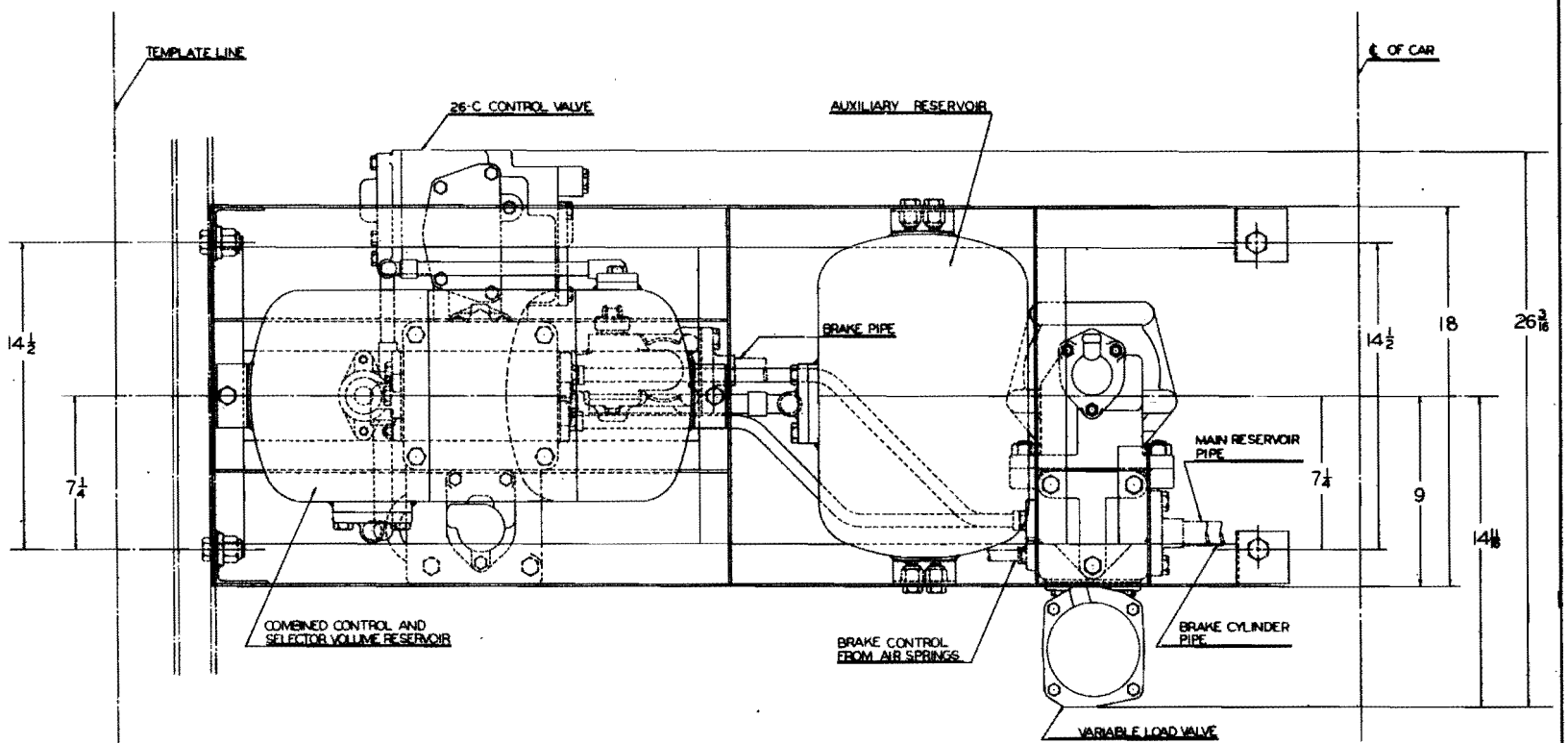
The primary purpose of the suppression valve is to provide the interlocks necessary for suppression. The lockover pipe (port 8) is open to atmosphere at the suppression valve in Release and Service Positions but is blanked during Suppression, Handle-off and

Emergency Positions, which makes it necessary for the operator to move the brake valve handle beyond full Service Position in order to blank Port 8. The suppression pipe (port 26) is open at the suppression valve to atmosphere in Release and Service Positions, but a connection is made in Suppression, Handle-off and Emergency Positions to admit main reservoir pressure to that pipe, insuring that suppression cannot be obtained until the brake valve handle has been moved beyond the Full Service Position. The suppression valve also makes a connection for main reservoir air to flow to the switch pipe (port 3) while the handle is in Release Position, but that connection is broken immediately as the handle is moved toward the Service Position.

7. Cut-off Valve.

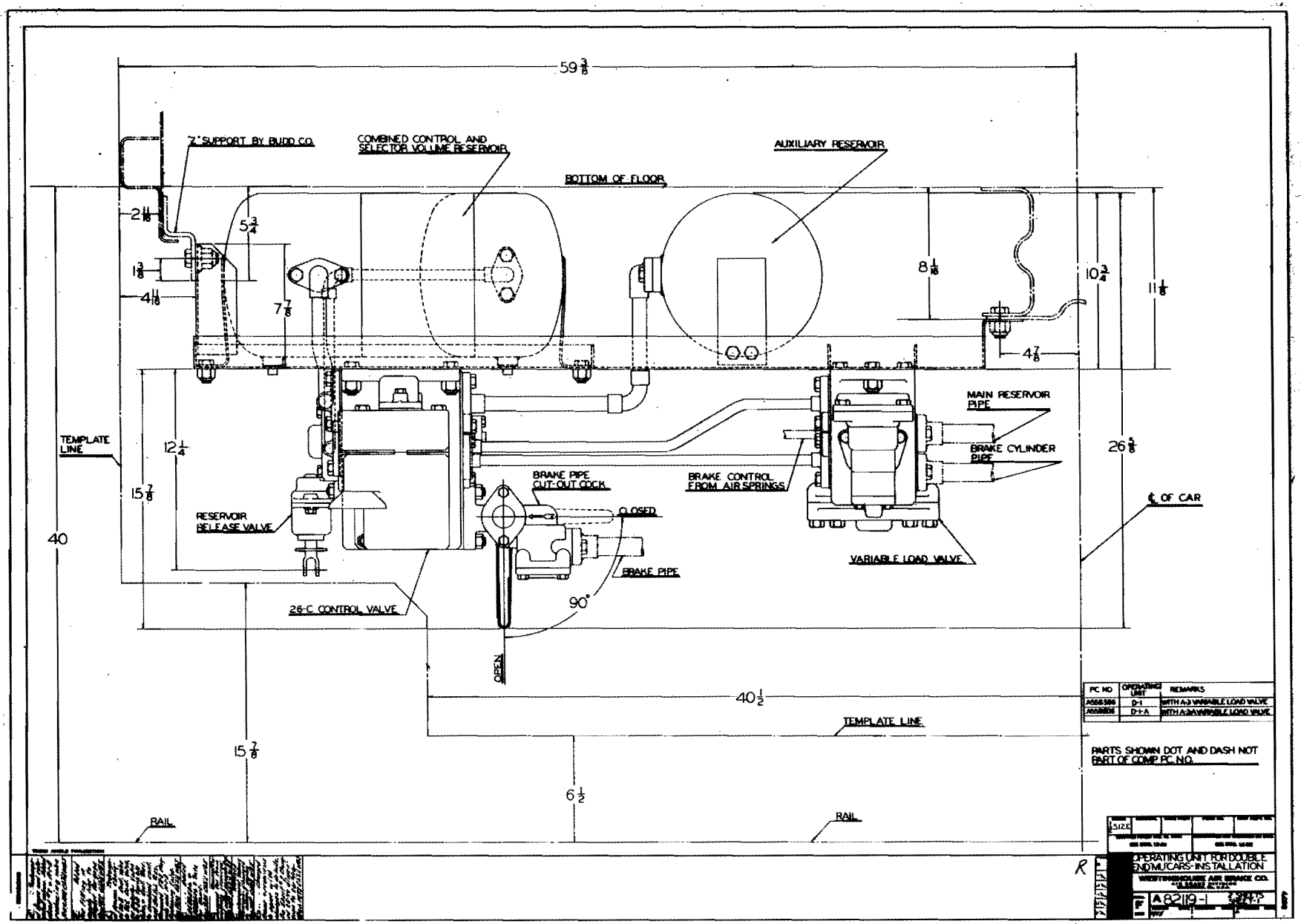
The cut-off valve is moved by turning a knob to position that valve to either Passenger Position or Cut-out Position. When the train is to be operated from a certain brake valve, the cut-off valve on that brake valve is turned to Passenger Position. In this position, the cut-off valve makes no interlocks other than to provide a choked opening to atmosphere for the brake pipe cut-off pipe (port 53) to insure that pressure will not build up on the back face of the brake pipe cut-off valve to close that valve. When the train is to be operated from some other brake valve, the cut-off valve is turned to Cut-out Position, in which case main reservoir and brake pipe pressure are connected to the brake pipe cut-off pipe to insure that the brake pipe will not be supplied from the relay portion of that brake pipe. Main reservoir and brake pipe are connected in this position to provide a means for the reservoirs to be charged from brake pipe through a choke, check valve, and strainer in the pipe bracket for hauling the car dead in the train. The cut-off valve is so arranged with a lock that it can be operated only by first inserting a special instrument in the cut-off valve. This lock is provided to prevent operating of the cut-off valve by an unauthorized person.


