



**NUMBER:** SB-266-017  
**DATE:** 8/25/03  
**MODEL:** ASET™,  
 E-Tech™, E7

(Also applies to Mack Trucks Australia)

## ENGINE BRAKE SERVICE INFORMATION SUMMARY — E-TECH™ AND ASET™ WITH J-TECH™, AND E7 WITH JACOBS ENGINE BRAKES

This bulletin provides a summary of service information concerning Jacobs engine brakes on E7, E-Tech™ and ASET™ engines.

### NOTE

Jacobs Vehicle Systems Regional Managers are available to assist with product training, service training and troubleshooting engine brakes used on MACK engines. To request technical assistance from Jacobs, please contact Jacobs Vehicle Systems directly at 1-800-876-5253, or contact a MACK District or Regional Service Manager.

### Engine Brake Retrofit Kits

The following kits are used to install an engine brake on a non-brake engine.

Engine Model	Engine Brake Retrofit Kit Part No.	Engine Brake Part No.
E7	215SB207B	757GB54 (front)/757GB53 (rear)
E-Tech™	215SB327*	757GB59C
ASET™ AI, AMI	215SB327	757GB59C
ASET™ AC	215SB327	757GB59C

\* For E-Tech™ engines, kit part No. 215SB327 is recommended. Any remaining stock of kit part No. 215SB293A, B or C can be used as long as the brake supplied in kit is part No. 757GB59B or C. If not, update brake to 757GB59C using kit part No. 215SB321.

### J-Tech™ Engine Brake Service Kit Applications

Service Kit Part No.	Kit Description	Notes
4559-28190	Control Valve Update Kit	The control valves originally included in this kit are now obsolete. This kit has been terminated. Service bulletin SB-266-011 has been cancelled. For engine brake units needing the control valves replaced, individual parts are available through the MACK Parts System. Refer to page 6 and 7 for an exploded view of an engine brake unit, along with a list of part numbers.

Service Kit Part No.	Kit Description	Notes
4559-30950	J-Tech™ Conversion Kit	This kit is obsolete and has been terminated. The individual parts originally contained in this kit, however, are available through the MACK Parts System. Refer to page 6 and 7 for an exploded view of an engine brake unit, along with a list of part numbers. Service bulletin SB-266-015 outlines the primary solution to engine brake performance and “drop-out” issues. When addressing a performance/drop-out issue on a dual-fed engine brake unit, and diagnostic procedures indicate a faulty component, use the individual parts as required.
215SB320	J-Tech™ Reset Screw, Slave Piston Spring and Valve Yoke Adjusting Screw Update Kit	This kit has been terminated and superseded by kit part No. 215SB321.
215SB321	J-Tech™ Reset Screw, Slave Piston Spring and Actuating Pin Adjusting Screw Update Kit	Supersedes kit part No. 215SB320. Applies to Product Improvement Programs PI550 and PI552, and also service bulletin SB-266-015.
57GC522P2	External Oil Line Kit	Includes all components (excluding the two steel oil feed lines [part No. 8609-82000]) necessary for the installation of the engine brake external oil supply lines (refer to Additional Service Notes 1 and 2 on page 8). Service bulletin SB-266-015 outlines the procedures for converting an bottom-fed engine brake unit to a dual-feed.

### J-Tech™ Engine Brake Action Items

The following instructions apply when addressing an engine brake “drop-out” condition or complaints of poor performance:

Engine Brake Model	Having Housing Part No.	Perform the Following.	Refer to Service Bulletin
690	757GB58A, B or C	Convert housing to top oil feed and install J-Tech™ Service Kit part No. 215SB321.	SB-266-015

Engine Brake Model	Having Housing Part No.	Perform the Following.	Refer to Service Bulletin
690A	757GB59	For engine serial Nos. 0N0077 through 0R3258 (build date range July 3 through October 2, 2000), install external oil line kit part No. 57GC522P2 (refer to Additional Service Note 1 on page 6), and inspect the reset screw for the presence of 032053A stamped next to the screwdriver slot. If the screws are part No. 032053A, the brake has the 215SB321 kit parts. If the reset screws are any other part number, install kit part No. 215SB321, following all the instructions outlined in bulletin SB-213-027 (refer to Additional Service Notes 4 and 5 on page 8).	SB-213-027 SB-266-013
690B	757GB59A	<p>For engine serial Nos. 0R3259 through 0V0113 (build date range October 2 through November 14, 2000), replace existing top oil feed check valve fitting (part No. 691GC226) with current fitting (part No. 691GC226A) and inspect the reset screw for the presence of 032053A stamped next to the screwdriver slot. If the screws are part No. 032053A, the brake has the 215SB321 kit parts. If the reset screws are any other part number, install kit part No. 215SB321, following all the instructions outlined in bulletin SB-213-027 (refer to Additional Service Notes 4 and 5 on page 8).</p> <p>For engine serial Nos. 0V0114 through 2R2728 (build date range November 14, 2000 through September 25, 2002), inspect the reset screw for the presence of 032053A stamped next to the screwdriver slot. If the screws are part No. 032053A, the brake has the 215SB321 kit parts. If the reset screws are any other part number, install kit part No. 215SB321, following all the instructions outlined in bulletin SB-213-027 (refer to Additional Service Notes 3 and 5 on page 8).</p>	
690B	757GB59B	This engine brake unit contains all the latest upgrades. No further component upgrades are necessary. Perform normal diagnostic procedures when engine brake performance issues are encountered. (Refer to Additional Service Notes 1 on page 8.)	ESB-200-2002-288-01

