



# Installation Instructions

Kit Pc.  
No. 5002299

BCM-KW MODULE: MODULE TUBE AND FITTING REPLACEMENT KIT

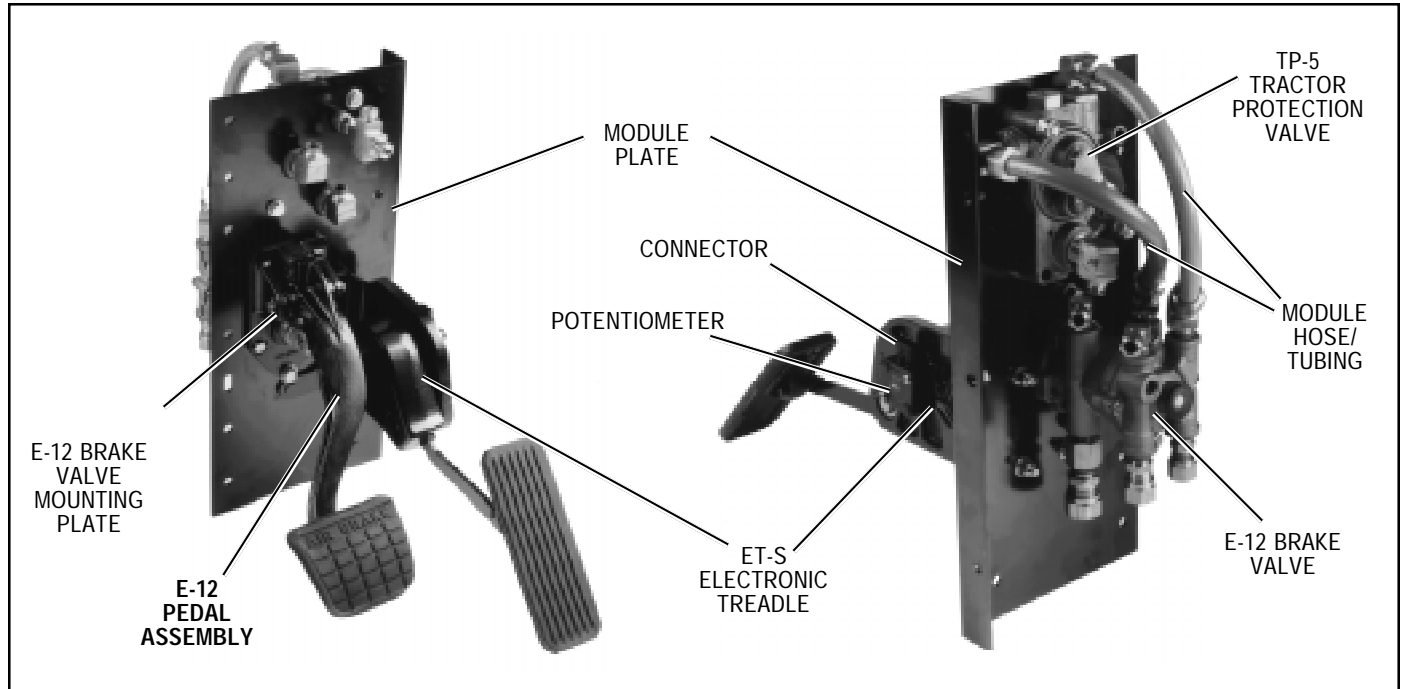


FIGURE 1 - BCM-KW MODULE

**IMPORTANT! PLEASE READ AND FOLLOW THESE INSTRUCTIONS TO AVOID PERSONAL INJURY OR DEATH:**

When working on or around a vehicle, the following general precautions should be observed **at all times**:

