

TO: SERVICE MANAGER TECHNICIANS
PARTS MANAGER

No. 89-3

MerCruiser Diesel Injector and Injection Pump Troubleshooting and Servicing

Because of the complexity of the Bosch Injection Pump and Injectors and the availability of authorized Bosch Service Dealers in North America, MerCruiser will not be offering internal replacement parts or repair procedures to rebuild the pump or injectors. The pump and injectors must be sent to an authorized Bosch Service Center.

When shipping an injection pump to a servicing center for adjustments or repairs, the fuel return line banjo fitting must accompany the unit. The banjo fitting incorporates a sized orifice for proper pressure which is matched to that pump. The pump cannot be adjusted properly without the matched orifice.

Accompanying this bulletin is a troubleshooting guide and a list of authorized distributors throughout the United States and Canada. Contact the distributor nearest you for the location of an authorized Bosch Service Center. Outside the United States and Canada contact your Marine Power International Branch or Marine Power International Distributor Service Office.

Bosch Diesel Distributor List U.S.A.

Alabama

Fuel & Electric Systems, Inc.
1726 Third Ave. South
Birmingham, AL 35233
Tel. (205) 251-9404

Arizona

Southwest Diesel & Electrical Corp.
1830 N. 27th Ave.
Phoenix, AZ 85009
Tel. (602) 269-2471

California

H.G. Makelim Co.
1520 S.Harris Ct.
Anaheim, CA 92806
Tel. (714) 978-7714

H.G. Makelim Co.
219 Shaw Rd.
South San Francisco, CA 94080
Tel. (415) 873-4753

Colorado

Central Motive Power, Inc.
6301 N. Broadway
Denver, CO 80216
Tel. (303) 428-3611

Florida

Everglades Diesel Inj. Service, Inc.
243 S.W. 33rd Ct.
Ft. Lauderdale, FL 33315
Tel. (305) 522-1780

Interstate Dieselect, Inc.
4220 N. Orange Blossom Tr.
Orlando, FL 32804
Tel. (407) 293-7971

Georgia

Diesel Injection & Electric Co.
231 Main St.
Forest Park, GA 30050
Tel. (404) 361-2222

Kentucky

Diesel Injection Service Co., Inc.
4710 Allmond Ave.
Louisville, KY 40214
Tel. (502) 361-1181

Louisiana

Gerhardt's Inc.
819 Central Ave.
Jefferson, LA 70181
Tel. (504) 733-2500

Maine

C.A. Krohne & Sons, Inc.
500 W. Columbus Ave.
Springfield, MA 01105
Tel. (413) 781-5824

Michigan

Diesel Equipment Sales & Service, Inc.
578 E. Main St.
Pottersville, MI 48876
Tel. (517) 645-7684

Minnesota

Diesel Service Co.
2567 Kasota Ave.
St. Paul, MN 55108

Montana

Original Equipment, Inc.
905 Second Ave. North
Billings, MT 59101
Tel. (406) 245-3081

New York

A & D Diesel Service, Inc.
143 21st St.
Brooklyn, NY 11232
Tel. (718) 788-4222

Syracuse Diesel & Electric, Inc.
105 Baker St.
Syracuse, NY 13206
Tel. (315) 463-8573

North Carolina

Diesel Equipment Co.
212-220 Atwell Ave.
Greensboro, NC 27406
Tel. (919) 373-8331

Oregon

Automotive Products, Inc.
1700 S.E. Grand Ave.
Portland, OR 97214
Tel. (503) 234-1947

Pennsylvania

Sullivan Brothers, Inc.
Creek Rd. & Langoma Ave.
Elverson, PA 19520
Tel. (215) 942-3686

Automotive Ignition Co., Inc.
301 Meade St. at Trenton Ave.
Pittsburgh, PA 15221
Tel. (412) 243-3080

Tennessee

Automotive Electric Corp.
3250 Millbranch Rd.
Memphis, TN 38116
Tel. (901) 345-0300

Texas

Spitzer A & I Products Co.
1055 Hawkins
El Paso, TX 79926

Magneto & Dsl. Injector Service, Inc.
6931 Navigation Blvd.
Houston, TX 77011
Tel. (713) 928-5686

