The Model 126 Engine Brake is designed and approved for use on the DAF 12.6 lt Engines. Information in this manual was current at time of printing, and is subject to change without liability.
Refer to Jacobs / Daf Service Letters and Instructional Literature for specific application information.
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The following symbols in this manual signal potentially dangerous conditions to the Mechanic or Equipment. Read this manual carefully. Know when these conditions exist.

Disregarding this information may result in serious damage or personal injury..

This Symbol Refers to Possible Personal Injury.

This Symbol Refers to Possible Equipment Damage.

Indicates An Operation, Procedure or Instruction that is Important for Correct Service.

Fuels, Electrical Equipment, Exhaust Gases and Engine Moving Parts present potential HAZARDS that could result in Personal Injury. Take care when installing an engine brake. Always use correct tools and proper procedures as outlined in this manual.

The JAKE BRAKE (DEB) is a Vehicle Slowing Device, NOT a Vehicle Stopping Device. It is NOT a Substitute for the Service Braking System. The Vehicles Service Brakes must be used to bring the Vehicle to a complete stop.

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# Jake Brake (DEB) Model 126 Parts Listing

<table>
<thead>
<tr>
<th>Item</th>
<th>Jacobs P/N</th>
<th>DAF P/N</th>
<th>Description</th>
<th>Front</th>
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<td>Housing Assembly Front</td>
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<td>Screw Safety Valve Assembly</td>
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<td>Nut Hex Jam - M10 x 1.25</td>
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<td>Pipe Plug (1/16-27 Flush Seal N.P.T.F.)</td>
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## DAF Engine Parts, (Not Illustrated)

<table>
<thead>
<tr>
<th>DAF P/N</th>
<th>Description</th>
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<tr>
<td>1318161</td>
<td>Rocker Arm Adjusting Screw</td>
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<tr>
<td>0325441</td>
<td>Nut Hex (Lock-Nut) M10 x 1</td>
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<td>1262650</td>
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<td>1320441</td>
<td>Crosshead Assembly</td>
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<td>- 1317814 Crosshead</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- 1315482 Actuator Pin</td>
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<td></td>
<td>- 1316351 Retaining Ring</td>
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<td>1231062</td>
<td>Holddown Bolt M12 x 1.75 (70mm long)</td>
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<td>Holddown Bolt M12 x 1.75 (160mm long)</td>
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<td>(Solenoid to Vehicle Harness)</td>
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<td>Switch Dash 2 Position</td>
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<td>Switch Foot</td>
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## Jake Brake (DEB) Model 126 Parts View
The exploded view shown is of the front housing. The rear housing assembly has a different pattern of oil galleries, and cannot be interchanged. The Rear housing contains the same components as the front housing.
1. Introduction

**Engine Brake Housing Identification.**
Each engine brake housing assembly has an identification tag showing model number, installation location marked FRONT ASSY and REAR ASSY. The Front Assy is identified Yellow, and the Rear Assy is identified Green. The identification plate also contains the Part Number, and Housing Serial Number. (See Fig.1.)

This installation manual should be used to identify parts in the Parts Listing Section, when replacement part information is required.

**Figure 1**

**Special tools.**
No special tools are required for the installation of the DEB (Jacobs Engine Brake). The following tools should be available to work on the installation and brake components.
1) Feeler Gauge - 1.40mm (0.055 inch)
2) Jacobs Slave Piston Tool P/N 017397

**Engine Preparation.**
Clean engine thoroughly. Remove any accessory components required to remove the valve covers. Remove the two valve covers. Loosen the intake and exhaust rocker arm adjusting screw locknuts. Loosen and remove the rocker pedestal hold down bolts. Remove the DAF rocker oil supply bars, and remove the six rocker pedestal assemblies, and place in order on a work bench.

**Exhaust Rocker Arm Adjusting Screw.**
Remove the exhaust rocker arm adjusting screw locknuts and remove the standard adjusting screw. Install the locknuts onto the brake actuating adjusting screw, and install the adjusting screw into the rocker arm.

![Figure 2.](image)

Figure 2, shows the brake actuating screw (Note the large hexagon head)

Use only the brake actuating screw. The use of the standard screw will result in screw wear and engine damage.