CONTROL RESERVOIR CHARGING CHECK VALVE
BRAKE CYLINDER PRESSURE LIMITING VALVE
AUXILIARY RESERVOIR CHARGING CHECK VALVE
CONTROL RESERVOIR DISSIPATION CHECK VALVE
BACK FLOW CHECK VALVE
G.A. CHAMBER
G.A. VOLUME
HIGH PRESSURE VALVE
GRAD. RELEASE
DIRECT RELEASE
SELECTOR VALVE
1. BRAKE PIPE
5. AUXILIARY RESERVOIR
7. CONTROL RESERVOIR
9. SELECTOR VALVE VOLUME
10. BRAKE CYLINDER EXHAUST
12. EMERGENCY APPLICATION PIPE
16. SERVICE APPLICATION PIPE
CHOKES
A - EMERGENCY B.C. APPLICATION CHOKE
B - QUICK SERVICE CHAMBER CHARGE CHOKE
D - QUICK SERVICE VOLUME BLOW DOWN CHOKE
E - SERVICE B.C. APPLICATION CHOKE
G - B.C. RELEASE CHOKE
F - AUXILIARY RESERVOIR CHARGING CHOKE
H - SELECTOR VOLUME CHARGING CHOKE
K - C.R. DISSIPATION CHOKE
J - G.A. FINAL CHARGING CHOKE
M - QUICK SERVICE CHOKE
L - G.A.A. CHARGING CHOKE
LBB - COMBINED BREATHER CHOKE
N - SELECTOR VOLUME EXHAUST CHOKE
BRAKE PIPE STRAINER
CHARGING VALVE
SERVICE VALVE
RESERVOIR RELEASE VALVE
THIRD ANGLE PROJECTION
SCALE
MATERIAL
FINISH
PART NO.
DRAWING NO.
SURFACE FINISH UNLESS OTHERWISE STATED
TOLERANCES UNLESS OTHERWISE STATED
REVISIONS
26C CONTROL VALVE
DIAGRAMMATIC
WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U.S.A.
SIZE B
A80474-120



OPERATING UNIT FOR DOUBLE DOMI CARS INSTALLATION

A82119


59 3/8
2" SUPPORT BY BUDD CO.
COMBINED CONTROL AND SELECTOR VOLUME RESERVOIR
AUXILIARY RESERVOIR
BOTTOM OF FLOOR
2 11/16
5 3/4
1 3/8
4 11/16
7 7/8
8 1/16
10 3/4
11 5/8
4 7/8
MAIN RESERVOIR PIPE
BRAKE CYLINDER PIPE
26 5/8
TEMPLATE LINE
12 1/4
15 7/8
BRAKE PIPE CUT-OUT COCK
CLOSED
BRAKE CONTROL FROM AIR SPRINGS
℄ OF CAR
RESERVOIR RELEASE VALVE
40
VARIABLE LOAD VALVE
BRAKE PIPE
90°
26-C CONTROL VALVE
OPEN
40 1/2
TEMPLATE LINE
15 7/8
6 1/2
RAIL
RAIL
PC NO
OPERATING UNIT
REMARKS
D-1
WITH A-3 VARIABLE LOAD VALVE
D-1-A
PARTS SHOWN DOT AND DASH NOT PART OF COMP PC NO.
SIZE
OPERATING UNIT FOR DOUBLE END MU CARS-INSTALLATION
A82119-1
R

26-C CONTROL VALVE

The 26-C control valve is a device designed for use on a passenger car to control the flow of air to or from brake cylinders on that car in response to the amount of increase or decrease in brake pipe pressure. The control valve consists of a pipe bracket on which are mounted a service portion, a vent valve portion, a brake pipe cut-out cock and strainer portion, and a reservoir release valve portion. Although not a part of the device itself, an auxiliary reservoir, a control reservoir, and a selector valve volume reservoir are required to complement the functions of the 26-C control valve.

The auxiliary reservoir supplies air to the brake cylinders, or to the brake cylinder relay valves when used, during service and emergency brake applications. The size of the auxiliary reservoir is selected to provide the desired emergency equalization pressure.

The function of the control reservoir pressure is to provide a reference force to move the service valve in the service portion of the 26-C control valve when a reduction occurs in the opposing brake pipe pressure.

The selector valve reservoir supplies air for operation of the selector valve during quick service and graduated release operations.

SERVICE PORTION

The service valve is shown in fully charged and Release Position. In this position, control reservoir pressure at full brake pipe pressure is opposed by brake pipe air also at full brake pipe pressure. The valve is held in Release Position through the force of a spring acting in the direction of brake pipe pressure. When air pressure in the brake pipe has been reduced to a point sufficient to permit control reservoir pressure on the face of the large diaphragm to move the service valve, the stem of the service valve will unseat a rubber check valve, permitting air from the auxiliary reservoir (port 5) to flow to the service application pipe (port 4). Air from the auxiliary reservoir also flows to the spring side of the smaller diaphragm in the service valve, creating an additional force opposing the control reservoir pressure. When the combined forces of the spring, the now reduced brake pipe pressure on the face of the large diaphragm, and the service application pipe pressure on the face of the small diaphragm slightly exceed the force of the control reservoir pressure across the face of the large diaphragm, the service valve will be forced down until the rubber seated check valve can become seated and close communication from the auxiliary reservoir to the service application pipe.

With the direct and graduated release cap on the service portion turned to graduated Release Position, the pressure in the service application pipe can be reduced in small increments by increasing brake pipe pressure in small increments. With the service valve in the upward or applied position, a slight increase in brake pipe pressure will force the service valve downward, until the end of the service piston moves away from the rubber seated check valve. Air in the service application pipe will then be permitted to flow through a cavity in the end of the service valve stem to connect with the exhaust port (port 10). Since pressure in the service application pipe has been reduced, the force of the service application pipe pressure on the face of the small diaphragm will also be reduced until the force of the control reservoir pressure across the face of the large diaphragm can move the service valve back to the position where the rubber check valve will close the opening in the service valve stem and prevent the flow of additional service application pipe air to atmosphere. At this point, the service valve will have assumed a Lap Position with the rubber seated check valve closing communication from the auxiliary reservoir to the service application pipe through the service valve to atmosphere. Small reductions in service application pipe pressure can be made in this manner until brake pipe pressure has been restored to within a few pounds of the full brake pipe pressure, at which time the service valve will move to Release Position.