Engine Brake Model	Having Housing Part No.	Perform the Following.	Refer to Service Bulletin
690B	757GB59C	This engine brake unit contains all the latest upgrades. No further component upgrades are necessary. Perform normal diagnostic procedures when engine brake performance issues are encountered. (Refer to Additional Service Notes 1 on page 8.)	ESB-200-2002-288-01

**Tune-Up Kits** (these kits are used for general engine brake tune-ups and overhauls, they are not to be used for warrantable repairs)

Engine Brake Model	Engine Brake Assembly Part No.	Applicable Kit Part No.
680B	757GB54 (front) and 757GB53 (rear)	4559-18678
690, 690A and 690B	757GB58(A)(B)(C), and 757GB59(A)(B)(C)	4559-31180

### Service Bulletins

The following is a list of service bulletins that apply to the J-Tech™ Engine Brake:

Service Bulletin No.	Bulletin Title
SB-213-027	Valve Yoke Guide Pin, Rotator and Slave Piston Spring Breakage — Engines Equipped With J-Tech™ Engine Brake
SB-213-030	Flange-Style Jam Nuts for Rocker Arm and Valve Yoke Adjusting Screws — E-Tech™ Engines
SB-213-032	Valve Lifter, Camshaft and other Valve Train Changes — E-Tech™ Engines
SB-266-012	J-Tech™ Model 690 Oil Supply Screw
SB-266-013	J-Tech™ Engine Brake With Top Oil Supply Port for External Oil Line
SB-266-015	Converting J-Tech™ 757GB58 Series Engine Brake Units to Top Oil Feed
ESB-200-2002-288-01	Tie-In for New Jake Brake Reset Screws and Slave Piston Springs

### Product Improvement Programs

The following Product Improvement Programs apply to J-Tech™ engine brakes on E-Tech™ engines:

Product Improvement Program	Affected Engines	Title
PI550	E-Tech™ engines manufactured January 1, 2002 through September 25, 2002 (engine serial Nos. 2A0001 through 2R2728)	J-Tech™ Engine Brake Component Improvements
PI552	All E-Tech™ engines manufactured October 1, 2000 through December 31, 2001 (engine serial Nos. 0R3259 through 1Y2113)	J-Tech™ Engine Brake Component Improvements

## Service Tools

- **4559-18280 — Oil Pressure Test Kit** — Includes an oil pressure test gauge used for diagnosing performance problems with all Jacobs engine brake models.
- **4559-25084 — Slave Piston Removal Tool** — Used to compress and safely remove the slave piston springs.
- **4559-22161 — MACK Engine Brake Tool Kit** — Contains thickness gauges and slave piston removal tool necessary for servicing Jacobs engine brakes on all MACK engines.
- **Thickness Gauges — Used for setting engine brake slave lash —**
  - **4559-22001** — 0.060" thickness gauge (for E7 engines)
  - **4559-20521** — 0.080" thickness gauge (for E7 engines)
  - **4559-14177** — 0.085" thickness gauge (for E7 engines)
  - **4559-21327** — 0.100" thickness gauge (for E7 engines)
  - **Standard Thickness Gauge** — 0.017" (for E-Tech™ engines with any reset screw other than part No. 032053A)
  - **Standard Thickness Gauge** — 0.021" (for E-Tech™ and ASET™ engines with reset screw 032053A)

Refer to the applicable engine service manual for the correct engine brake lash settings.

