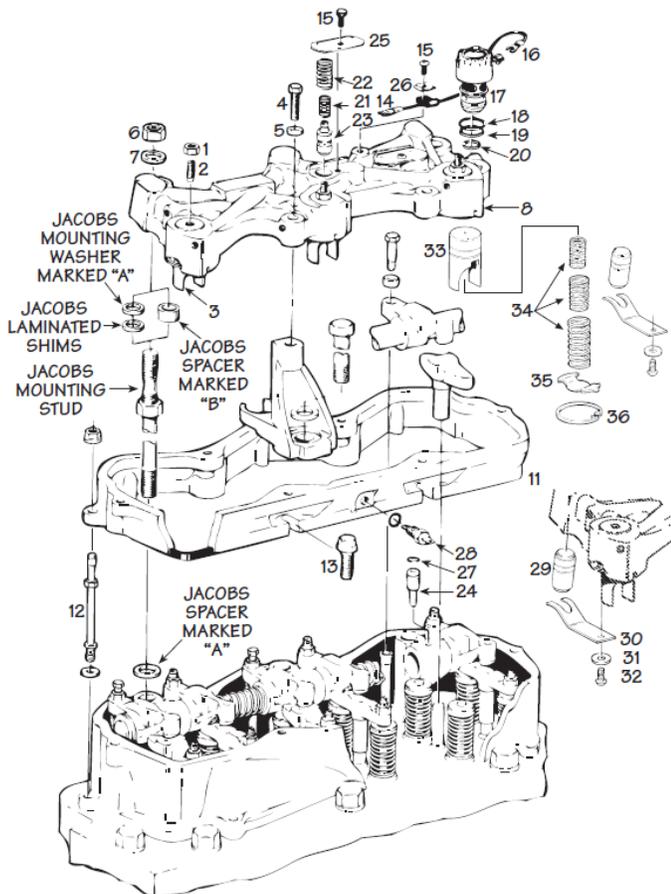




Model 346 Tune-Up Kit Instructions

Jacobs P/N 014087



Tune-up Kit Contents

III. No.	Jacobs	Part Name	Qty.
14	014908	Cable Clamp	2
15	001722	Hex Buttonhead Capscrew, C346, A, B	6
16	015843	Wire	2
18	020229	Upper Seal Ring, yellow stripe	2
19	001082	Center Seal Ring	2
20	001083	Lower Seal Ring	2
21	011435	Control Valve Spring	6
22	011434	Control Valve Stop Spring	6
23	039022	Control Valve	6
27	002411	"O" Ring	2
28	025663	Terminal Leadout with "O" Ring	2
30	013158	Flat Spring	6
31	001030	Plain Washer	6
32	003790	Hex Buttonhead Capscrew	10
NI	004490	Receptacle	2
NI	006837	Shim	8
NI	016497	Stud Washer	4
NI	017303	Drive Screw	2
NI	017366	Terminal Assembly (use on Spacer P/N 018026)	2
NI	018245	Wire Harness Clip	2
NI	018458	Wire (Bullet / Screw)	2
NI	017890	Instructions	1

NI = Not Illustrated

General Information

For additional information on the Model 346 engine brake, refer to Jacobs Engine Brake Installation Manuals, P/N 011498 or 017317.

Use OSHA-approved cleaning solvent for cleaning parts. Original parts to be reused should be inspected for wear and replaced as required. Wear safety glasses where indicated.

Safety Precautions

The following symbols in this manual signal conditions potentially dangerous to the mechanic or equipment. Read this manual carefully. Know when these conditions can exist. Then take necessary steps to protect personnel as well as equipment.

 **WARNING** THIS SYMBOL WARNS OF POSSIBLE PERSONAL INJURY.

 **CAUTION** THIS SYMBOL REFERS TO POSSIBLE EQUIPMENT DAMAGE.

NOTE: INDICATES AN OPERATION, PROCEDURE OR INSTRUCTION THAT IS IMPORTANT FOR CORRECT SERVICE.