1. Park the vehicle on a level surface, apply the parking brakes, and always block the wheels.
2. Stop the engine when working around the vehicle.
3. If the vehicle is equipped with air brakes, make certain to drain the air pressure from all reservoirs before beginning ANY work on the vehicle.
4. Following the vehicle manufacturer's recommended procedures, deactivate the electrical system in a manner that removes all electrical power from the vehicle.
5. When working in the engine compartment the engine should be shut off. Where circumstances require that the engine be in operation, **EXTREME CAUTION** should be used to prevent personal injury resulting from contact with moving, rotating, leaking, heated, or electrically charged components.
6. Never connect or disconnect a hose or line containing pressure; it may whip. Never remove a component or plug unless you are certain all system pressure has been depleted.
7. Never exceed recommended pressures and always wear safety glasses.
8. Do not attempt to install, remove, disassemble or assemble a component until you have read and thoroughly understand the recommended procedures. Use only the proper tools and observe all precautions pertaining to use of those tools.
9. Use only genuine Bendix replacement parts, components, and kits. Replacement hardware, tubing, hose, fittings, etc. should be of equivalent size, type, and strength as original equipment and be designed specifically for such applications and systems.
10. Components with stripped threads or damaged parts should be replaced rather than repaired. Repairs requiring machining or welding should not be attempted unless specifically approved and stated by the vehicle or component manufacturer.
11. Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.

## DISASSEMBLY

These instructions explain the steps needed to replace all the fittings on the BCM-KW. Some minor repairs may be effected without the need to disassemble the BCM-KW, however, it is recommended that the technician read all of these instructions before beginning any repair.

If repairs do not require the BCM-KW Module to be removed from vehicle, proceed to item 3 of *TP-5 Removal* or *E-12 Removal* below depending upon the work required.

## BCM-KW REMOVAL

1. Park the vehicle on a level surface and block the wheels.
2. Drain the air pressure from all vehicle reservoirs - note that air lines may still hold residual pressure. Mark all air lines to aid reassembly, then disconnect all except the tubes/hoses between the TP-5 and E-12.
3. Unplug the cable assembly from the potentiometer on ET-S. Disconnect by lifting the lock tab and pulling the connectors until they disengage.
4. Remove and retain for reassembly the mounting hardware which attaches the BCM-KW to the vehicle.
5. Remove BCM-KW from vehicle.
6. Securely clamp the BCM-KW, by clamping the Module Plate only. Make sure that the plate is not distorted. Proceed to *TP-5* or *E-12 Removal*, step 3.

## TP-5 REMOVAL

1. Park the vehicle on a level surface and block the wheels.
2. Drain the air pressure from all vehicle reservoirs - note that air lines may still hold residual pressure.
3. Mark all air lines and tubes/hoses to the TP-5 to aid reassembly, then disconnect.
4. Remove the pipe fittings from driver's cab side of the TP-5.
5. The TP-5 mounting hardware is now removed.

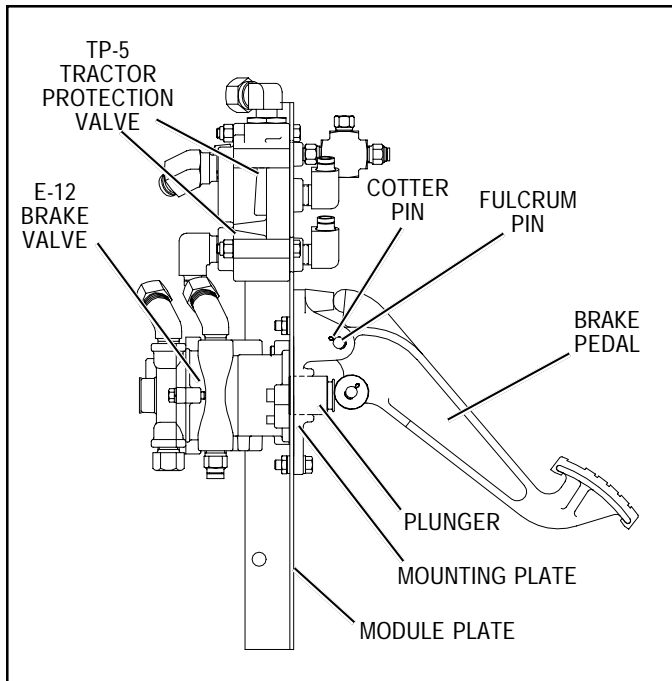


FIGURE 2 - BCM-KW MODULE: BRAKE PEDAL REMOVAL

## E-12 REMOVAL

1. Park the vehicle on a level surface and block the wheels.
2. Drain the air pressure from all vehicle reservoirs - note that air lines may still hold residual pressure. Mark all air lines to aid reassembly, then disconnect all except the tubes/hoses between the TP-5 and E-12.
3. Mark tubing/hoses where they attach to the E-12 to assist in reassembly and disconnect.
4. Remove the cotter pin holding the E-12 Brake Pedal Pin. Set aside this pin and the Brake Pedal Casting. Remove the Brake Pedal Plunger.
5. Remove E-12 valve and gasket by undoing the three cap screws which pass through the Module Plate and Mounting Plate.