## Glossary of Terms

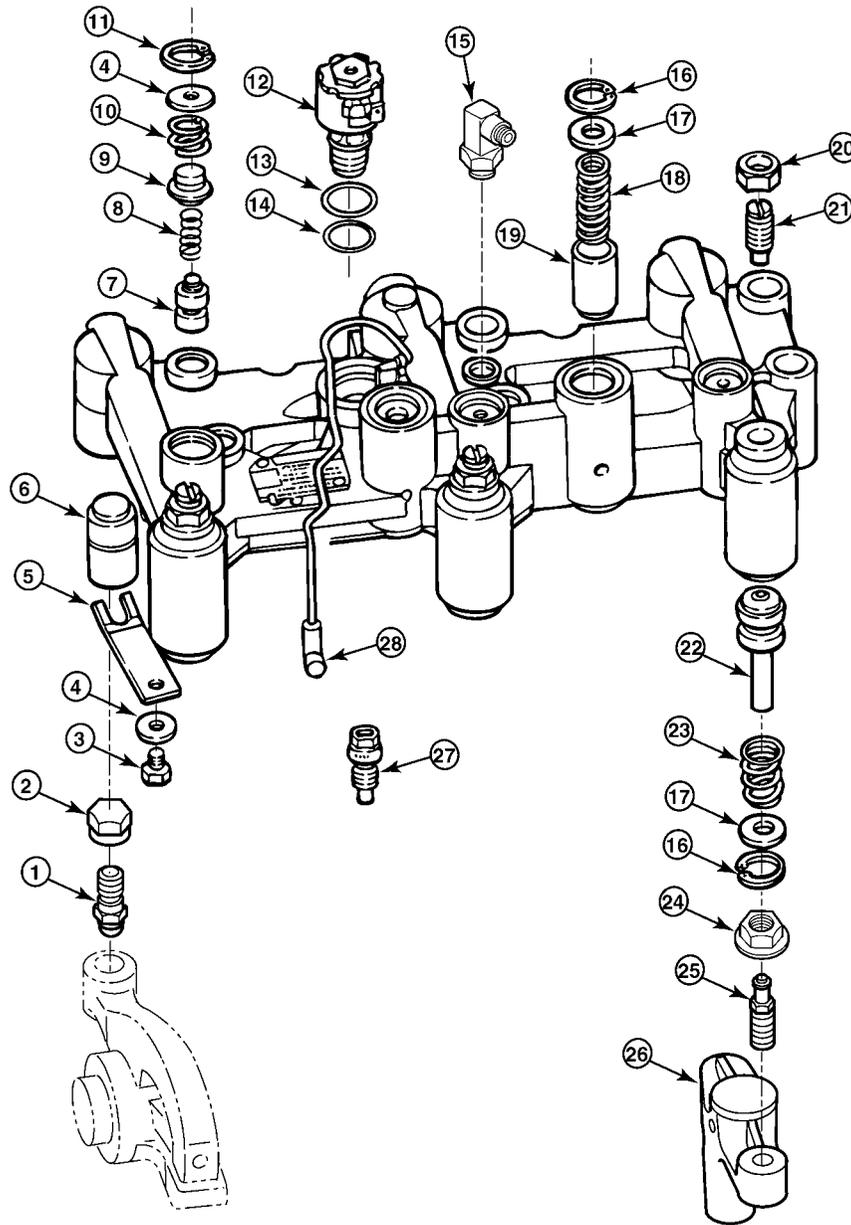
**Poor Brake Performance** — During an engine braking event, the engine sounds like the brake is functioning properly, but retarding power is limited.

**Engine Brake Drop-Out** — A more severe form of poor engine brake performance. An intermittent failure of multiple cylinders to perform the braking function, then random cycling between braking and not braking.

**Slave Lash Setting** — For the J-Tech™ engine brake, slave lash is the gap measured between the bottom surface of the engine brake slave piston and the top surface of the engine brake actuator pin. For the engine brake used on E7 engines, it is the gap measured between the slave piston and the top of the valve yoke.

## J-Tech™ Parts

Part numbers for the engine brake individual components are as follows (reference assembly model 690B [757GB59C]):



268902a

Figure 1 — J-Tech™ Engine Brake Unit — Exploded View

Key	Qty. (per assembly)	Part No.	Description
1	3	417GC310AM	Adjusting screw, rocker arm
2	3	4559-21437	Spherical locknut
3	3	4559-21740	Screw, retaining, master piston return spring
4	6	4559-16505	Washer, retaining, flat spring and control valve
5	3	4559-13158	Spring, master piston return
6	3	4559-21427	Piston, master
7	3	4559-11283	Valve, control
8	3	4559-18756	Spring, inner, control valve
9	3	4559-28149	Collar, control valve
10	3	4559-28189	Spring, outer, control valve
11	3	4559-12991	Ring, retaining, control valve
12	3	4559-1024614	Solenoid valve
13	3	4559-20229	Seal, upper
14	3	4559-O1082	Seal, center
15	1	691GC226A	Check valve fitting, oil supply, top
16	5	4559-24862	Ring, retaining, accumulator and slave piston
17	5	4559-24861	Retaining washer, accumulator and slave piston
18	2	4559-30764	Spring, accumulator
19	2	4559-30752	Accumulator piston
20	3	4559-11395	Jam nut, reset screw, 1/2-20
21	3	4559-32053	Screw, reset
22	3	4559-21423	Piston, slave
23	3	4559-30860	Single spring, slave piston
24	3	142GC243M	Flanged jam nut, actuating pin adjusting screw
25	3	421GC41CM	Actuating pin adjusting screw
26	3	891GC223M	Yoke, valve
27	1	4559-25132	Screw, oil check
28	1	4559-24223	Solenoid lead wire

**NOTE**

The solenoid lower seal (part No. 4559-O1083) is not used with engine brake models 690A or 690B. This seal is not shown in figure 3, nor is it listed in the above parts list.