Utah

Dsl. Electric Service & Supply Co., Inc.
652 W. 1700 South
Salt Lake City, UT 84104
Tel. (801) 972-1836

Virginia

Virginia Diesel Service, Inc.
1120 Bruce St.
Richmond, VA 23224
Tel. (804) 232-8988

Washington

Seattle Injector Co., Inc.
1410 Airport Way South
Seattle, WA 98134
Tel. (206) 623-1135

Wisconsin

Diesel Injection Service, Inc.
216 Wilburn Rd.
Sun Prairie, WI 53590
Tel. (608) 837-7358

Bosch Diesel Distributor List Canada

G.C.L. Diesel Injection Service
15842 - 112th Ave.
Edmonton, ALBERTA T5M 2W1
Tel. (403) 453-6786

Dynamic Engineering Inc.
1270 Frances St.
Vancouver, BRITISH COLUMBIA V6A 1Z5
Tel. (604) 253-4427

Diesel Injection Sales & Service
122 George St.
St. John's NEWFOUNDLAND A1C 1M8
Tel. (709) 726-6774

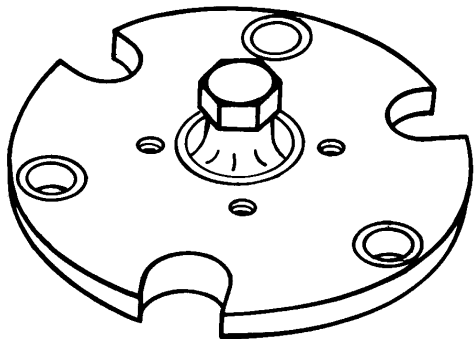
Cadel, A Division of UAP
240 Bridgeland Ave.
Toronto, ONTARIO M6A 1Z4
Tel. (416) 781-9351

Cadel, A Division of UAP
1080 Monte de Liesee
Montreal, QUEBEC H4S 1J4
Tel. (514) 331-4616

Robinson Diesel Injection
850 - 56th St. East
Saskatoon, SASKATCHEWAN S7K 5Y8
Tel. (306) 934-8040

MerCruiser Diesel Injection Pump Timing

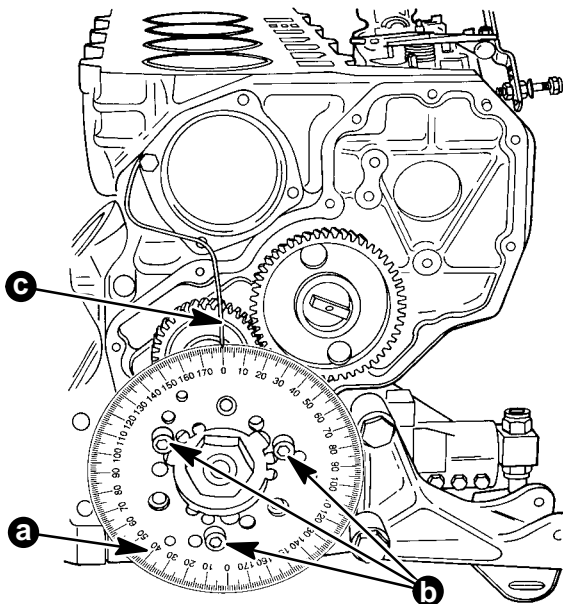
Injection Pump Installation/Timing (Engine Reassembly)