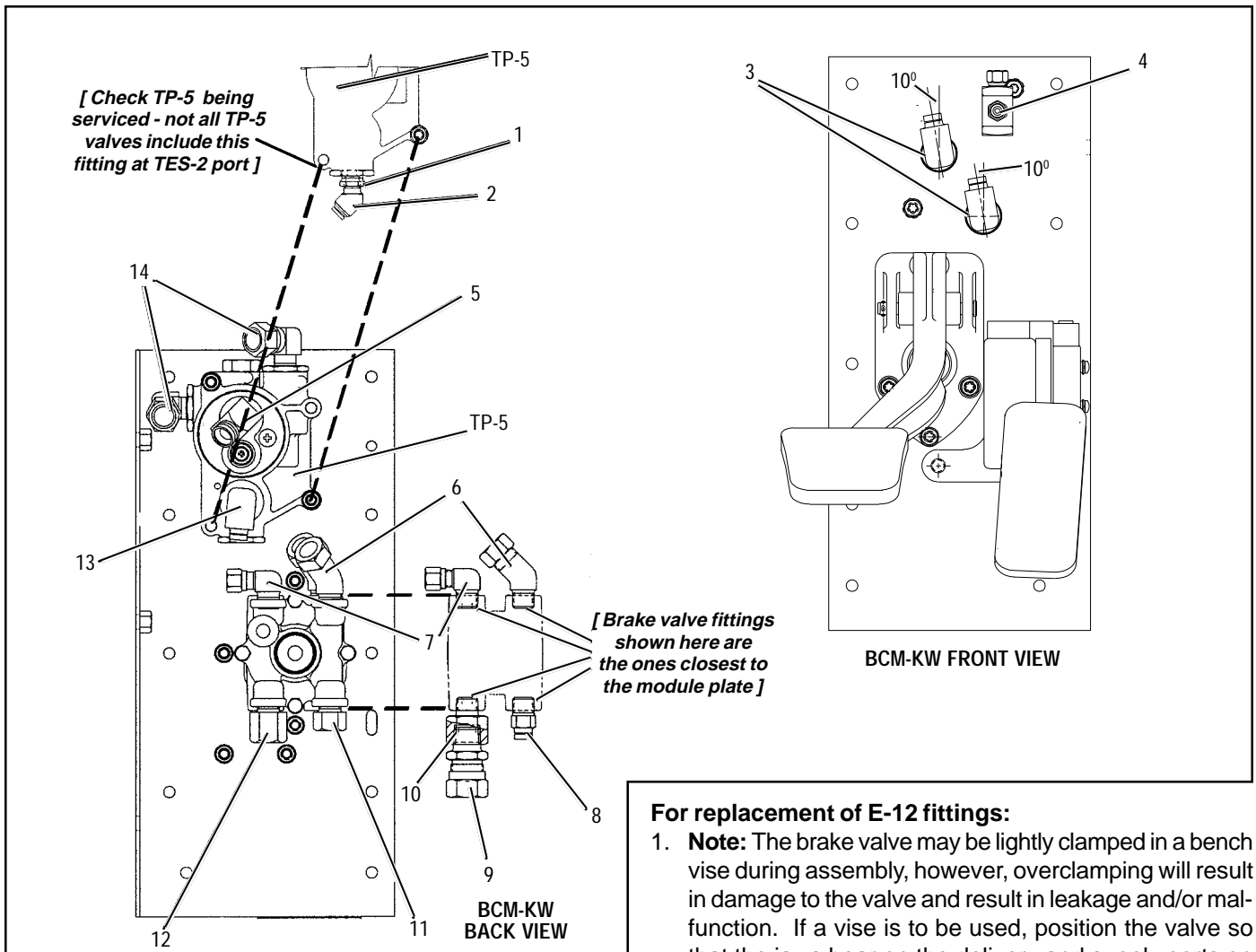
## CLEANING AND INSPECTION

1. Use suitable solvent (e.g. alkaline detergent and water) to clean all metal parts (note that mineral spirits may damage paint finish).
2. Inspect components for corrosion, pitting, or cracks. Replace as necessary.