**Exhaust Crosshead Assembly.**
Remove the six standard exhaust crossheads, loosen the crosshead levelling screw locknut, and remove the screw from each crosshead.

Install the original levelling screw and locknut into the new crosshead assembly (P/N 1320441) See figure 3

Install the new exhaust crosshead assembly to the engine, with the pin assy closest to the rocker pedestal, and reset the crosshead adjustment.

Applying a light force to the centre of the crosshead, turn the adjusting screw out until it is free.

Holding the crosshead down against its mating valve stem, turn the adjusting screw in until it touches the valve stem.

Hold the adjusting screw in this position and tighten the locknut.

Tighten the adjusting screw locknut to 54 Nm.

**Pedestal Installation.**

Clean oil from the pedestal mounting bolt holes in the cylinder head.

Place the six rocker pedestal assemblies onto the original cylinder head position, ensuring the location of the valve actuating pushrods. See Figure 4.

Refit the original rocker pedestal holddown bolts, on the longer bolts use either the oil bar or suitable spacer, tighten the bolts and to torque to 94 Nm.

**NOTE**

**Both pedestal holddown bolts MUST be used to locate the pedestal in order to set the correct valve lash adjustment.**

**Valve Lash Adjustment.**

Set the lash adjustment on both the intake and exhaust valves to DAF specification following the correct sequence.

Turn the engine crankshaft in direction of rotation of the engine, until the valves of the number 6 cylinder are in the overlap position. The piston of number 1 cylinder will be in the TDC compression position.

Adjust the intake and exhaust valve clearances on cylinder number 1 to DAF specification (0.5mm). Rotate the crankshaft one third of a turn and set the valve clearance on cylinder number 5.

Continue to rotate the engine in one third of a turn segments, and set the appropriate valves following
engine firing order (1-5-3-6-2-4).

**Brake Housing Installation.**
Remove all six long pedestal holdown bolts, and oil bar or spacers, temporarily used to locate the pedestals for valve adjustment. Ensure that the “Slave Piston Adjusting Screws” are loose and the slave pistons are fully retracted.
Place the engine brake housing assemblies on the rocker pedestals. One housing over three pedestals
See figure 5
Make sure that the Front housing is installed over cylinders 1, 2, and 3, and that the Rear housing is installed over cylinders 4, 5, and 6.

**NOTE**

*Cylinder numbers are cast into the housing casting. Incorrect positioning will effect brake performance and may create engine damage.***

Install six new long bolts P/N 1310356 M12 x 1.75 through the brake housing, rocker pedestal into the cylinder head. Install six new short bolts P/N 1231062 M12 x 1.75 through the brake housing into the rocker pedestal.
Tighten the twelve holddown bolts starting with the centre pedestal of each housing.
Torque all bolts to 94 Nm.

**Slave Lash Adjustment.**
Turn the engine in the direction of rotation until the number 1 cylinder is at the TDC compression position. (Intake and exhaust rockers both free)
Adjust the slave piston lash on cylinders number one, three, and five.
Insert a 1.40mm feeler gauge between the slave piston and the valve actuating pin in the crosshead assembly. See figure 6
Turn the slave piston adjusting screw (safety valve) in until a slight drag is felt on the feeler gauge.
Hold the adjusting screw in this position and tighten the adjusting screw locknut to 25 Nm. Recheck the slave lash

Rotate the engine one full TDC compression and set the appropriate slave piston lash on cylinders two, four, and six.

**Engine Brake Operational Check**
The DEB, Jacobs Brake, installation is now complete.
A visual inspection of the installation should be made to ensure all is complete.

**Operational check**

Bleed the brake units and check their operation. Start the engine and allow to run for a few minutes to warm up the oil and ensure full circulation.

Inspect the oil flow from the rocker lubrication ports in the housing base. (Note, the rocker oil lubrication bar has been replaced by the brake housing assembly) A permanent drip should be observed from all six drip ports.

! WARNING

Whenever the engine is running with the rocker covers removed, oil splashing WILL occur. Always wear suitable protective clothing and eye protection, to prevent personal injury. DO NOT work directly over the engine.