70485

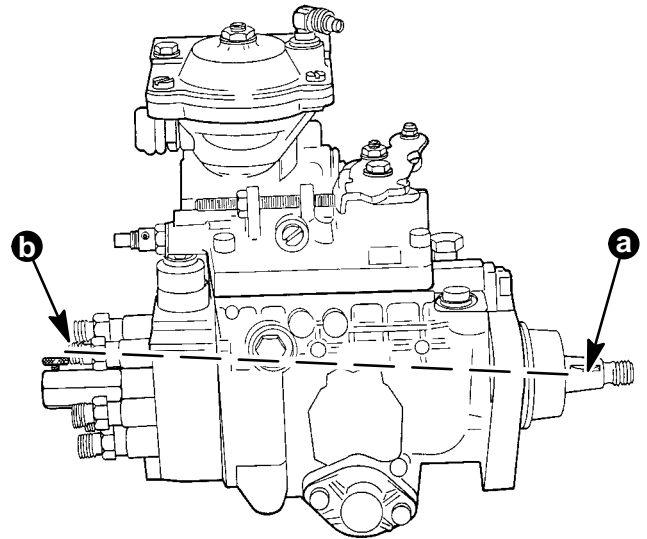
NOTE: Crankshaft tool P/N 91-814827 shown bolts on to crankshaft pulley with balancer and power steering pulley removed. Tool will also fit over graduated disc tool if necessary.

1. Turn crankshaft until number 1 piston is at top dead center on its compression stroke.
2. Install crankshaft pulley with power steering pulley and engine balancer removed.
3. Attach graduated disc tool P/N 91-80133350 (a) to crankshaft pulley, with zero ("0") positioned as shown, using pulley bolts (b).
4. Using a suitable gauge wire, make a pointer (c) and attach it to a suitable location on the block. Align pointer to zero ("0") as shown.



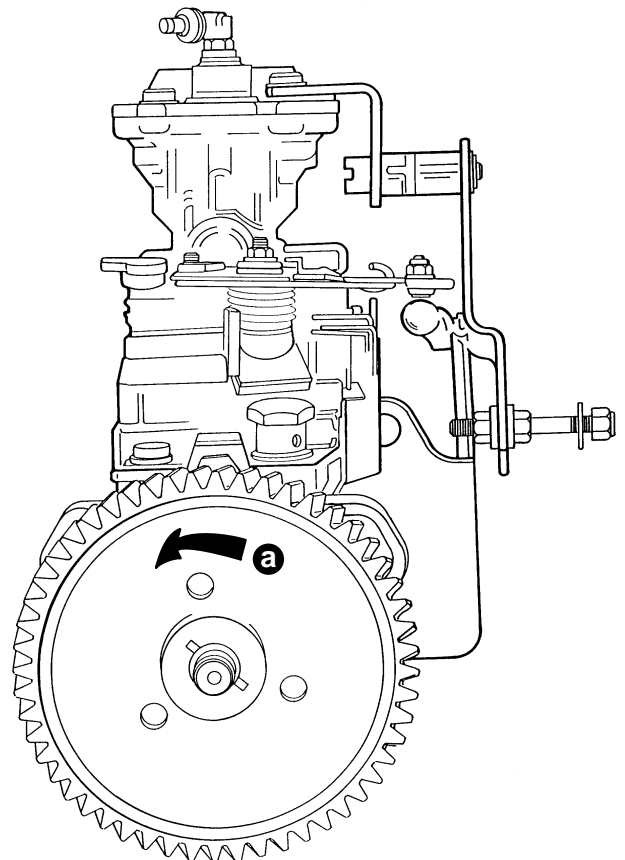
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5. Install injection pump gear and key on injection pump shaft. Rotate shaft and gear to align keyway (a) with number one injector port (b) as shown.