With pressure in the service application pipe, full release can be obtained with a slight increase in brake pipe pressure if the graduated and direct release cap on the service portion is turned to Direct Release Position. With the cap in this position, a connection is made through choke "H", past the check valve in the cap, and past the rubber seated "control reservoir dissipation check valve" to brake pipe. When pressure is increased in the brake pipe, the selector valve will move to a position permitting control reservoir air to flow in the path described above. At the time brake pipe pressure is forcing the service valve to move to Releae Position, pressure in the control reservoir is also being reduced to equalization with the present brake pipe pressure, permitting the spring in the service valve to hold that valve in its Release Position. The air pressure in the service application pipe is thereby reduced to atmospheric pressure without any graduations.

Quick service function of the 26-C control valve is controlled by the selector valve. Initial reduction in brake pipe pressure causes the selector valve to vent brake pipe air from the spring chamber of the selector valve to the quick service volume to propagate a service

application. Quick service activity will continue to vent brake pipe to atmosphere until cut off at the charging valve by development of service application pipe pressure. The selector valve also functions during a service brake application to isolate the control reservoir.

The charging valve in the service portions provides the function of ending quick service activity. It also functions to cut off breathing action of the control reservoir with brake pipe during a graduated release action of the control valve.

Provision is made to dissipate slight excess of pressure in the control reservoir, auxiliary reservoir, and selector valve reservoir to brake pipe pressure. In Release Position, control reservoir air is free to flow through the selector valve, through the charging valve, and through choke "J" to brake pipe. Since air from both auxiliary reservoir and selector valve reservoir is free to flow to control reservoir, the excessive pressure in those reservoirs can also be dissipated in the same manner.

Since an emergency reservoir is not required with the 26-C control valve, the auxiliary reservoir is of such a size as to provide the necessary pressure required in an emergency application. In order to limit brake cylinder pressure as a result of a service application to full service value, a "brake cylinder pressure limiting valve" is included in the 26-C control valve service portion. The brake cylinder pressure limiting valve permits service application pipe air to pass through that valve until the desired maximum pressure is reached, at which time the service application pipe pressure will force the brake cylinder pressure limiting valve to a closed position, interrupting the flow of air from the auxiliary reservoir.

VENT VALVE PORTION

The vent valve portion of the 26-C control valve provides a local large opening for exhaust of brake pipe air to atmosphere during an emergency application and also provides an alternate passage of auxiliary reservoir to the emergency application pipe (port 12). The vent valve portion is so constructed that quick action chamber air can be exhausted at a spool valve at the same rate brake pipe air is reduced during a service application, but if the brake pipe pressure is reduced at a faster rate, quick action chamber pressure will force the vent valve to move the high pressure valve and exhaust brake pipe pressure locally. With brake pipe pressure exhausted locally, the vent valve will remain in its upper position until quick action chamber has been completely exhausted, thus insuring that the valve venting brake pipe to atmosphere is held open for a predetermined length of time.

During an emergency application, the quick action chamber pressure will force the high pressure valve to move to compress its spring and make a connection from auxiliary reservoir to the emergency application pipe. If separate control of brake cylinder pressure in emergency is desired, this can be obtained by placing that control in the emergency application pipe, since the pressure in that pipe will rise to the full equalization pressure of auxiliary reservoir to the predetermined displacement volume. If such control of the emergency pressure is not desired, a plugging arrangement can be changed in the pipe bracket to permit equalization of auxiliary reservoir air to the service application pipe, by-passing the brake cylinder pressure limiting valve in the service portion.

BRAKE PIPE CUT-OUT PORTION

The brake pipe cut-out cock and strainer portion provides a means of straining the air that will flow to the 26-C control valve and also provide a means of cutting out that control valve when desired.

RESERVOIR RELEASE VALVE PORTION

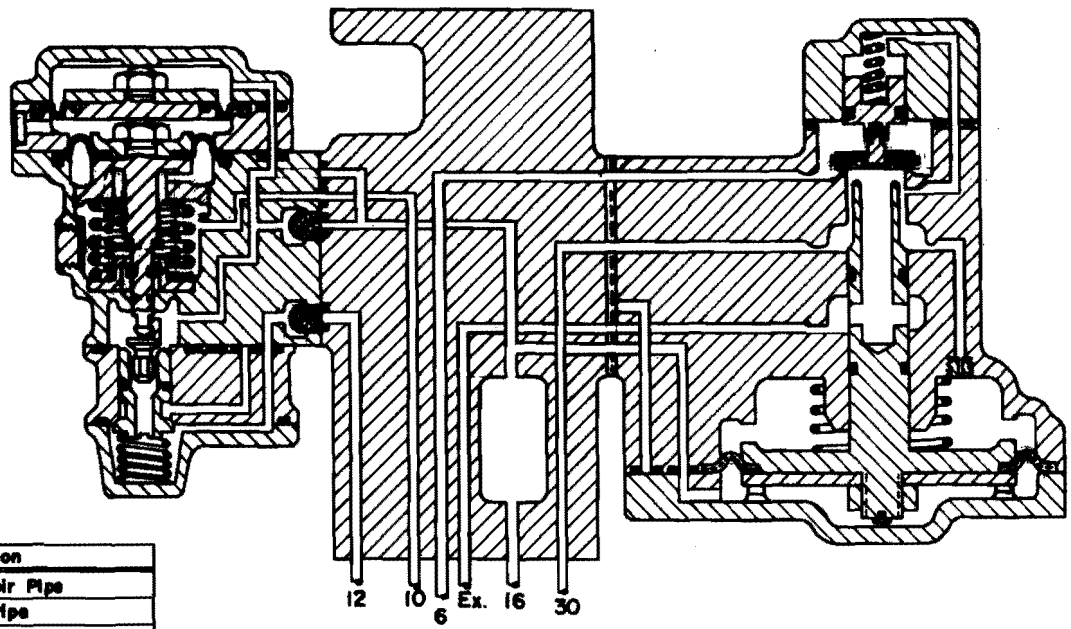
The reservoir release valve portion provides a means of manually venting control reservoir pressure to atmosphere. Inasmuch as both the selector valve volume reservoir air and auxiliary reservoir air are free to flow to the control reservoir, all three reservoirs can be vented by operation of the single reservoir release valve.

A-3 VARIABLE LOAD VALVE

The A-3 variable load valve consists of a pipe bracket, a variable load valve portion and a "J" type relay valve. When an emergency application is initiated, the variable load valve will limit the brake cylinder pressure in proportion to the air spring bellows pressure which is affected by the passenger loading of the car. The necessary air pressure is supplied to the brake cylinders to provide the emergency retardation rate desired. A "J" type relay valve receives the pressure from the variable load valve portion, and, in turn, permits main reservoir air to flow to the brake cylinders in accordance with the resultant pressure differentials of the variable load valve portion. The A-3 variable load valve portion has two diaphragms which yield a ratio of pressure between the air spring bellows and the application pipe. This ratio is achieved because of the effective areas of the diaphragms. It should be noted that the variable load valve portion does not effect the relay valve portion when a service brake application has been initiated.

The "J" type relay valve is a diaphragm operated, self-lapping valve which functions to supply and exhaust brake cylinder air pressure during brake applications. Application air pressure is admitted to the face of a diaphragm, causing movement of the piston and piston stem. The piston stem opens the check valve, thus allowing supply air to flow to the brake cylinders and also to the spring side of the diaphragm. Brake cylinder air pressure, combined with the spring pressure, opposes the movement of the piston as initiated by the application air pressure. An equalization of pressure across the diaphragm piston positions the valve stem to allow the check valve to seat and also to allow the valve to remain in the Lap Position. A reduction of the application air pressure initiates the movement of the diaphragm and piston stem, thus permitting the brake cylinder air pressure to exhaust from the relay valve. A graduated release of the brake cylinder pressure may also be obtained whenever the application air pressure is partially released. The pressure differential across the diaphragm positions the stem to exhaust the brake cylinder air pressure. When brake cylinder pressure is reduced sufficiently on the spring side of the diaphragm, equalization of pressure again occurs across the diaphragm and the valve moves to its Lap Position.

