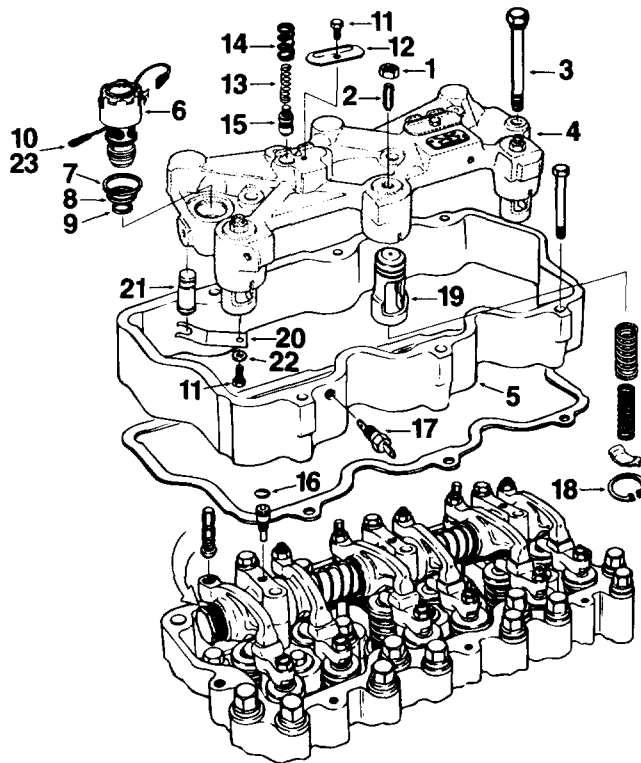


# Tune-up Kit for Model 680A

## P/N 018677



Illus. No.	P/N	Part Name	Quantity
7	001081	Upper Seal Ring	2
8	001082	Center Seal Ring	2
9	001083	Lower Seal Ring	2
10	014619	Solenoid Harness	2
11	001492	Hex Head Screw	10
12	012757	Control Valve Cover	4
13	003109	Inner Control Valve Spring	6
14	010843	Control Valve Stop Spring	6
15	011930	Control Valve	6
16	002411	"O" Ring	2
17	002299	Terminal Assembly, Leadout	2
18	001023	Retaining Ring	6
20	002030	Flat Spring	6
22	001030	Washer	6
23	017368	Harness	2

## Instructions

The parts in this kit are the most recent design by Jacobs for the Model 680A and are interchangeable with earlier production units.

Follow the procedures outlined below. For complete information, refer to the Jacobs Engine Brake Installation Manual, P/N 018061.



REMEMBER: ALWAYS USE THE PROPER TOOLS AND PROPER PROCEDURES, AND WEAR SAFETY GLASSES.

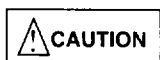
1. Thoroughly clean the cylinder head covers, engine brake spacers, and engine head area.
2. Remove cylinder head covers. Discard used cover gaskets.
3. Disconnect the electrical connections to the engine brake spacers.
4. Loosen the lock nuts (1) and back off the slave piston adjusting screws (2) until the slave pistons bottom in the engine brake housing.
5. Remove the housing hold-down bolts (3).
6. Lift off the engine brake housings (4) and place them on a clean work surface.
7. Lift off the engine brake spacers (5). Discard the used gaskets.
8. Now turn your attention to the engine brake housings.
9. Using a 7/8" 12-point socket, unscrew the solenoid valve assemblies (6) and remove them from the housings. Remove the two seal rings (7, 8) from the solenoid valve body. Be sure to remove the third seal ring (9) from the base of the bore. Use a hooked wire if required.
10. Wash out the solenoid valves with an OSHA-approved cleaning solvent. Use a brush to clean the oil screens. When clean, dry the valves with compressed air.

11. Clean out the solenoid valve bores in the housings. Use clean paper towels. Never use rags as they may leave lint and residue which can plug the oil passageways.
12. Install new seal rings in the base of the solenoid valve bores. Wipe clean lube oil into and around the bore. Install the upper and center seal rings onto the solenoid valve body. Now insert and screw down the solenoid valve assembly. Torque the valve to 60 lbin. (7 N•m). Be careful not to twist the seals while installing.
13. Install the new wires. If the spacer contains a blade connector, use solenoid harness (10); otherwise, use solenoid harness (23). Both are contained in the kit.



THE CONTROL VALVE COVERS HOLD SPRINGS UNDER PRESSURE, SO REMOVE THE COVERS CAREFULLY.

14. Slowly remove the screws (11) that hold down the control valve cover plates. Remove and discard the control valve springs (13, 14). Using needle-nose pliers, reach into the bore and carefully grasp the stem of the control valve (15). Pull the valve straight up and out of its bore.
15. Thoroughly clean the control valve bores in each housing using clean paper towels.
16. Drop the new control valves into clean lube oil. Holding the valve by the stem, let the valve drop into its bore.
17. Insert the new springs from the kit over the stem of the control valve. Install new covers and new cap screws from the kit.



WEAR SAFETY GLASSES AND USE CAUTION WHEN REMOVING THE SLAVE PISTON COMPONENTS. THE SPRINGS ARE UNDER HEAVY COMPRESSION AND CAN BE DISCHARGED AND CAUSE PERSONAL INJURY IF PROPER PROCEDURES AND TOOLS ARE NOT USED.