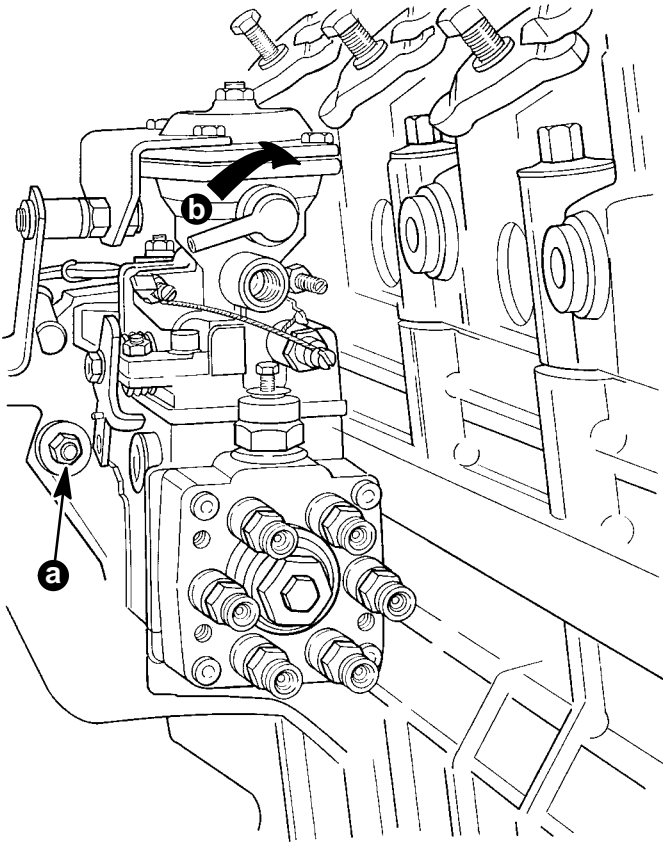
70420

6. Rotate gear counterclockwise (a) until resistance is felt removing any pump backlash.

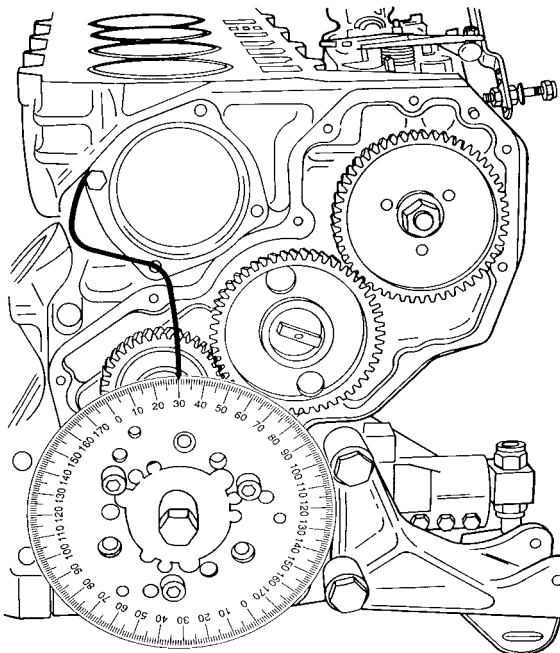


70421

7. Remove gear.
8. Install injection pump using new gasket. Turn hex nuts (a) finger tight. Rotate pump to end of adjustment slot travel in direction shown (b).