To bleed the brakes, accelerate the engine to approximately 2000 RPM, release the throttle and manually activate each brake solenoid. The solenoid is activated by depressing the armature through the hole in the centre of the top face.

Repeat this procedure five to six times to fully bleed the brake housings.

Visually inspect the operation to ensure that all cylinders operate.

**Solenoid Electrical Connection.**

Remove theblanking plug from each rocker cover spacer. (Plug located on the intake side of the engine)

Thread the engine harness (solenoid to harness) P/N 1310109, through the spacer, and attach the cable locating plug to the spacer using the M6 x 1 mm bolt supplied

Attach the harness to the solenoid terminals, and route the harness along the brake housing, attaching each with the 3 M6 x 1 bolt and ring clamp supplied P/N 1315448  torque the bolts to 8.6 Nm.

**Installation of the Valve Covers.**

Visually re-inspect the installation to ensure all adjustments have been made, and that the wiring installation is clear of all moving components.

Clean the valve covers, and inspect the sealing cords for damage. Replace as required.
Place the valve covers over the brake housings and tighten the 14 M8 x 1.25 bolts in each cover to 20 Nm.
Electrical System Installation  2.

The DAF control system consists of a “Foot” operated switch, and a selector switch on the dash.

Performance Selection;
Dash switch in off position, “Exhaust Brake Only”.
Dash switch in the on position, Combination Braking.

Combination Braking refers to both DEB, Jacobs Engine Brake, and Exhaust brake used together.

NOTE, For wiring schematic please refer to DAF.
Operational Inspection  3.

Always wear eye protection;
Do not expose your face over the engine area
Take precautions to prevent oil leakage onto
the engine when the engine is running with the
valve covers removed.
HOT Oil splashing in the engine brake area
could cause personal injury.

After the engine brake has been installed on the
engine, check for proper operation as follows.

To bleed the engine brake units and check their
correct operation, start the engine and allow to run
for 5 to 10 minutes. With the engine brake switched
off, accelerate engine to approximately 2000 RPM.
Release the throttle and depress each solenoid
armature. Repeat this procedure five or six times
to permit the engine oil to fill the brake housings.

Engine oil pressure must be at least 2.0 Bar to operate
the brake. Refer to engine brake flow plate
on the housing for master piston, control valve, and
slave piston relationship.

Hydraulic Flow Pattern

If any of the master pistons or slave pistons do not
move when the solenoids are activated, shut down the
engine and check the following.

1. Master Piston; Push down the master piston
spring. The master piston should move freely out of
the housing. If it is stuck in the bore, remove the
housing to inspect piston and piston bore for damage.
If damaged the piston and/or the housing must be
replaced. Note Master piston can only be
removed

2. Control Valve; Remove the control valve and
inspect for damage. The control valve should move
freely in the bore. If not replace the control valve
or housing as necessary.
Check the control valve ball check. Insert a small
diameter wire into the hole in the bottom of the
control valve. The ball check should move with light
pressure. If it does not, replace the control valve.
3. Slave Piston; The housing must be removed to inspect the slave piston. Follow the disassembly in the maintenance section of this manual to remove the slave piston. With the slave piston springs removed, move the piston up and down in its bore. The piston should move freely without binding. If it does not, the slave piston and/or housing bore may be damaged.

Replace piston and/or housing as required.

4. Slave Piston Adjusting Screw; Remove the slave lash / safety valve adjusting screw, inspect the plunger protrusion and face of the plunger. The plunger should protrude 2.7 ± 0.15 mm from the body of the screw. Push the plunger up into the body of the screw, the plunger should be free and move with very little force. Release the plunger and it should immediately return to the full protrusion. The face of the screw should have a good clean area, and show no signs of damage.

5. Solenoid Valve; With the engine shut down and the electrical system turned on, (key switch on, engine brake switch selected), operate the foot switch. The solenoid valve armatures should move down. This can normally be observed by listening for a click, and watching the armature through the hole in the centre of the solenoid valve top. If the solenoid valve does not activate, use a volt / amp / ohm meter and check the voltage to the solenoid valve. The reading should be at a minimum 18volts cold, and 22 volts hot. If there is not the correct voltage to the solenoid valves, check all the wiring and connections. Repair as required. If there is correct voltage to the solenoid, and it does not activate, check the solenoid valve per specification in the brake specification section. Section 5. Replace the valve as required.
NEVER REMOVE ANY ENGINE BRAKE COMPONENT WITH THE ENGINE RUNNING.
PERSONAL INJURY MAY RESULT.

