

Rotunda

ROTUNDA DIESEL TACH/TIMING METER MODEL 78-0116

INSTRUCTION MANUAL



ROTUNDA 78-0117

2.4L DIESEL ADAPTER
OPERATING INSTRUCTIONS

(For use with 78-0100 Diesel Tach/Timing Units)



GENERAL

The Rotunda 78-0117 Diesel Adapter is designed to verify and check engine rpm and diesel timing on 2.4L, 6-cylinder diesel engines. The adapter plugs directly into 78-0100 units, and to the engine diagnostic connector located above the injector for cylinder no. 5. With one test lead connection, the meter is able to sense the injector needle lift on cylinder no. 4 and the crankshaft reference pin position on the flywheel to display engine rpm and diesel timing measurements.

The operator instructions included with the 78-0100 diesel tach/timing meter are to be used for reference only. The magnetic probe, luminosity pickup, luminosity probe, and cetane tester are not used when testing 2.4L engines with the 78-0117 adapter. Use the test preparation and test procedure that follow.

TEST PREPARATION

1. Start the engine and allow it to reach normal operating temperature.
2. Turn off the engine.

3. Disconnect the 8-pin tripminder connector located near the air filter housing.

NOTE: If the tripminder connector is not disconnected in step 3, incorrect timing readings may result.

4. Connect the adapter to the meter.
5. Clamp the meter power leads to the battery: RED to the positive battery terminal; BLACK to the negative battery terminal.

NOTE: If the tripminder connector is disconnected after the power leads are attached to the battery, disconnect and reconnect the power leads to reset the meter.

6. Set the OFFSET on the meter to -20.4 degrees.
7. Remove the dust cover from the diagnostic connector and plug the adapter into it.

TEST PROCEDURE

1. Start the engine. Be sure the engine is at normal operating temperature.
2. Read the engine rpm and diesel timing shown on the meter.
3. Turn the engine off.
4. Compare the readings to manufacturer's specifications.
5. Remove the power leads and adapter from the engine.
6. Make adjustments per manufacturer's recommendations, if necessary. Then repeat test procedure to verify adjustment.

SAFETY PRECAUTIONS

The following precautions must always be observed when doing automotive testing:

1. To ensure safe operation and to prevent personal injury, completely read the instructions presented in this pamphlet before testing.
2. Exhaust gases contain carbon monoxide, which is a colorless and lethal gas. For this reason, always work in well ventilated areas.
3. Diesel fuel fumes are explosive. DO NOT smoke around diesel fuel.
4. Wipe up fuel spills immediately and dispose of soaked rags in air-tight containers.
5. Before testing, always check the vehicle fluid levels. DO NOT test a vehicle if the fluids are low.

NOTE: Always check the coolant level when the engine is cold to prevent injury.

6. To extend the life of the tester leads, keep them off the floor and away from moving engine parts.
7. Raise drive wheels off the ground before performing any tests with the engine running.
8. Always set the parking brake. Also, on vehicles equipped with manual transmissions, place the shift lever in neutral; on vehicles equipped with automatic transmissions, be sure the shift lever is in park.
9. When checking timing, stay clear of rotating engine parts.

CONDITION	Possible Cause	Corrective Action
1. No spark at plug or from test lead	Reversed polarity - no power to meter	Check battery connections - test leads to meter
2. No spark at plug or from test lead	Insufficient voltage	Check spark plug proper attachment
3. No spark at plug or from test lead	Insufficient voltage or a full restriction	Check for engine leakage or improperly adjusted distributor

GENERAL

The Rotunda 78-0116 Diesel Tach/Timing Meter designed to verify and check engine rpm and diesel timing on 2.4L, 6-cylinder diesel engines. Adapter P/N 78-0117, included with the meter, plugs directly into the meter and into the engine diagnostic connector located above the injector for cylinder no. 5. With one test lead connection, the meter is able to sense the injector needle lift on cylinder no. 4 and the crankshaft reference pin position on the flywheel to display engine rpm and diesel timing measurements.