BA 82591-101



LEGEND

Port No.	Description
6	Main Reservoir Pipe
10	Air Spring Pipe
12	Emergency Application Pipe
16	Service Application Pipe
30	Brake Cylinder Pipe
Ex	Exhaust Pipe

SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASS'Y. NO.
			E-E6670	
SURFACE FINISH (MU. IN. MAX.)			TOLERANCES NOT SPECIFIED ON DWG.	

REVISIONS

A-3 VARIABLE LOAD VALVE

DIAGRAMMATIC

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U. S. A.

DWG. B SIZE

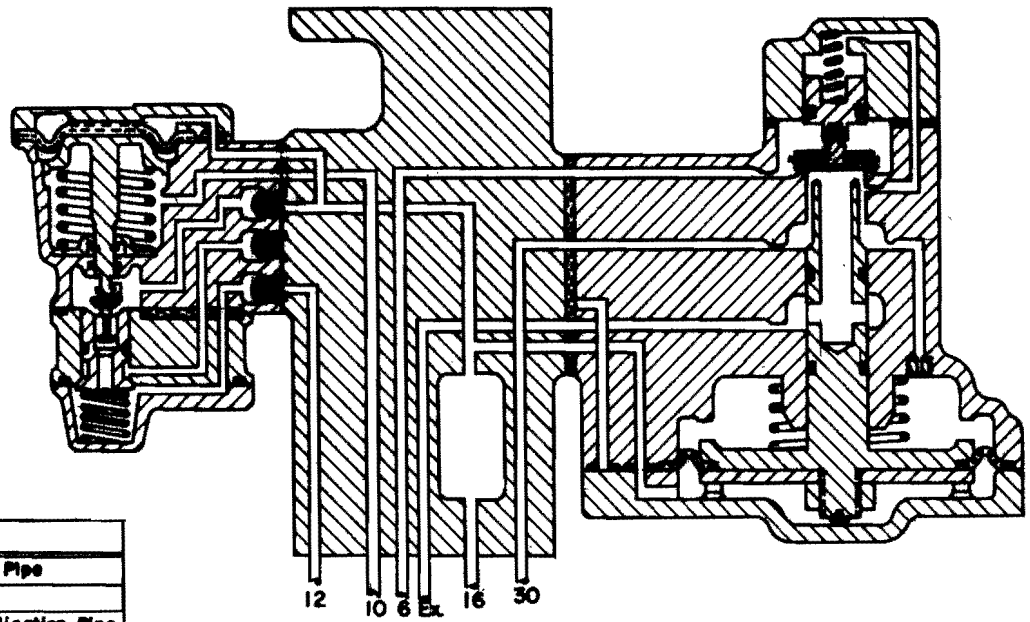
A 82591-101

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE

A-3-A VARIABLE LOAD VALVE

The A-3-A variable load valve consists of a pipe bracket, variable load valve portion and a "J" type relay valve portion. When an emergency application is initiated, the variable load valve will limit brake cylinder pressure in proportion to the air spring bellows pressure, which is affected by the passenger loading of the car. The necessary air pressure is supplied to the brake cylinders to provide the emergency retardation rate desired. The relay valve portion receives the pressure from the variable load valve, and, in turn, permits main reservoir air to flow to the brake cylinders in accordance with the resultant pressure differentials of the variable load valve portion. It should be noted that the variable load valve portion does not effect the relay valve portion during a service brake application.

The "J" type relay valve is a diaphragm-operated, self-lapping valve which functions to supply and exhaust brake cylinder air pressure during brake applications. Application air pressure is admitted to the face of the diaphragm, causing movement of the piston and stem. The piston stem opens the check valve, thus allowing supply air to flow to the brake cylinders and also to the spring side of the diaphragm. The brake cylinder air pressure, combined with the spring pressure, opposes the movement of the piston as initiated by the application air pressure. An equalization of pressure across the diaphragm piston positions the valve stem to allow the check valve to seat and also to allow the valve to remain in the Lap Position. A reduction of the application air pressure initiates the movement of the diaphragm and piston stem, thus permitting the brake cylinder air pressure to exhaust from the relay valve. A graduated release of the brake cylinder pressure may be obtained whenever the application air pressure is partially released. The pressure differential across the diaphragm positions the stem to exhaust the brake cylinder air pressure. When brake cylinder pressure is reduced sufficiently on the spring side of the diaphragm, equalization of pressure again occurs across the diaphragm and the valve moves to its Lap Position.



LEGEND

Part No.	Description
6	Main Reservoir Pipe
10	Air Spring Pipe
12	Emergency Application Pipe
16	Service Application Pipe
30	Brake Cylinder Pipe
Ex.	Exhaust Pipe

SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASSY. NO.
			E-F8870	
SURFACE FINISH (MU. IN. MAX.)			TOLERANCES NOT SPECIFIED ON DWG.	

REVISIONS

A-3-A VARIABLE LOAD VALVE
DIAGRAMMATIC

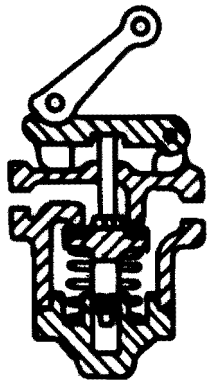
WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U.S.A.

DWG. SIZE	A 82591-102				
B	DRAWN	DATE	CHECKED	DATE	APPROVED

B-3-B EMERGENCY BRAKE VALVE

The B-3-B emergency brake valve is a small capacity valve and is a manually operated device. Pulling the cord or lever will unseat the piston valve and vent air pressure in the pipe to which the B-3 valve is attached.

A-A 50260-100



B.M. A-1937

SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASS'Y. NO.
			A88566	
SURFACE FINISH (MU. IN. MAX.)			TOLERANCES NOT SPECIFIED ON DWG.	

THIRD ANGLE PROJECTION

REVISIONS

C		
	L	
	I	
	E	
	C	
	N	

B-3-B CONDUCTOR'S VALVE
DIAGRAMMATIC

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U.S.A.