The Jacobs Engine Brake, is a typically trouble free device. However periodic inspections are necessary and some maintenance is required. Jacobs recommends the following maintenance at the time of engine overhaul.

This section covers how to properly remove, clean and reinstall Jacobs Brake components. Be sure to use clean lubricated parts when reinstalling them.

**Control Valve:**

**WARNING**

Remove Control Valve Retainer Carefully. Control Valve retainers are under load from the Control Valve Springs. Remove with care to avoid personal injury.

There are three control valves per housing.

Using the control valve cover removal tool, press down on the control valve cover to relieve spring pressure and remove the retaining ring using retaining ring pliers.

Slowly remove the cover until spring pressure ceases, then remove the retaining ring, spring retainer, and the two control valve springs.

Using needle nose pliers, remove the control valve. The control valve should be free. If any binding occurs inspect the control valve and bore. Replace as required.

Control Valve Assembly

Clean the control valve and inspect as follows.
Control Valve Inspection.
Push a thin wire through the hole in the base of the valve to ensure that the ball is free. The ball should lift with light pressure on the wire. If the ball is stuck, replace the control valve.

Inspect the control valve body for sign of scratching or other deformities. Replace as necessary.

Thoroughly clean the valve bore in the housing using clean paper towels. Inspect the bore for scratching. Dip the control valve in clean lube oil and replace the valve in its bore. The valve must be free, and should fall under its own weight.

Reinstall the springs, cover and retaining ring. **Make sure the retaining ring is fully located in the retaining ring groove.**

**Solenoid Valve.**

**Do Not**
*Disassemble or Tamper with the Solenoid Valve. Engine Damage Could Result*

Disconnect the harness from the solenoid valve. Using a 19mm 12 point socket, unscrew the solenoid valve.

Remove and discard the three rubber seal rings from the solenoid valve. See Picture. The lower ring usually remains in the bottom of the housing solenoid bore, remove with a seal pick.

Clean the solenoid valve using a brush and clean solvent, to clean the oil screen. When clean dry Solenoid and Seals, with compressed air.

Check solenoid coil resistance with an OHM meter, against the specification in the engine brake specification section.

Clean out the solenoid valve bore in the housing using cleaning solvent and clean paper towels.

Never use rags as they may leave lint and residue which can plug the oil passageways.
Coat new solenoid valve seal rings with clean lube oil. Install the upper and centre seal rings on the solenoid valve body, inspect to assure that both seals are seated flat. Install the lower seal ring into the bottom of the solenoid valve bore in the housing. Check to insure that the seal ring is flat on the bottom of the bore.

Insert the valve into the bore. The centre seal must slip smoothly into the bore. Carefully screw the solenoid valve into the housing without unseating the seals. Hand tighten in the bore. Resistance to hand tightening may signal that a seal (s) is not centred or is twisted. If resistance to tightening is found, reverse rotation 1/4 turn and retighten by hand. If resistance continues after reverse rotation and retightening, remove the solenoid and visually inspect the solenoid and bore. Replace any pinched or twisted seal (s) and reinstall.

Once hand tight, torque the solenoid valve to 20 Nm. Over-torquing will distort the seal rings, and damage the solenoid valve.

**Slave Piston**

**WARNING**

WEAR SAFETY GLASSES
Remove Slave Piston Carefully. The Slave Piston is retained by springs under Heavy Compression. If these INSTRUCTIONS are not followed, and Proper Tools not used, the springs could be discharged with enough force to cause Personal Injury.

Remove the jam nut (locknut) from the slave piston adjusting screw. Back out the adjusting screw until the slave piston is fully retracted. (The screw is loose)

Place the hole in the Jacobs Slave Piston Tool P/N 017397, over the slave piston adjusting screw.
Turn the handle slowly in a clockwise direction, until the retainer is depressed about 1mm, relieving the pressure against the retaining ring.