## ASSEMBLY

### For replacement of TP-5 fittings:

1. Mark the orientation of any fittings being replaced.  
**Caution:** The TP-5 valve may be lightly clamped in a bench vise during this process, however, overclamping will result in damage to the valve and result in leakage and/or malfunction.  
Use Teflon Thread Sealant where needed, taking care not to allow any sealant to enter the valve. Torque to the minimum of the range for the specific fitting:  
1/8"-27 NPT: 55 - 85 lb. in.,  
1/4"-18 NPT: 130 - 170 lb. in.,  
1/2"-14 NPT: 180 - 240 lb. in. and then continue rotating clockwise to the correct position. (See Figures 4, and 5.)
2. Using the mounting hardware secure the TP-5 into position. Torque to between 75 and 110 lb. in.
3. Install fittings onto the driver's side of the BCM-KW Mounting plate. Use Teflon Thread Sealant where needed, taking care not to allow any sealant to enter the valve. Torque the two PTC fittings to 130 lb. in., the crossfitting to 55 lb. in., and then continue rotating clockwise to the positions shown in Figure 4.
4. The hoses/tubes are then reattached using the markings made at disassembly as a guide.
5. Perform *Operating and Leakage Tests* before returning vehicle into service.



**KIT CONTENTS**

KEY	ITEM	QTY
1	Reducer Bushing	1
2	1/4"-18 NPT 45° Male Elbow	1
3	3/8" - 18 NPT 90° PTC Male Elbow	2
4	Crossfitting Assembly	1
5	1/2" - 14 NPT PTC 45° Male Elbow	1
6	3/8"-18 NPT 45° Male Elbow	2
7	3/8" - 18 NPT 90° Male Elbow	2
8	3/8" PTC Male Connector	1
9	1/2" - 14 NPT Male Connector	1
10	3/8" - 18 NPT Adapter	1
11	1/2" - 14 NPT Male Connector	1
12	1/2" - 14 NPT Male Connector	1
13	3/8" - 18 NPT PTC 90° Male Elbow	1
14	3/8" - 18 NPT Male Connector	1
Not shown	5/8"x10-5/8" Nylon Tube (Orange)	1
Not shown	5/8"x10-5/8" Nylon Tube (Green)	1
Not shown	Barium Grease	1

**For replacement of E-12 fittings:**

- Note:** The brake valve may be lightly clamped in a bench vise during assembly, however, overclamping will result in damage to the valve and result in leakage and/or malfunction. If a vise is to be used, position the valve so that the jaws bear on the delivery and supply ports on opposing sides of the valve's upper body. Using Figures 3 and 5 as a guide, and marking the orientation of the fittings removed, replace the fittings as required. Use Teflon thread sealant on the fittings where needed, being careful not to permit any sealant into the valve.

**Note:** If it is necessary to replace the two-part fitting which is installed into lower SUP-1 11 port, note that these fittings need to be joined together before installation into the E-12. This is because the required torque for the outer fitting is higher than for the inner fitting. Overtorquing and damage to the port's threads would result from improper installation of these components. In each case, bring torque up to the minimum for the specific fitting:  
 1/4"-18 NPT: (torque range 130 - 170 lb. in.),  
 3/8"-18 NPT: (torque range 130 - 170 lb. in.),  
 1/2"-14 NPT: (torque range 180 - 240 lb. in.),  
 and then continue rotating clockwise to the correct orientation for each part.
- Insert the three mounting bolts through the Mounting Plate, the Module Plate, and the Metal Gasket. Gradually tighten the bolts in steps to a final range of between 75 and 110 lb. in. This process prevents any distortion of the brake valve which might affect its performance.

FIGURE 4 - BCM-KW MODULE: KIT CONTENTS LOCATIONS

3. Coat the plunger shaft with barium base grease and then it and the E-12 pedal can now be placed into position. Coat the pivot shaft with barium base grease and insert, fixing it into position using a 3/32" cotter pin. Note: Each leg of the Cotter Pin must be bent at least 45° (90° minimum included angle).
4. The hoses/tubes are then reattached using the marks made at disassembly as a guide.
5. If the BCM-KW module was removed from the vehicle see *BCM-KW Installation*.
6. Perform *Operation and Leakage Tests* before returning vehicle to service.