TEST PREPARATION

1. Start the engine and allow it to reach normal operating temperature.
2. Turn off the engine.
3. Disconnect the 8-pin tripminder connector located near the air filter housing.

NOTE: If the tripminder connector is not disconnected in step 3, incorrect timing readings may result.

4. Connect the adapter to the meter.
5. Clamp the meter power leads to the battery: RED to the positive battery terminal; BLACK to the negative battery terminal.
6. Set the OFFSET on the meter to -20.0 degrees.
7. Remove the dust cover from the diagnostic connector and plug the adapter into it.

TEST PROCEDURE

1. Start the engine. Be sure the engine is at normal operating temperature.
2. Read the engine rpm and diesel timing shown on the meter.

3. Turn the engine off.
4. Compare the readings to manufacturer's specifications.
5. Remove the power leads and adapter from the engine.
6. Make adjustments per manufacturer's recommendations, if necessary. Then repeat test procedure to verify adjustment.

METER DIAGNOSTICS

Listed in the chart below are several conditions that will affect the operation of the meter. If any of these conditions exist, read the items that correspond to the condition in the POSSIBLE CAUSE and CORRECTIVE ACTION columns.

METER OPERATION CHECK

1. Attach the power leads to the meter to a 12 volt battery.
2. With power to the unit, the meters should read as follows:
 - a. The RPM meter should read zero.
 - b. Turn the OFFSET ANGLE adjustment knob fully clockwise. The DEGREES meter should read -170° to -190°.
3. If the meter does not respond as indicated above, contact your local Sun Service Facility.

SERVICE INFORMATION

For repair and service information, contact Sun Electric Corporation Service Center. In shipping the unit, enclose return address, name to contact, and a brief description explaining the nature of the difficulty.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Degrees and rpm meters inoperative.	Reversed polarity, no power to meter.	Check: Battery connections, battery leads to meter.
2. Degrees and/or rpm reading fluctuates.	Intermittent readout.	1. Check adapter for proper attachment. 2. Check for erratic leaking or improperly adjusted fuel injector or a fuel restriction.

REGIONAL OFFICES

Atlanta: 569 Lee Industrial Blvd., Austell, GA 30001, (404) 944-1090
Boston: 59 Manley Street, Brockton, MA 02401, (617) 584-0900
Buffalo: 9700 Main Street, Clarence, NY 14031, (716) 759-6821
Charlotte: 620 North I-85, Charlotte, NC 28216, (704) 399-5681
Chicago, S.: 7518 W. 98th Place, Bridgeview, IL 60455, (312) 430-4600 & 4601
Cincinnati: 2973 P. G. Graves Lane, Evendale, OH 45241 (513) 563-2660
Cleveland: 14411 Foltz Parkway, Strongsville, OH 44136, (216) 238-6037
Dallas: 735 109th St., Arlington, TX 76011 (817) 461-0044
Denver: 4905 East 41st St., Denver CO 80216, (303) 355-1691
Detroit: 34153 Industrial Road, Livonia, MI 48150, (313) 522-8383
Houston: 1702 Townhurst Drive, Houston, TX 77043 (713) 465-4477
Kansas City: 1510 East Spruce, Olathe, KS 66061 (913) 782-0300
Los Angeles: 16658 Armintha St., Van Nuys, CA 91406, (213) 782-0459
Miami: 1015 NW. 6th St., Deerfield Beach, FL 33441, (305) 428-5151
Milwaukee: 665 Larry Court, Waukesha, WI 53186 (414) 786-8630
Minneapolis: 14850 Martin Dr., Eden Prairie, MN 55344, (612) 937-1505 & 1506
Nashville: 1854 Airplane Drive #20, Nashville, TN 37210 (615) 885-1972
New Orleans: 5135 Storey Street, Harahan, LA 70123, (504) 733-1424
New York City: 3180 Expressway Dr. South, Central Islip, NY 11722, (516) 234-9181
Omaha: 4320 S. 102nd Street, Omaha, NE 68127, (402) 331-5061
Philadelphia: 2520 Wyandotte Road, Willow Grove, PA 19090, (215) 659-7780
Phoenix: 3821 North 34th Ave., Phoenix, AZ 85017, (602) 278-5514
Pittsburgh: 270 Alpha Drive, Pittsburgh, PA 15238, (412) 963-7770
St. Louis: 515 Rudder Road, Fenton, MO 63026 (314) 343-5011
San Jose: 2040 Hartog Drive, San Jose, CA 95131, (408) 263-4200
Seattle: 14328 Linden Ave., N., Seattle, WA 98133, (206) 365-9000
Washington, D. C.: 5024 Herzel Place, Beltsville, MD 20705, (301) 937-3510, 3511 & 3512