9. Turn crankshaft counterclockwise 30° as shown.

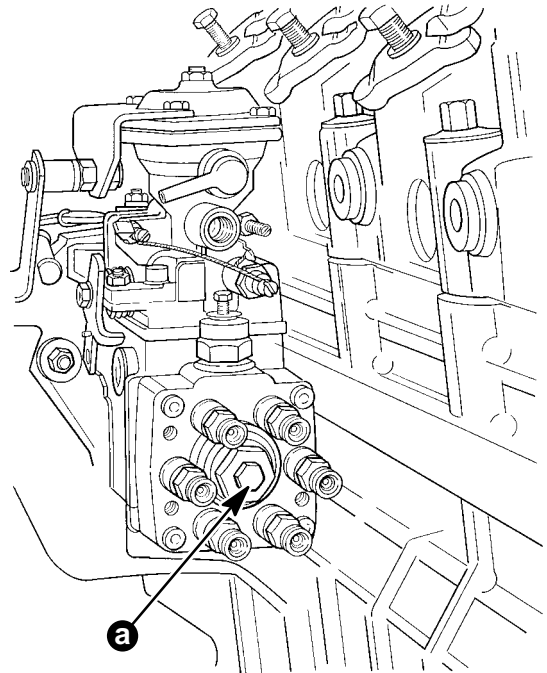


70424

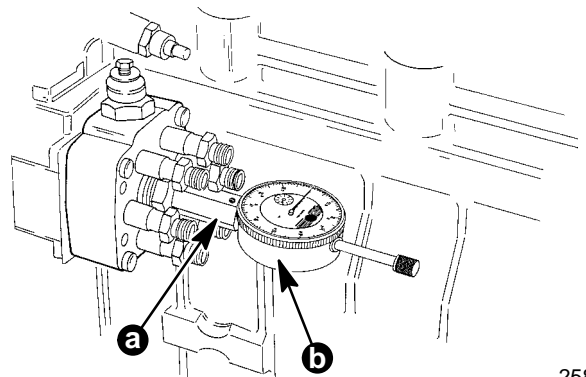
10. Apply grease to hold key in slot of pump shaft.
11. Install gear on injection pump, using whichever key slot on gear that allows gear to be installed the easiest. (Crankshaft may be turned clockwise up to 10° to assist in installing gear).

IMPORTANT: Do not force gear on shaft.

12. Make certain key is still in position.
13. Secure gear to shaft with lockwasher and hex nut. Torque to 20 lb. ft. (27 N.m).
14. Remove vent screw (a) and seal from rear of injection pump.



15. Install adaptor tool and dial indicator as shown.

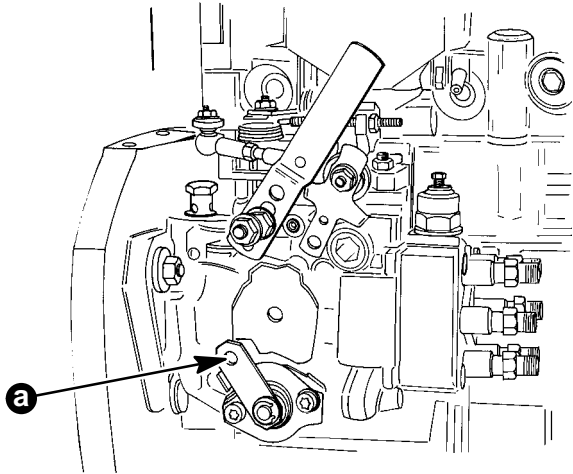


25823
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- a - Adaptor Tool
- b - Dial Indicator

NOTE: Internal bore of adaptor tool is of two different sizes. Adaptor tool P/N 91-813658 is designed to use with S.A.E. inch dial indicator. Adaptor tool P/N 91-80133510 is designed to use with millimeter dial indicator.

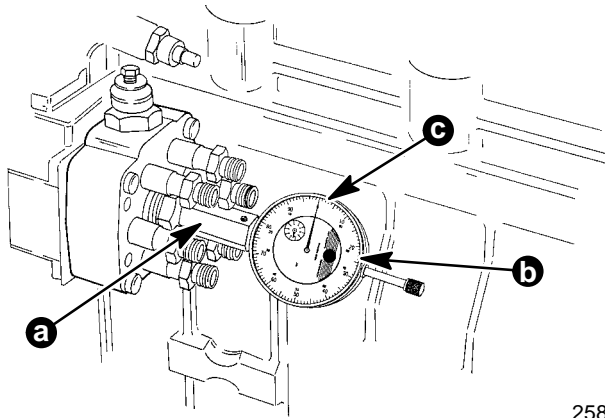
IMPORTANT: Cold start lever (a) must be in the "OFF" position (forward) as shown before proceeding.



25817

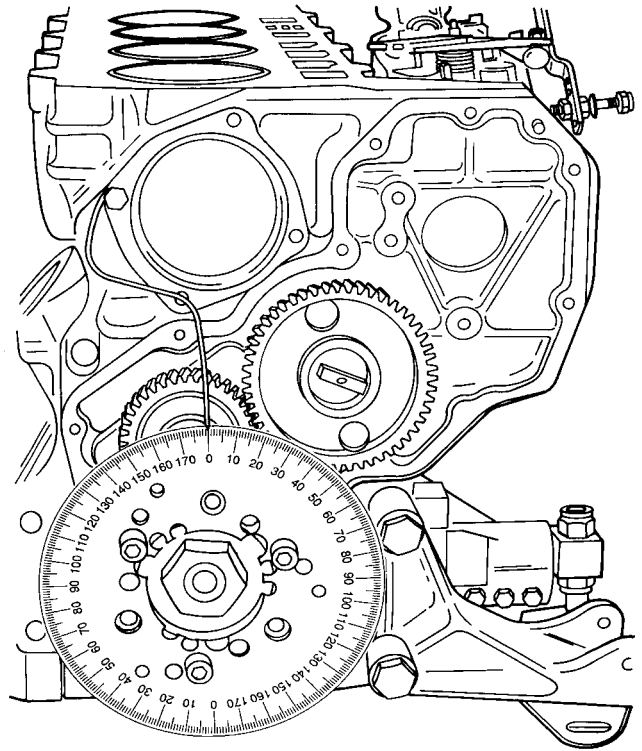
16. Turn crankshaft clockwise until dial indicator just starts to move.