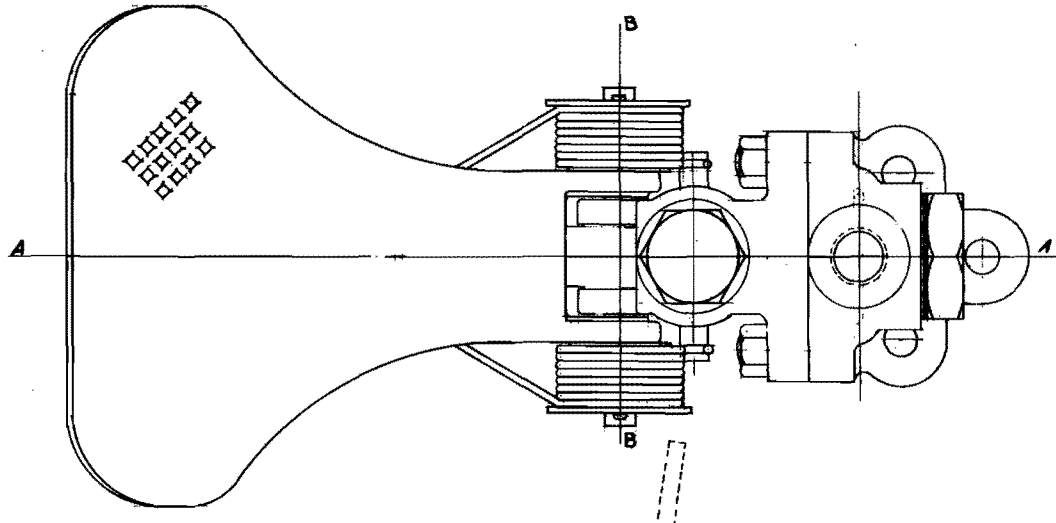
DWG. SIZE	A50260-100		
A	DRAWN DATE	CHECKED DATE	APPROVED DATE

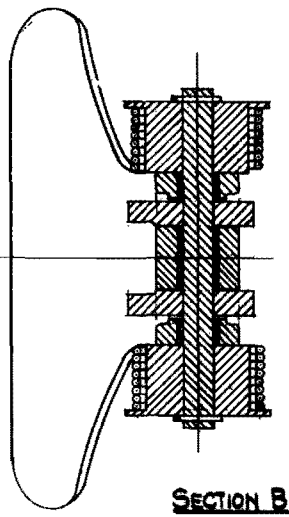
2947A

TYPE "C" DIAPHRAGM FOOT VALVE

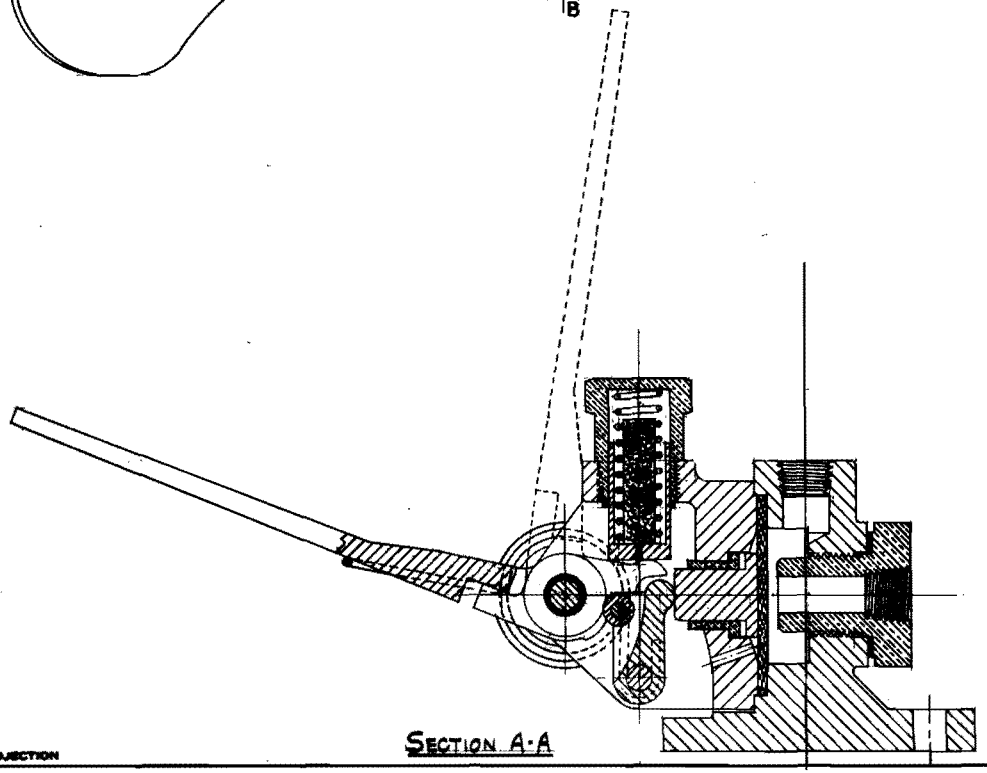
The type "C" diaphragm foot valve will initiate an emergency application should the operator remove his foot from the foot valve. As long as the operator keeps the foot valve depressed, the diaphragm will prevent air pressure from exhausting to atmosphere.

C-A





SECTION B-B



SECTION A-A

THIRD ANGLE PROJECTION

REVISIONS

SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASSY. NO.
			RA 558607	
SURFACE FINISH (MIL. IN. MAX.) SEE DWG. LS-511			TOLERANCES NOT SPECIFIED ON DWG. SEE DWG. LS-512	

C-5 DIAPHRAGM FOOT VALVE ASSEMBLY

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA. U.S.A.

DWG. A64637-4

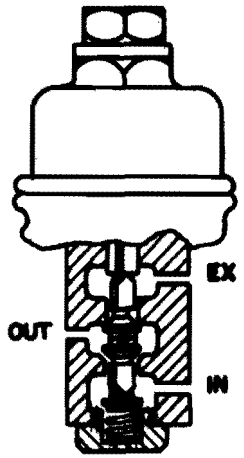
SIZE C

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
FJK		WPS			

FA-2 MAGNET VALVE

The FA-2 magnet valve is an electrically actuated, pneumatic valve. When in a de-energized position, supply air is directed to the delivery passage, and the exhaust passage is closed; when energized, delivery air is directed to exhaust, and the supply passage is closed.

A-A69565-103



SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASS'Y. NO.
SURFACE FINISH (MU. IN. MAX.) SEE DWG. LS-511			TOLERANCES NOT SPECIFIED ON DWG. SEE DWG. LS-512	

THIRD ANGLE PROJECTION

REVISIONS

FA-2 MAGNET VALVE DIAGRAMMATIC

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U. S. A.

DWG. SIZE	A 69565-103		
	DRAWN DATE	CHECKED DATE	APPROVED DATE
A	F.J.J.		FGE HCM

2947

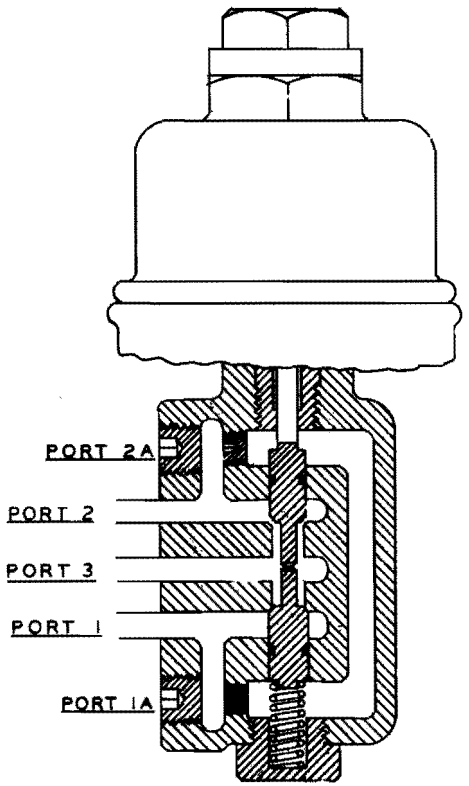
J-2 MAGNET VALVE

The J-2 magnet valve is an electrically actuated, pneumatic valve, also having the feature of direct or inverted operation, as described below:

Direct operation, and in the de-energized position: supply air is directed to the delivery passage, and the exhaust passage is closed; when in energized position, delivery air is directed to exhaust and the supply passage is closed.

Inverted operation, and in the de-energized position: delivery air is directed to exhaust, and the supply passage is closed; when in energized position, supply air is directed to delivery, and the exhaust passage is closed.

OPERATION	SUPPLY	EXHAUST	LOCATION OF PIPE PLUG
DIRECT	PORT 1	PORT 2	BEHIND PORT 2A
INVERTED	PORT 2	PORT 1	BEHIND PORT 1A



THIRD ANGLE PROJECTION

REVISIONS

J-2 MAGNET VALVE - DIRECT OPERATION — DIAGRAMMATIC

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA. U.S.A.