Remove the retaining ring with retaining ring pliers. Back out the slave piston tool by turning the handle counter clockwise until the springs are no longer under load. Remove the slave piston tool.

Remove all components, checking that there is no binding or burrs.

Clean all components and inspect the slave piston, for signs of scouring. Inspect the top face of the slave piston. If the contact area of the piston and adjusting screw shows wear greater than 0.05mm, replace the adjusting screw.

Thoroughly clean the slave piston bore in the housing using clean paper towels. Inspect the bore for scratching.

**NOTE**

**Be sure to reassemble components in the proper order, to ensure safe operation.**

Dip the slave piston in clean lube oil, and replace the piston in its bore. Reinstall the valve springs and retainer over the slave piston stem. Using the slave piston tool compress the slave piston springs until the retainer is about 1mm below the retaining ring groove. Reinstall the retaining ring. To ensure correct seating of the retaining ring, visually verify that the installed gap between the retaining ring ears is at least 5.4mm.

Release the tension on the retaining ring tool slowly, to assure retaining ring is properly seated.

Reinstall the adjusting screw and locknut, do not tighten. Follow installation instruction for proper procedure on setting slave piston lash.
Slave Piston Adjusting Screw

! CAUTION

Do not Disassemble or Tamper with the Slave Piston Adjusting Screw.
ENGINE DAMAGE COULD RESULT.

Loosen the slave piston adjusting screw locknut, and remove the slave piston adjusting screw (safety Valve) from the housing.

Inspect the adjusting screw. The plunger valve should protrude from the bottom of the screw body 2.7mm (+/- 0.15mm)
The plunger should reset itself quickly from a fully depressed condition.
Inspect the face of the plunger, if any sign of wear is evident replace the screw.

Clean the adjusting screw assembly in clean solvent before reusing or replace as necessary.
The screw assembly CANNOT be serviced.

Master Piston.

Remove the screw, washer and master piston spring from the bottom of the housing.

Remove the master piston from its bore using needle nose pliers. Check for binding, the master piston should be free in the bore.

Clean the master piston in clean solvent. Inspect for scratching or burrs on the piston outer surface.
Inspect the hardface surface of the piston. Pitted, Cracked or Galled pistons MUST be replaced.

NOTE

IF THE HARDFACE IS DAMAGED, INSPECT THE CORRESPONDING SCREW FOR EXCESSIVE WEAR OR PITTING. REPLACE IF DAMAGED.

Thorougly clean the master piston bore in the Master housing using clean paper towels.
Inspect the bore for scratching or wear. If damaged replace the housing assembly.
Inspect the master piston flat spring for wear at the legs, and replace if wear in the master piston contact area is evident.

Reassemble in the reverse order. Dip the master piston in clean lube oil, and replace in its bore. The master piston should be free. Refit the flat spring, washer and screw, when tightening the screw, ensure that the two spring legs DO NOT interfere with the sides of the master piston hard facing. (Raised centre section)

Torque the hex head screw to 12.5 Nm. Recheck the clearance of the spring legs.

Check the master piston spring for relaxation. If the spring does not retain the master piston fully into it bore, replace the spring.
Engine Brake Specification

Oil Pressure Requirements
Proper operation of the engine brake can only occur when the engine oil pressure supplied to the engine brake housing is within the full flow range of the control valve spring. See chart 1. Oil pressure below the full flow figure will not supply the engine brake sufficient oil flow to operate properly. Oil pressure above the full flow rate will have the same effect up to the point at which the over pressure spring causes the engine brake to stop functioning entirely.

Chart 1.
Control Valve Spring P/N 018756
Outer Spring P/N 019632
Min Operating Pressure 2.0 Bar.
Max Operating Pressure 4.5 Bar
Over Pressure 8.0 Bar

Solenoid Valve Specification.
The solenoid valve cannot be overhauled or repaired in the field. The only way to determine a correctly operating solenoid coil, is with a Volt/AMP/OHM meter. If the solenoid does not compare with the specification in Chart 2, it must be replaced.