17. Zero dial indicator as shown.



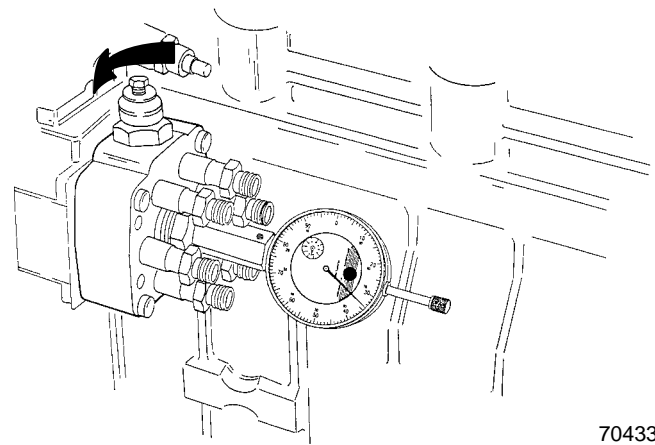
25821

18. Turn crankshaft clockwise to ("0") (top dead center) as shown.



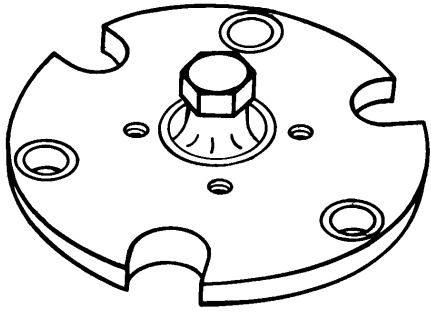
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19. Rotate injection pump in direction shown until a reading of .034 in. (.88mm) is indicated on dial indicator, tighten hex nuts securely. Dial indicator reading must not change.



70433

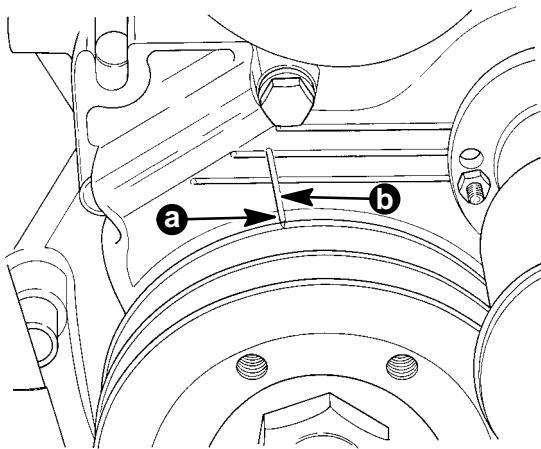
Checking Injection Pump Timing (Pump Installed)



70485

NOTE: Crankshaft tool P/N 91-814827 shown bolts on to crankshaft pulley with balancer and power steering pulley removed.

1. Turn crankshaft until number 1 piston is at top dead center on its compression stroke. Align the timing mark on the crankshaft pulley (a) with timing mark on the timing gear cover (b) as shown.