Fuels, electrical equipment, exhaust gases and moving engine parts present potential hazards that could result in personal injury. Take care when installing equipment or parts. Always wear safety glasses. Always use correct tools and follow proper procedures as outlined in this manual.

Access Engine Brake

 **WARNING** NEVER REMOVE OR ADJUST ANY ENGINE BRAKE OR COMPONENT WITH THE ENGINE RUNNING.

Access Engine Brake

1. Thoroughly clean engine.
2. Remove accessory equipment to gain access to rocker lever covers and remove covers.
3. Disconnect electrical connections at the spacer.
4. Remove engine brake housing capscrew (4), nut (6), and washers (5, 7). Remove housings (8).
5. Remove seal rings (27) from oil supply adapter (24) and remove terminal leadout assemblies (28). Discard seal rings and lead out assemblies.

NOTE: LATER-STYLE SPACERS HAVE BULLET-TYPE CONNECTORS. DO NOT REMOVE THESE.

Disassemble Housings

1. Remove the solenoid harness (16) and valve (17); discard the harness and the three seal rings (18, 19, 20).



CONTROL VALVE COVERS (25) ARE UNDER TENSION FROM CONTROL VALVE SPRINGS (21, 22). REMOVE COVERS CAREFULLY AND WEAR SAFETY GLASSES.

2. Hold down control valve cover while removing the capscrew (15). Remove and discard springs, control valves (23), and capscrews. Save the control valve covers.
3. Remove the master piston (29); discard the flat spring (30), washer (31), and capscrew (32). Save the master piston.



SLAVE PISTONS (33) ARE RETAINED BY HEAVY SPRINGS (34). TO AVOID INJURY WHEN REMOVING THE SLAVE PISTON, USE PROPER TOOLS AND WEAR SAFETY GLASSES.

4. Remove locknut (1) from the slave piston adjusting screw (reset) (2) and back out the screw until the slave piston is fully retracted.
5. Install the slave piston tool, P/N 017397 with the adjusting screw fitted into the hole in the tool.
6. Compress the slave piston springs (34) and remove the retaining ring (36).
7. Remove the retainer (35), spring, slave piston and adjusting screw.

Assemble Housings

1. Clean Housings and all parts in approved cleaning solvent. Dry with compressed air.
2. Coat all parts to be installed into housings with clean lube oil.
3. Reinstall the original slave piston, reversing the removal procedure.

NOTE: BEFORE REMOVING THE SLAVE PISTON FIXTURE, ROTATE THE RETAINING RING 90° FROM THE SLOT IN THE HOUSING.

4. Remove the fixture and install the adjusting screw locknut.
5. Install the new control valves, springs and capscrews. Reinstall the original cover.
6. Install the original master pistons with new flat springs, washers and capscrews.

NOTE: WHEN TIGHTENING THE SCREWS, BE SURE THAT THE SPRING LEGS ARE CENTERED AROUND THE MASTER PISTON BOSS.

7. Install the lower (smallest) solenoid seal ring in the bottom of the solenoid valve bore and the upper and center seal rings on the solenoid valve. Insert the solenoid valve into the bore. Tighten to 110 lb.-in. (12 Nm).

Install Engine Brake Housings

NOTE: ENGINES WITH SERIAL NUMBERS LOWER THAN 7FB39279 AND ALL 92U PREFIX ENGINES, REQUIRE THE HOUSING LEVELING PROCEDURE. REFER TO THE LEVELING (SHIMMING) PROCEDURES CONTAINED IN THE C346C INSTALLATION MANUAL, P/N 017317.

Engine brake installations may have one or two housing support brackets (or bases) per housing (see Fig. 1). The use of different style housing supports for any engine is permissible.

1. Install the seal rings on the oil supply adapters.
2. Install the housings over the studs and on the supports.
3. Install the nuts, capscrews and washers as shown in Fig. 1.
4. Torque the 3/4" hold-down nuts to 60 lb.-ft. (82 Nm).