Chart 2
Solenoid Valve P/N 020235 24v D/L

Resistance Check..
(Must be checked at the solenoid valve)
Cold (20° C) 32.6 - 36.8 ohms
Hot (80 - 100°) 41.8 - 46.1 ohms

Current Draw with 24V Applied.
Cold (20° C) 0.652 - 0.736 amps
Hot (80 - 100°) 0.520 - 0.570 amps

Pull-in Voltage (minimum)
Cold (20° C) 18.0 volts
Hot (80 - 100°) 22 - 24 volts

Slave Piston Lash Setting (clearance)
Slave Lash 1.40 mm +/- 0.05 mm.

Torque Specifications
Rocker Holddown Bolts 94 Nm ± 8
Brake Housing Holddown Bolts 94 Nm ± 8
Rocker Adjusting Screw Locknut 54 Nm ± 4
Crosshead Adjusting Screw Locknut 54 Nm ± 4
Slave Lash Adjusting Screw Locknut 25 Nm ± 3
Cover Bolts 20 Nm ± 3
Harness Bolts 8.6 Nm ± 0.7

Wear Limits.
Wear limits for Master Piston, Slave Piston, Control Valve and Housing Bores (mm)

Master Piston  P/N 017609
Slave Piston  P/N 021023
25.374 - 25.387  Limit 25.360
Control Valve  P/N 011930

Housings. P/N 021019 / 021020

Master Piston Bore 13.754 - 13.767  Limit 13.803
Slave Piston Bore 25.400 - 25.413  Limit 25.450

Parts which exceed the limits given above MUST be replaced.
Trouble Shooting  6.

Problem: Engine fails to start

Probable Cause: Solenoid valve stuck in “on” position.

Correction: Ensure that electrical current is off to engine brakes. If solenoid valve remains “on” (armature down) with current off, replace solenoid valve.

Problem: Engine Brake will not operate

Probable Cause: Blown fuse, open electrical leads.

Correction: Look for short circuit in wiring. Replace any broken, brittle or chafed wires. Check solenoid tab for signs of shorting; replace if necessary. Replace fuse (10 amp).

Probable Cause: On/Off switch, foot switch, throttle switch or multi-position switch out of adjustment or defective.

Correction: Use a volt/ohm meter to make certain that there is electrical current available at both terminals of each switch. Re-adjust if needed or replace if voltage will not pass through switch.

! WARNING

Do not touch electrical when system is energised.

Probable Cause: Incorrect electrical power source

Correction: Power supply must be a minimum of 24 VDC for 24v Vehicles. Recommended power source is from the key switch “on” position. Ensure that power is not taken from a source with an additional on/off switch, i.e, light switch. Make sure wiring is in accordance with DAF installation manual for brake model.

Probable Cause: Low engine oil pressure.

Correction: Determine oil pressure at engine brakes using specification given in this manual for oil pressure requirements. If oil pressure is below specifications, engine should be repaired in accordance with DAF procedures.

Problem: Engine brake activates with switches open (off)

Probable Cause: Centre solenoid valve seal ring damaged.

Correction: Replace solenoid. Replace all seal rings.

Problem: Engine brake improperly wired.

Correction: Check wiring in accordance with DAF wiring diagrams.

Problem: Engine brake slow to operate or weak in effect

Probable Cause: Lube oil cold and thick.

Correction: Allow engine to warm before operating brakes.

Probable Cause: Improper slave piston or slave piston binding in bore.

Correction: Re-adjust in accordance with Jacobs procedures, see Installation and Specification sections of this manual. Ensure that slave
piston responds smoothly to the adjusting screw by loosening jam nut and screwing the screw through its full travel for full slave piston motion. Make sure piston travels full range without binding or sticking.

**WARNING**

Remove slave piston carefully when disassembly is necessary. Use Jacobs Slave Piston Tool. P/N 017397

Slave Piston Springs are under HEAVY Compression

**Probable Cause:** Lower solenoid seal damaged allowing oil to exit the housing.

**Correction:** Remove solenoid valve and replace all seal rings.

**Probable Cause:** Solenoid screen clogged stopping supply of oil to brake.

**Correction:** Remove solenoid valve and clean or replace screen.

**Probable Cause:** Master piston not moving in bore

**Correction:** Inspect master piston and bore for scoring or burrs. If any are present, clean surface with crocus cloth. If unable to remove burrs, replace piston or housing. Inspect lube oil for signs of contaminants. If any are present, replace oil and filter and correct cause of contamination.