25819

2. Remove throttle cable and bracket.
3. Remove fuel injection lines.

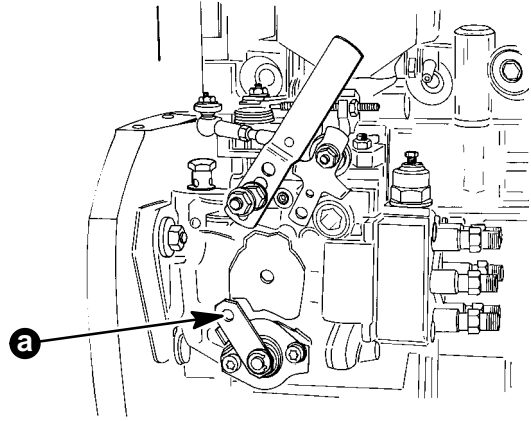
CAUTION

Keep injector, injector lines and injection pump fittings clean. Do not allow dirt to enter fittings or lines when removing or storing. Dirt will cause injectors or injection pump to malfunction. Use caps to prevent dirt from entering fittings and lines.

CAUTION

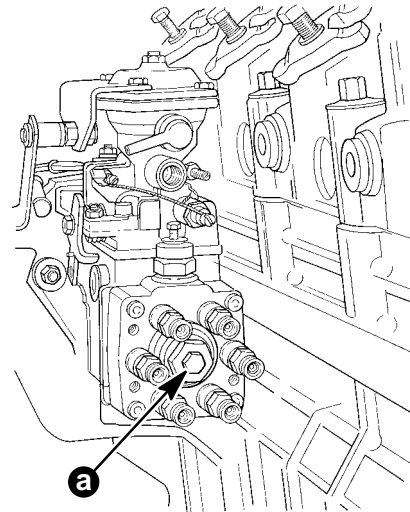
Do not bend fuel injector lines. Bending may cause metal to flake off inside lines, causing injectors or injection pump to malfunction.

IMPORTANT: Cold start lever (a) must be in the "OFF" position "FORWARD" as shown before proceeding.



25817

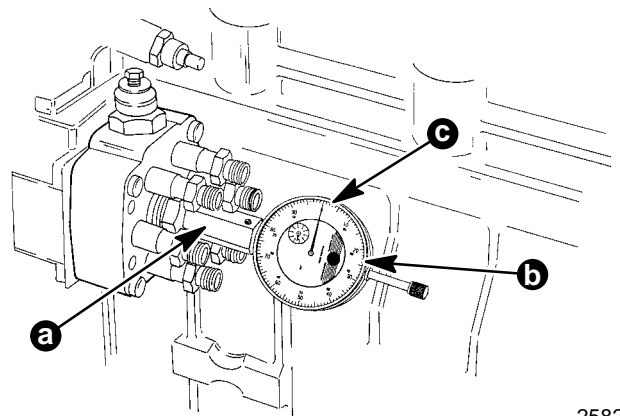
4. Remove vent screw and seal (a) from rear of injection pump.



25823

5. Install adaptor tool (a) and dial indicator (b) as shown.

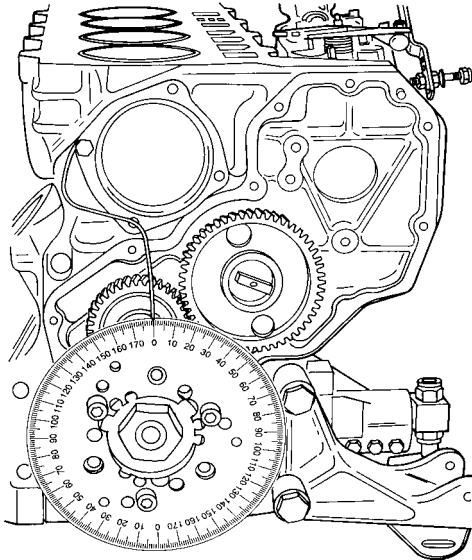
NOTE: Internal bore of adaptor tool is of two different sizes. Adaptor tool P/N 91-813658 is designed to use with S.A.E. inch dial indicator. Adaptor tool P/N 91-801333510 is designed to use with millimeter dial indicator.