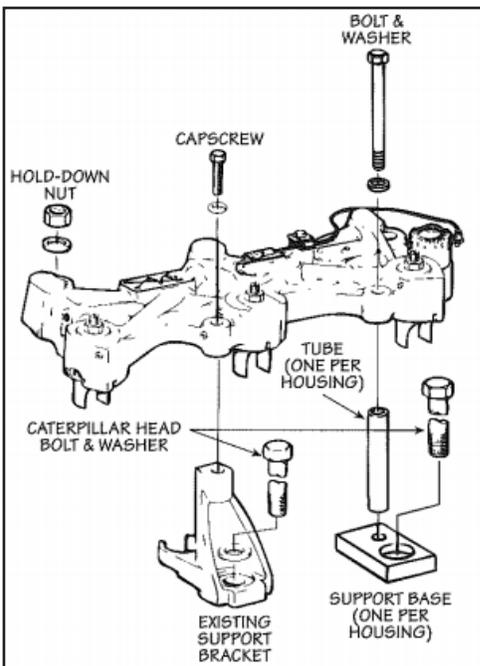


Fig. 1

5. Torque the capscrews in the supports to the torques shown in Fig. 1.
6. Retorque the 3/4" hold-down nuts to 100 lb.-ft. (135 Nm).
7. Slave piston adjustments must be made with the engine stopped and cold. Turn the engine until the exhaust valves on the cylinder to be adjusted are in the closed position. Be sure the slave piston adjusting screw is backed out before starting the slave piston adjustment (see chart on next page).

CAUTION

FOLLOW ADJUSTMENT PROCEDURES EXACTLY. 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.

8. Insert the proper feeler gage between the slave piston and the exhaust valve bridge. Turn the adjusting screw in until you feel a slight drag on the feeler gage.
9. Tighten the locknut to 16 lb.-ft. (22 Nm). Continue turning engine in the direction of rotation and set slave piston clearance on the remaining cylinders at valve set marks in firing order. Consult the Caterpillar Service Manual to locate the valve set marks. Three slave pistons can be adjusted at any one timing position.
10. Install the new terminal leadout assemblies (28) in the engine brake spacers. Inspect the spacer gasket and replace if necessary.
11. Install the spacer and torque the capscrews and nuts to 13 lb.-ft. (18 Nm).
12. Attach the solenoid lead wire to the inside terminal of the leadout assembly. Attach the lead wire to the outside terminal of the leadout assembly. Install the new cable clamp in the housing and attach the wire to the clamp.
13. Replace the rocker housing covers and any engine components.
14. To ensure proper engine brake operation. Check engine brake wiring and switch adjustments. Make corrections as needed.

Application and Adjustment Information

Jake Brake® Model	Engine Model/ Model Year	Engine Rating (Horsepower)	Slave Lash	Adjusting Tool P/N
346D	2EK - 4CK	All except 460 460	0.067" 0.090"	017920 018488
346D	5KJ 3406B Engine	All except 400 400	0.080" 0.067"	018781 017920
346D	5KJ 3406C Engine	310 - 350 365 - 460	0.080" 0.090"	018781 018488
346D	8PN, 3406C Engine	All	0.080"	018781
346D	3ZJ16181 and below, 3406B Engine	All except 400 400	0.080" 0.067"	018781 017920
346D	3ZJ16182 and greater, 3406C Engine	310 - 350 365 - 460	0.080" 0.090"	018781 018488
C346B	4MG , 5YG, 7FB, 8TC Pre-1991 Model Year 3406B Engine	With Update Kit Std. 3-point mount	0.080" 0.070"	018781 013184
C346C/D	4MG , 5YG, 7FB, 8TC Pre-1991 Model Year 3406B Engine	All	0.080"	018781
C346/A/D	92U, 3406 Engine	All	0.060"	007446