## Additional Service Notes

1. ASET™ engines are equipped with either the 757GB59B or 757GB59C engine brakes, and there are no issues to resolve. To upgrade a non-brake ASET™ engine with a J-Tech™ engine brake, use kit part No. 215SB327. Currently, ASET™ engines use external oil lines to supply oil to the engine brake units. These lines, however, are not necessary with current production cylinder blocks and will be eliminated in the near future.
2. External oil lines are not required for any engine (replacement basic engine, short block or service block) having a cylinder block part number given in service bulletin SB-211-018. Improvements were made to the engine block (beginning with E-Tech™ engine serial No. 2D0001 [3/02]) which improved oil pressure, allowing the elimination of the external oil lines to the engine brake units. External oil lines were eliminated from production beginning with E-Tech™ engine serial No. 2N2969 (7/30/02).
3. Installation of the high-volume oil pump (part Nos. 315GC466M and 315GC466MX) is no longer recommended unless it is used as a very last resort when all other corrective actions have failed to resolve the performance and/or “drop-out” issues, including the appropriate troubleshooting procedures outlined in the applicable engine service manual.
4. An engine brake unit already updated to the latest configuration can be identified by the part number 032053A (part number should be legible) stamped on the reset screw, and by the engine brake ID plates being 757GB59B or C.
5. Actuating pin adjusting screws (part No. 421GC41CM) are available through the MACK Parts System. These screws are needed when an earlier engine brake is being upgraded to the latest (757GB59C) configuration.

## J-Tech Installation on Non-Brake ASET™ AC, AI and AMI Engines

If it is desired to install a J-Tech™ engine brake on a non-brake equipped ASET™ engine, the components listed in the following charts will be required. Installation instructions are given in the ASET™ Engine Service Manual, 5-109.

Parts Required for ASET™ AI and AMI Engines		
Qty.	Part No.	Description
1	215SB327	Kit, J-Tech™ ASET™
1	160AX574	BRV hose (required for AI-427 and AI-460 engines)
1	35AX1604	Spacer, stand-off, for BRV tube (required for AI-427 and AI-460 engines)
1	27AM12	Bolt, stand-off spacer retaining, M10 x 1.5 x 100 mm long
9	421GC2124M2	Bolts, cylinder head cover/engine brake spacer hold-down
5	616GC275M2	Studs, cylinder head cover/engine brake spacer hold-down
<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: 80%;"> <p><b>NOTE</b></p> <p>The total quantity of cylinder head cover/engine brake spacer hold-down studs and bolts required per engine is twelve. A quantity of 14 is listed in the table above, however, to cover the various bolt and stud combinations that may be encountered on any given engine.</p> </div>		

<b>Parts Required for ASET™ AC Engines</b>		
<b>Qty.</b>	<b>Part No.</b>	<b>Description</b>
1	215SB327	Kit, J-Tech™ installation
1	206MS55M or 206MS52DM	Mass Flow System (MFS) (refer to service bulletin SB-214-022 for information and installation instructions.)
2	449GC237M	Seal, EGR tube flange
1	682GC512M	Mixer tube
1	446GC2149	O-ring, mixer tube
1	670GC5125	BRV tube (required for AC-400, AC-380/410, AC-427 and AC-460 engines)
1	63AX1771	Fitting, oil supply, at oil filter mounting bracket
1	63AX3657	Elbow fitting, 90 degree, oil supply, at oil filter mounting bracket
1	63AX1741	Connector fitting, straight, at 90 degree elbow fitting
1	744GB348P2	Hose assembly, oil supply, pedestal-to-4-way fitting
12"	796AX6F	Convuluted tubing, 12" (304.8 mm) length, for 744GB384P2 hose assembly
1	497GB383	4-way fitting assembly (NOTE: prior to installing this fitting, it will be necessary to remove the existing threaded-top head bolt at the rear cylinder head (bolt position No. 19), and install it at the front cylinder head (bolt position No. 16). These two head bolts must be switched and torqued to 205 lb-ft (278 N•m).
1	744GB43	Hose assembly, oil supply, 4-way fitting-to-3-way fitting
1	9032-131X4	Block-off plug (must be ordered through the vendor ship-direct system)
6	421GC2124M2	Cylinder head cover/engine brake spacer hold-down bolts
6	616GC275M2	Cylinder head cover/engine brake spacer hold-down studs