SIZE C | DWG. A 72750-10

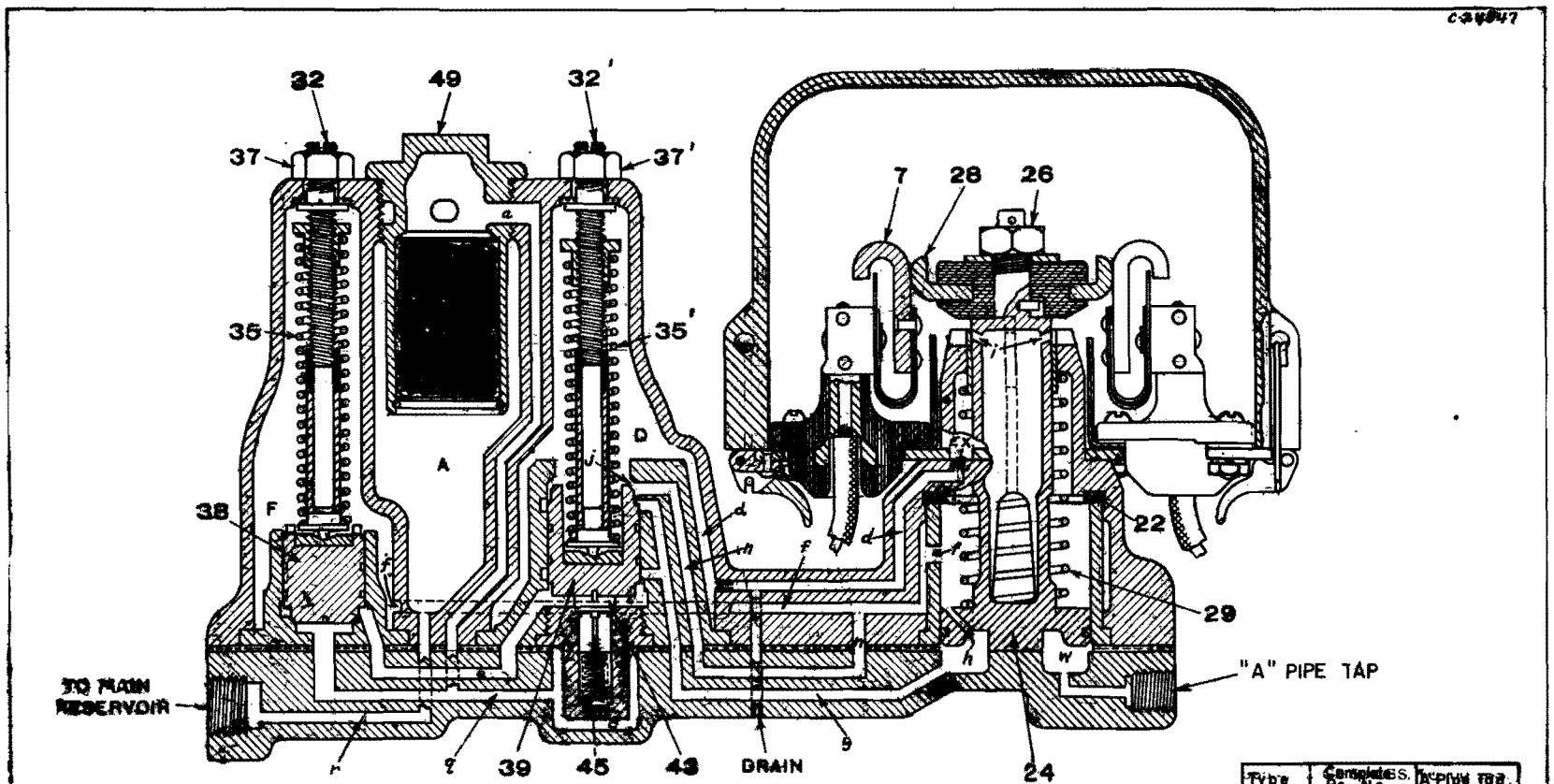
DRAWN NVB | CHECKED | APPROVED GLM

S-16-C ELECTRIC COMPRESSOR GOVERNOR

The S-16-C electric compressor governor is designed to automatically control the operation of the motor driven compressor between predetermined maximum and minimum air pressures. The governor automatically makes and breaks electric contacts to the compressor motor as the air pressure falls below or rises above the limits to which the governor is set.

Cut-out Operation. When main reservoir pressure has built up sufficiently to overcome the cut-out valve spring tension, the electrical switch contact will be broken and the compressor motor will stop. Pneumatic blowout is provided when breaking the electrical circuit.

Cut-in Operation. When main reservoir pressure has reduced below the predetermined cut-in setting, the cut-in valve will close the electrical contact switch to start the compressor motor.



Type	Complete Eq. No.	Applied to
S-16	A501413	
S-16-C	A533631	1/4" N.P.T.

WESTINGHOUSE AIR BRAKE CO
S16 ELECTRIC COMPRESSOR GOVERNOR
DIAGRAMMATIC

E 41083

OPERATION OF 26-R BRAKE EQUIPMENT (DWG. C-A81986-1)

The 26-B-1 brake valve of the 26-R brake equipment is arranged with a removable handle and with a cut-off valve that can be turned to either Cut-out Position or Passenger Position. On the operating brake valve, the handle should be in place, and the cut-off valve should be turned to Passenger Position. On all other brake valves in the train, the cut-off valve should be turned to Cut-out Position, and the brake valve handle should be removed.

When changing ends, the brake valve handle should be removed from the now inoperative brake valve, and the cut-off valve on that brake valve should be turned to Cut-out Position. To remove the handle, the brake valve handle must be moved to Emergency Position, the brake valve handle raised until a stop is reached, the handle turned to Handle-off Position, and the handle removed from that position. The cut-off valve can be turned after a special instrument has been inserted in the center of the cut-off valve knob. At the operative brake valve, the handle should be inserted until a stop is reached, the handle turned to Emergency Position, and lowered until the handle is in full engagement in the Emergency Position. The cut-off valve on the operative brake valve can be turned to Passenger Position by inserting the special instrument in the center of the cut-off valve knob. Removal of the handle from inoperative brake valves and the special lock in the cut-off valve are required to prevent unauthorized persons from tampering with inoperative brake valves. Movement of the cut-off valve from Passenger to Cut-off Position automatically positions the 26-B-1 brake valve to cut out safety control at that brake valve, as well as cutting off communication between the brake pipe and the operating portion of the brake valve.

To charge the equipment, the foot valve pedal should be depressed or the controller handle held down, and the brake valve handle should be moved to Release Position. The equalizing reservoir and the brake pipe will then be charged to the pressure set on the operative brake valve. To adjust brake pipe pressure, adjustment "A" at the back of the control air valve should be changed until the equalizing reservoir gage reads the desired pressure. Brake pipe pressure will automatically adjust to that pressure.

To initiate a service brake application, the brake valve handle is moved in the zone between Release and Service Positions. Since the 26-B-1 brake valve is an automatic, self-lapping brake valve, brake pipe pressure will be reduced directly in proportion to the amount of handle movement toward Service Position. A reduction of

brake pipe pressure at a service rate will be recognized at the 26-C control valve where air from the auxiliary reservoir will be permitted to flow to the service application pipe and to the controlling face of the relay portion of the variable load valve. The relay valve will automatically admit the desired amount of main reservoir air to flow to the brake cylinders.

To initiate an emergency application with the brake valve handle, the brake valve handle should be moved to Emergency Position, causing a cam on the brake valve handle shaft to unseat the vent valve in the brake valve, exhausting brake pipe air at an emergency rate. The emergency rate of brake pipe reduction is recognized at the 26-C control valve where air from the auxiliary reservoir is permitted to flow to the variable load valve as described for a service application. During an emergency application, auxiliary reservoir air is also free to flow through the high pressure valve to the emergency application pipe, through the variable load portion of the variable load valve and to the controlling face of the relay portion of the variable load valve. The relay valve will then operate to permit main reservoir air to flow to the brake cylinders in accordance with the pressure in the emergency application pipe, as regulated by the variable load valve portion of the variable load valve.