18. Remove the slave piston spring retaining ring (18) using Jacobs assembly fixture, P/N 012398, or an arbor press.
19. Compress the spring retainer enough to remove the load from the spring retainer, and using retaining ring pliers, remove the retaining ring.
20. Remove the load from the spring retainer by

slowly backing out the screw until the springs are relaxed. Remove the retainer, springs and slave piston (19).

21. Clean all parts and the slave piston bore in an OSHA-approved solvent. Inspect all parts for wear or damage and replace as needed.
22. Use a new retaining ring and replace all the components reversing the removal procedure.
23. Remove the screws (11), flat springs (20), washers (22) and master pistons (21) from the housings. Discard the springs, screws and washers.
24. Inspect the master piston for damage or excessive wear. Replace if necessary.

NOTE:

IF HARD FACING IS DAMAGED, INSPECT THE CORRESPONDING ROCKER ARM ADJUSTING SCREWS FOR EXCESSIVE WEAR OR PITTING. REPLACE IF DAMAGED.

25. Reinstall the master pistons and install new flat springs, screws and washers.

NOTE:

WHEN TIGHTENING THE SCREW, BE SURE THE MASTER PISTON RAISED PORTION IS CENTERED IN THE FORKED AREA OF THE SPRING.

26. Install new "O" rings (16) on the oil supply adapters. Wipe a small amount of grease on the adapters.
27. Carefully install the brake housing, paying particular attention to the oil supply adapter to insure proper alignment. Be sure that the front housing is placed over the front three cylinders, and the rear housing is placed over the rear three cylinders.
28. Install the housing hold-down bolts. Alternately tighten and torque to 55 lbft. (75 N•m).
29. Engine intake and exhaust valves can be readjusted at this time. Engine adjustments should be made by trained technicians in accordance with information given in the Mack Operation and Maintenance Manual for cold static clearance.
30. Adjust slave pistons.
31. You must make slave piston adjustments with the engine stopped and cold. The exhaust valve on the cylinder to be adjusted must be in the closed position. Loosen the locknut and back off the slave piston adjusting screw on the cylinder with the exhaust valve closed. Back out the adjusting screw until the slave piston bottoms on the engine brake housing.



YOU MUST STRICTLY ADHERE TO THE FOLLOWING ADJUSTMENT PROCEDURE. ANY OTHER METHOD OF ADJUSTING THE SLAVE PISTON CLEARANCE IS NOT AUTHORIZED BY JACOBS AND MAY RESULT IN SERIOUS ENGINE AND/OR ENGINE BRAKE DAMAGE.

32. Insert a 0.085 feeler gauge, P/N 014177, between the slave piston and the exhaust valve yoke. Turn the adjusting screw until you feel a light drag on the feeler gauge.
33. Tighten the locknut to 17 lbft. (23 N•m). Always recheck the adjustment after the locknut is torqued. Continue turning the engine in the direction of rotation and set slave piston clearance on the remaining cylinders in firing order.
34. Wipe the engine brake spacer clean. Install the new terminal leadout assembly (17) in the engine brake spacer.

NOTE:

IF YOU HAVE THE NEW STYLE SPACER ASSEMBLY WITH THE BULLET CONNECTOR, DO NOT REMOVE THE CONNECTOR. DISCARD THE P/N 002299 TERMINAL ASSEMBLY AND THE P/N 014619 HARNESS.

35. Wipe the head surface clean. Install the engine brake spacers using new gaskets.
36. Attach the solenoid harness to the solenoid terminal and to the inside terminal of the leadout assembly. Attach the lead wire to the outside terminal of the leadout assembly.
37. Replace the cylinder head covers using new gaskets. Reinstall any engine compartment parts.
38. To insure proper engine brake operation, check engine brake wiring and switch adjustments. Make corrections as required.

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## Jacobs Engine Brake Replacement Parts Limited Warranty

Jacobs engine brake replacement parts, products of the Jacobs Vehicle Equipment Company, are sold with the following warranty:

Jacobs engine brake replacement parts are warranted to be free of defects in construction and operation under normal use and service for the warranty coverage periods set forth below.

THERE ARE NO REPRESENTATIONS OR WARRANTIES WHICH EXTEND BEYOND THE TERMS HEREOF OR THE DESCRIPTION OF THE PRODUCT CONTAINED IN THE CONTRACT FOR SALE.

### Warranty Coverage:

Coverage is in accordance with the published Replacement Parts Warranty. Replacement parts installed during the original warranty coverage period for a Jacobs engine brake are warranted as stated in the Jacobs engine brake warranty.

Under this warranty, our factory is obligated to replace, without charge, any part returned to us which our examination discloses to our satisfaction to have been defective within the Warranty coverage

period measured from the date of delivery of the product in question to the original user.

Jacobs will also pay for all repairs to damaged engine components in which Jacobs replacement parts have been properly installed, provided the damage is shown to be a direct result of a defect of Jacobs replacement parts occurring under normal operation during the warranty coverage periods specified above.

This warranty will not apply to any part or parts which have been altered or repaired outside of our factory or authorized Jacobs distributor service centers, nor to parts which have been subjected to misuse, abuse, neglect or accident, nor to parts which have been improperly applied or installed. Improper installation or application, or substitution of parts not manufactured or approved by us, shall void this warranty.

JACOBS SOLE LIABILITY AND YOUR EXCLUSIVE REMEDY IS LIMITED TO THE OBLIGATIONS SET FORTH HEREIN, AND JACOBS SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES.

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