**Probable Cause:** Control valves binding in housing bore.

**Correction:** Remove control valve. If body is scored, replace control valve. Check for contaminants in lube oil. Clean housing and control valve. If binding continues, replace housing.

**Probable Cause:** Control valve defective

**Correction:** Remove control valve. Make sure check ball is seated in bore and can be moved of seat. Make sure there is spring pressure against the ball. Flush in cleaning solvent. Replace if necessary.

**Probable Cause:** Switch operation sluggish. Check dash switches, foot switch, throttle switch, or other control switches.

**Correction:** Re-adjust or replace switch. Check throttle or foot switch return springs for proper operation. Check all controls for operation, replace as required.

**Probable Cause:** Solenoid valve operation erratic.

**Correction:** Check solenoid valve using electrical specifications explained in this manual or, with key on, brake switches on, and engine off, activate solenoid electrically. Ensure solenoid armature depresses.

**Do not touch electrical connection when system is energised.**

**WARNING**

**Probable Cause:** Outer control valve spring broken, or engine oil pressure extremely high (see specification)

**Correction:** Outer control valve spring broken allowing control valve to over-index. Problem is engine lube system. Consult appropriate engine repair manual for causes of high lube oil pressure.

**Problem:** Oil pressure dropping below minimum required for engine brake operation
**Probable Cause:** Upper solenoid seal ring damaged.

**Correction:** Remove solenoid. Inspect seal ring and replace all seal rings.

**Probable Cause:** Damaged oil supply seals under or between housings.

**Correction:** Remove housing and replace seals. Inspect for cracked or broken oil connectors, replace seals.

**Probable Cause:** Aeration of lubricating oil.

**Correction:** Check for aeration of the oil. Activate, then deactivate engine brake. Watch escape oil coming from control valve cover. If oil has bubbles or is foamy, air is present in system. Aeration can be caused by an overfull or underfull crankcase, crack in oil pickup tube or leaks in oil suction tube or hose. Correction is in accordance with manufacturers’ procedures.

**Probable Cause:** Lubricating oil being diluted by fuel oil.

**Correction:** Have an oil analysis of lube oil to determine if fuel is present. Correct per engine manufacturer’s procedures.

**Probable Cause:** Low engine oil level.

**Correction:** Consult engine manual for specifications. Add oil or recalibrate dipstick as required.

**Probable Cause:** Worn engine rocker level bushings.

**Correction:** Replace bushings in accordance with engine manufacturer’s procedures.

**Probable Cause:** Oil leaking from around cylinder head.

**Correction:** Repair causes of leaks.

**Probable Cause:** Restrictions in the oil passages leading to engine brake.

**Correction:** Inspect all the passageways, remove any items restricting oil flow.

**Problem:** One or more cylinders fail to stop braking or engine stalls

**Probable Cause:** Control valve inner spring broken.

**Correction:** Replace inner spring

**Probable Cause:** One or more control valves stuck in “on” or up position.

**Correction:** Check control valves for binding. Remove and clean or replace if necessary. Inspect lube oil for contaminates.

**Probable Cause:** Solenoid valve sticking in “on” position.

**Correction:** If solenoid valve cap remains down with no electrical current being supplied, replace solenoid valve.

**Probable Cause:** Centre solenoid seal ring damaged. Allows oil to enter brake with solenoid valve closed.

**Correction:** Remove solenoid and replace all seal rings.

**Probable Cause:** Solenoid valve exhaust plugged.

**Correction:** Remove any restrictions at exhaust (bottom) of solenoid valve.
Probable Cause: Clutch switch or throttle switch stuck in “on” position or out of adjustment.

Correction: Check for proper operation. Re-adjust or replace as needed.

Problem: Engine misses or loses power

Probable Cause: Slave piston adjustment too tight.

Correction: Re-adjust slave piston clearance in accordance with appropriate Jacobs installation manual.

Problem: Sudden drop in engine lube oil pressure

Probable Cause: Upper solenoid valve seal missing or damaged.

Correction: Remove solenoid and replace upper seal ring.