25821

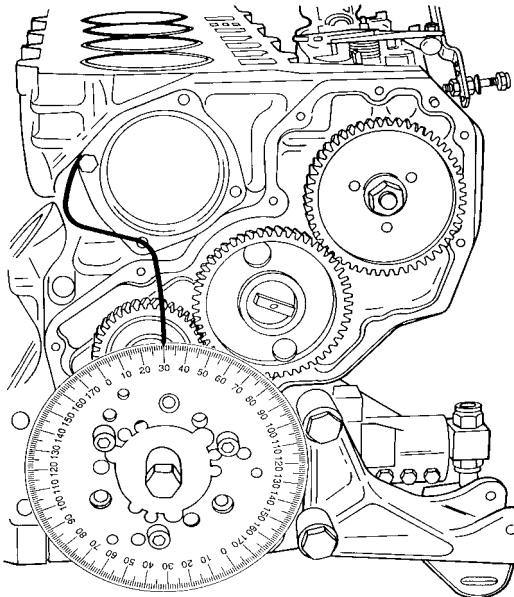
- Install graduated disc P/N 91-80133350 to crankshaft pulley.

Using a suitable gauge wire, make a pointer and attach it to a suitable location on the block. Align pointer to zero ("0") as shown.



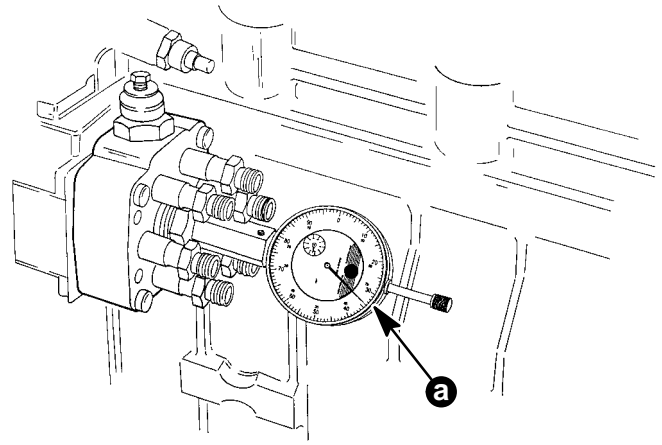
25805

- Rotate crankshaft counterclockwise to 30 degrees.



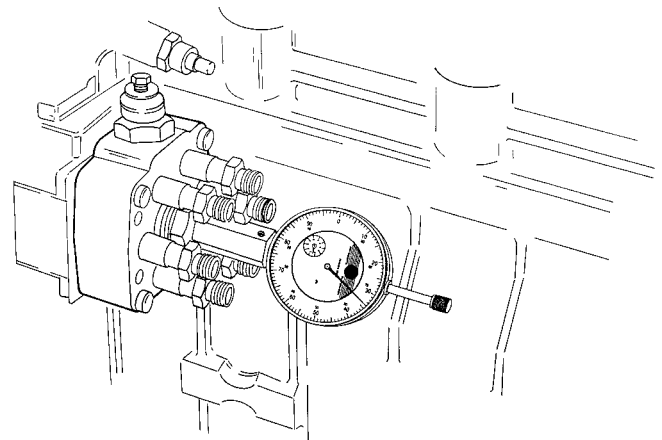
25815

- Rotate crankshaft clockwise until dial indicator just starts to move.
- Zero dial indicator as shown (c) above.
- Rotate crankshaft clockwise to align pointer with ("0") degrees on disc.
- Dial indicator should read .034 in. (.88mm) (a).



25822

- If reading is other than specified, loosen pump mounting nuts and rotate in direction needed to obtain correct specification.



25822

- Tighten injector pump, mounting nuts securely. Dial indicator reading must not change.

MerCruiser Diesel Mechanical Valve Adjustment Procedure

On the 20-50 hour break-in period it is stated the valve clearance be checked and readjusted if necessary.

To adjust the valves on a cold engine, place #1 cylinder at top dead center (TDC) and adjust both valves to specifications 0.012 in. (.30mm). Rotate the crankshaft clockwise, 60° degrees for a 6 cylinder, 72° degrees for a 5 cylinder, to the next firing cylinder to TDC and adjust both valves according. Adjust the remaining cylinders following the correct firing order.

Firing Order	6 CYL	1-5-3-6-2-4
	5 CYL	1-2-4-5-3