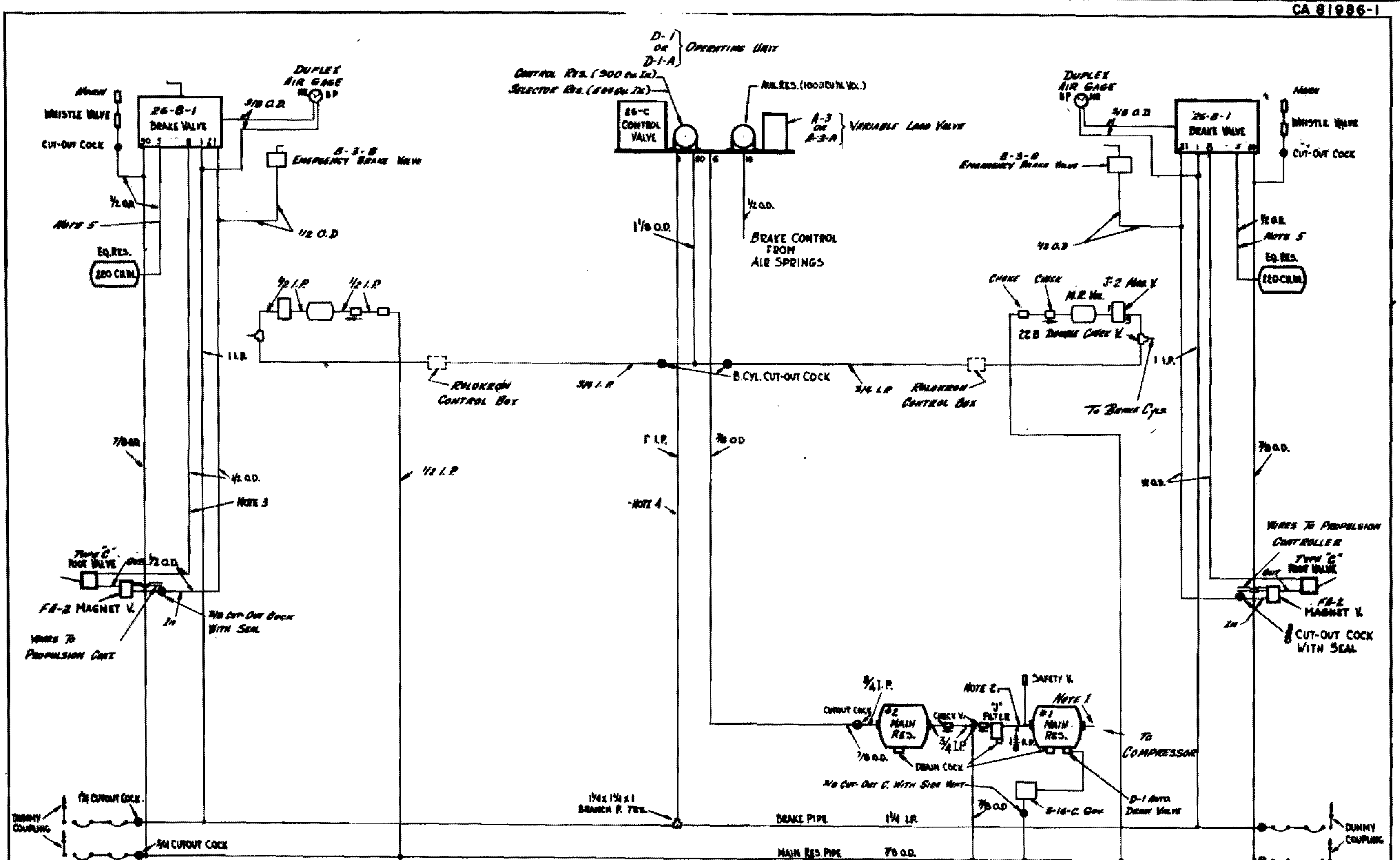
A safety control application can be prevented by keeping the foot valve depressed or by keeping the controller handle depressed, which in turn keeps the FA-2 magnet valve in its energized position. If the controller handle is released at the same time the operator's foot is taken from the foot valve, safety control pipe air (port 21) will be free to flow to atmosphere at the suppression valve in the brake valve. This will unbalance the vent valve, causing it to open and create an immediate emergency application. When the vent valve opens, a connection in the spool valve, connected to the vent valve, will permit main reservoir air to close the brake pipe cut-off valve and prevent escape of main reservoir air from the relay valve of the brake valve to atmosphere.

With the vent valve in Application Position, a connection is made in the brake valve connecting brake pipe safety control pipe to the lockover port (port 8) to atmosphere at the suppression valve. To reset the brake valve for continued operation, the brake valve must be moved to Suppression, Handle-off, or Emergency Position, forcing the suppression valve to move to close the opening for the lockover pipe to atmosphere. Brake pipe safety control pipe pressure will then build up in the vent valve to move the vent valve to its closed position, at the same time venting emergency reservoir air from the spring side of the brake pipe cut-off valve. With the con-

troller handle depressed or the foot replaced on the foot valve, the brake valve handle can then be moved to Release Position for continued operation.

A conductor's valve emergency application is provided by a B-3-B emergency brake valve in a branch from the brake pipe safety control pipe. Since brake pipe pressure is always present on the face of the vent valve, regardless of the position of the cut-off valve, venting the brake pipe safety control pipe will always create an emergency application. After a conductor's valve emergency at the operative brake valve, it will be necessary to move the brake valve handle to Suppression, Handle-off, or Emergency Position to reset that brake valve, but at the inoperative brake valves the brake valve will be in Handle-off Position, making it necessary only to reset the B-3-B emergency brake valve for continued operation.

For single car operation in certain areas, a separate emergency scheme is included in the 26-R brake equipment in case all other action fails to provide the desired brake application. A switch, connected electrically to a J-2 magnet at each truck, can be closed by the operator, energizing the J-2 magnet valve and permitting air from protected main reservoirs to flow past a double check valve in the brake cylinder piping directly to the brake cylinders. A choke in the line from the large main reservoirs prevents the build-up of brake cylinder pressure to full main reservoir pressure before the train has been stopped.



Notes:

1. 35 To 40 Feet Of Radiating Pipe Of Which 5 Feet Or More Adjacent To Main Reservoir To Be 1 1/8 O.D. And The Remainder To Be The Size Of Discharge At The Compressor. Substitutes For Radiating Pipe Should Be Equivalent To The Above Lengths Specified.
2. Reservoir Connecting Pipe To Be 35 Feet To 40 Feet Long Between The #1 Main Reservoir And The Filter, For Radiating Purposes. And This Pipe To Drain Toward The #1 Main Reservoir.
3. Length Of Pipe From Type C Foot Valve To Brake Valve Not To Exceed 4 Feet.
4. Length Of Brake Pipe Branch Pipe Not To Exceed 3 Feet.
5. Length Of Pipe From Brake Valve To Equalizing Reservoir Not To Exceed 6 Feet.

SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASSY. NO.
SURFACE FINISH (MU. IN. MAX.)		TOLERANCES NOT SPECIFIED ON DWG.		

26R BRAKE EQUIPMENT FOR DOUBLE END MU CAR PIPING DIAGRAM

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U.S.A.

DWG. SIZE C — A81986-1

DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
C.R.R.				E.A.E. CLW	

3078A

REVISIONS

MAINTENANCE OF 26-R BRAKE EQUIPMENT

It is essential that all brake parts be given attention at each cleaning period to insure proper serviceability.

The 26 passenger brake equipment consists of various operating portions, some of which are attached to their respective pipe brackets. Pipe connections are permanently made to these pipe brackets, and operating portions may easily be removed and replaced if necessary.

The purpose of these instructions is to avoid unnecessary expense due to careless handling of parts, since it is possible to assemble and disassemble individual portions. If excessive force is required, an investigation should be made immediately as to the cause of the difficulty.

Completely disassemble all portions and wash all parts (except diaphragms, rubber seated check valves, sealed bearings, rubber seals, "O" rings and gaskets) in mineral spirits; then blow clean with air.

BUSHINGS

All bushings, after they have been cleaned, must be examined for grooving, shoulders, cracks, pitting, and checked for taper and out-of-round.

STRAINERS AND FILTERS

Strainers and filters (except those designated to be cleaned in the A-1 strainer cleaning device) must be thoroughly washed in a suitable solvent and blown dry with a jet of clean dry air. Filters attached to choke plugs must be replaced.