LIMITED ONE (1) YEAR WARRANTY

Sun Electric Corporation, **One Sun Parkway, Crystal Lake, Illinois**, warrants to the first user that each new piece of equipment shall be free from defects in material and workmanship for a period of one year after purchase and delivery. However, all leads and probes, and all external hoses other than exhaust gas hoses, are warranted to the first user for ninety days. Filter elements are not warranted hereunder.

All collision repair equipment is covered by the one year warranty with the exception of hydraulics, including pumps and rams, which carry a six (6) month warranty.

The above warranty does not apply to damage caused by accidents; alterations; tampering; or improper or unreasonable use; or failure to provide reasonable and necessary maintenance, including filter element replacement.

Your exclusive remedy under any express or implied warranty pertaining to any product shall be the repair or replacement, at Sun Electric Corporation's option, of any defective part or parts which shall have been returned to Sun Electric Corporation all transportation charges prepaid. SUN ELECTRIC CORPORATION SHALL NOT BE LIABLE UNDER ANY EXPRESS OR IMPLIED WARRANTY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.

NO IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, PERTAINING TO ANY PRODUCT SHALL EXCEED IN DURATION THE ABOVE EXPRESS WARRANTY APPLICABLE TO SUCH PRODUCT. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Sun Electric Corporation does not authorize other persons to assume any liability in connection with the sale of its products. Sun Electric Corporation reserves the right to make changes in the design of any product at any time without obligation for retroactive action.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Depress clutch pedal while in forward gear	Excessive clutch pedal travel	Check clutch cable adjustment
2. Depress clutch pedal while in reverse gear	Clutch pedal travel	Check clutch cable adjustment

LIMITED ONE (1) YEAR WARRANTY

Sun Electric Corporation, One Sun Parkway, Crystal Lake, Illinois, warrants to the first user that each new piece of equipment shall be free from defects in materials and workmanship for a period of one year after purchase and delivery. However, all tools and other accessories shall be warranted for a shorter period as warranted hereunder.

All obligations of Sun Electric Corporation under this one year warranty shall be subject to the receipt of the product, including stamps and forms, within 15 days after the date of purchase.

This one year warranty does not extend to damage caused by accidents, alterations, tampering, or improper use. Sun Electric Corporation reserves the right to provide diagnostic and necessary maintenance, including the current replacement.

Four (4) years' limited warranty on any defects in material or workmanship on any products. In the event of replacement of Sun Electric Corporation's control of any defective part or part which shall have been returned to Sun Electric Corporation at the time of purchase, SUN ELECTRIC CORPORATION SHALL NOT BE LIABLE UNDER ANY EXPRESS OR IMPLIED WARRANTY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

NO IMPLIED WARRANTIES INCLUDING BUT NOT LIMITED TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY TO ANY PRODUCTS MANUFACTURED BY SUN ELECTRIC CORPORATION. THE ONLY WARRANTY APPLICABLE TO OUR PRODUCTS IS THE ONE SET FORTH IN THIS WARRANTY.

Sun Electric Corporation does not warrant the life of any product. The right to repair or replace any product is subject to the availability of parts and the right to repair or replace any product is subject to the availability of parts.