#### INSTALLATION: BCM-KW

1. Install the assembled BCM-KW Module into the vehicle. [If the O.E.M. gasket between the Module and vehicle requires replacement use Kenworth R42-1021.] Tighten the bolts to between 75 and 110 lb. in., making sure to prevent any distortion of the Module Plate.
2. Reconnect the cable connector by plugging it into the potentiometer's integral connector and pushing until the lock tab snaps into place.
3. Reattach the air lines using marks made at disassembly as a guide.

#### OPERATING AND LEAKAGE TESTS

1. Charge air brake system to governor cut-out, block the wheels, and place tractor protection control valve in the emergency position.

#### FOR THE TP-5:

Check fittings and exhaust port for leakage by coating them with a soap solution. The permitted leakage at the exhaust port is a one inch bubble in five seconds. Remedy any other leakage detected before returning vehicle to service.

#### FOR THE E-12:

Check the delivery pressure of both DEL-1 and DEL-2 of the E-12 circuits using accurate test gauges.

**Note:** The treadle or pedal will not be in a "normal" released position until the air brake system is pressurized. The pedal or treadle will rise to its normal release position as the brake system is pressurized from 0 psi.

Check that modulation is possible: Depress the treadle to several positions through its range of travel. At each point check that the valve produces steady delivery pressure. Adjust the pedal position both up and down to be sure that the valve is producing modulated pressure, with smooth transitions.

After a full application is released, the reading on the test gauges should fall off to zero promptly. It should be noted that the No. 1 circuit delivery pressure will be about 4 psi greater than the No. 2 circuit delivery pressure with both supply reservoirs at the same pressure. This normal for this valve.

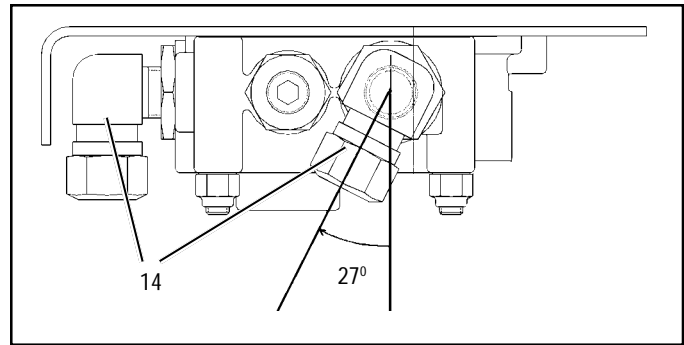


FIGURE 5 - TP-5 TUBE/HOSE FITTINGS (PLAN VIEW)

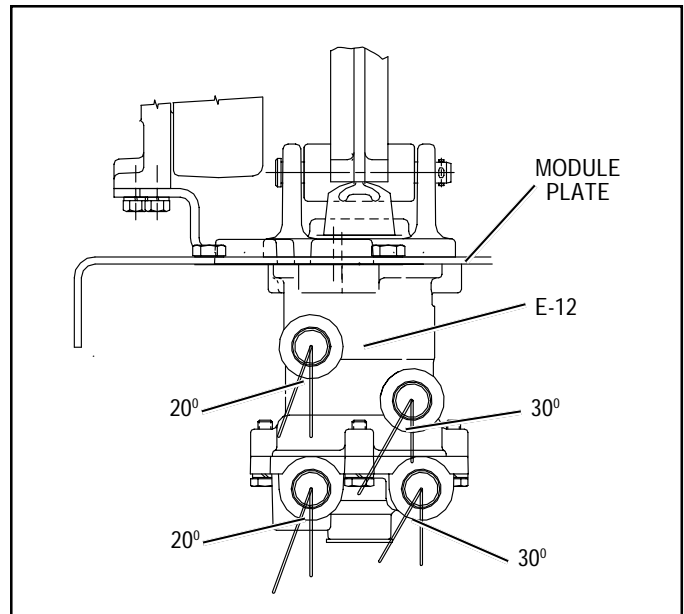


FIGURE 7 - BCM-KW TOP VIEW SHOWING ORIENTATIONS FOR E-12 FITTINGS

#### LEAKAGE TEST

Make and hold a range of pressure applications (e.g. 30, 50 and 80 psi) while testing the fittings, valve body and exhaust port for leakage by coating them with a soap solution. Permitted leakage at the exhaust port is a one inch bubble in 3 seconds in both the applied and released positions. No leakage is permitted anywhere else and must be remedied before returning vehicle to service.