CHOKES

The size of chokes is important, and whenever a portion is disassembled, the chokes must be cleaned and inspected to insure that they are not restricted. Metallic tools must not be used for cleaning chokes, as their size must not be changed. While chokes are removed, the passages must be checked for restrictions and blown out if necessary. The chokes can be cleaned in a suitable solvent and dried with a jet of air. The threads of all choke plugs and other removable plugs, as well as all other threaded parts, which may later be difficult to remove, must be coated lightly with a compound consisting of one part graphite (current AAR Specification M-913) and two parts oil (SAE-20) by weight.

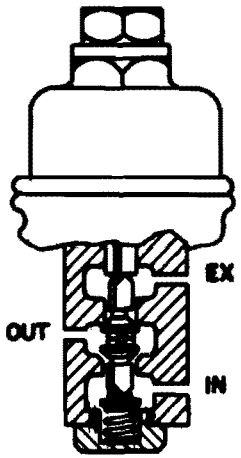
SPRINGS

All springs must be inspected after cleaning. Any that show rust pits, distortion, or have permanent set, must be replaced with ones known to be correct.

GASKETS, DIAPHRAGMS, RUBBER SEALS, "O" RINGS, AND RUBBER SEATED CHECK VALVES

All gaskets, diaphragms, rubber seals, "O" rings, and rubber seated check valves may be dipped in a suitable solvent to assist in the removal of dirt and grease, but these parts must be promptly wiped dry after cleaning and must not be allowed to soak in the cleaning fluid. Gaskets which have broken or flattened beads, cracks or cuts on diaphragms, must be replaced. Serviceable gaskets and diaphragms must be brushed with a soft bristle brush to remove any remaining dirt and to polish them. "O" rings should be replaced at each cleaning period, and when replacing "O" rings, apply a light film of Silicone Grease, MIL-L-4343, sparingly, to both the "O" ring as well as the groove. Care must be exercised when re-assembling so that no parts are damaged. It is important that cap screws and nuts are tightened sufficiently to prevent gasket leakage and yet not excessively to cause distortion of covers and gaskets.

A-A69565-103



SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASS'Y. NO.
SURFACE FINISH (MU. IN. MAX.) SEE DWG. LS-511			TOLERANCES NOT SPECIFIED ON DWG. SEE DWG. LS-512	

THIRD ANGLE PROJECTION

REVISIONS

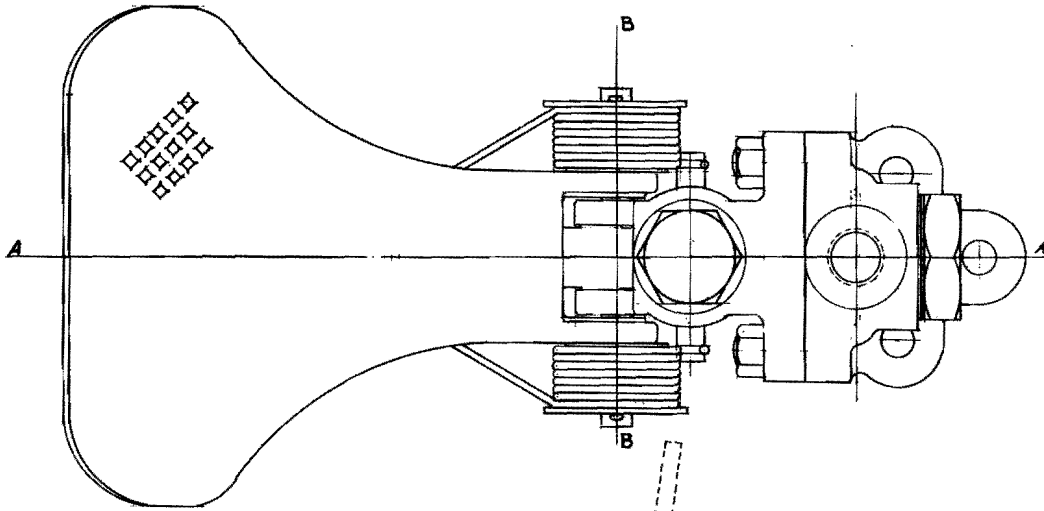
FA-2 MAGNET VALVE DIAGRAMMATIC

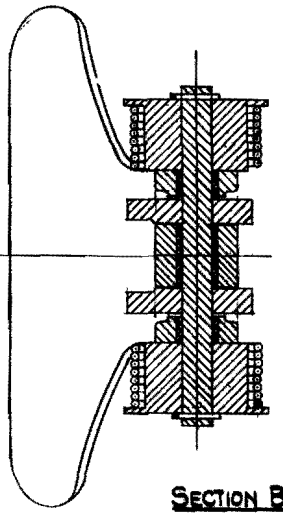
WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U. S. A.

DWG. SIZE	A 69565-103		
	DRAWN DATE	CHECKED DATE	APPROVED DATE
A	F.J.J.		EGE HCM

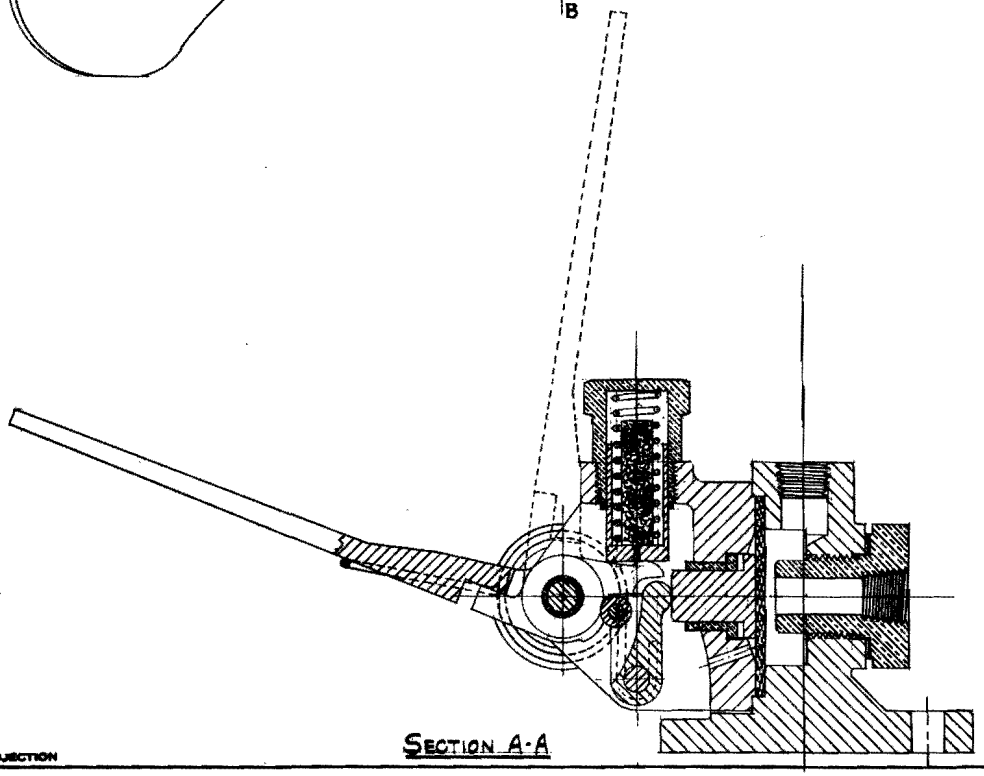
2947

C-A





SECTION B-B



SECTION A-A

THIRD ANGLE PROJECTION

SCALE	MATERIAL	MADE FROM	PIECE NO.	NEXT ASSY. NO.
			PA 558587	
SURFACE FINISH (MIL. IN. MAX.) SEE DWG. LS-511			TOLERANCES NOT SPECIFIED ON DWGS. SEE DWG. LS-512	

C-3 DIAPHRAGM FOOT VALVE ASSEMBLY

WESTINGHOUSE AIR BRAKE CO.
AIR BRAKE DIVISION
WILMERDING, PA., U.S.A.

DWG. C A64637-4

SIZE | DRAWN FJK | DATE | CHECKED WJS | DATE | ACCEPTED | DATE

REVISIONS

LETTER