

NUMBER: 82-7

DATE: 5-5-82

CIRCULATE TO:  
SERVICE MANAGER  
PARTS MANAGER  
MECHANICS

- A. Timing/Synchronizing/Adjusting 300 HP Model
- B. Service Tools Required for Repair of 300 HP Model

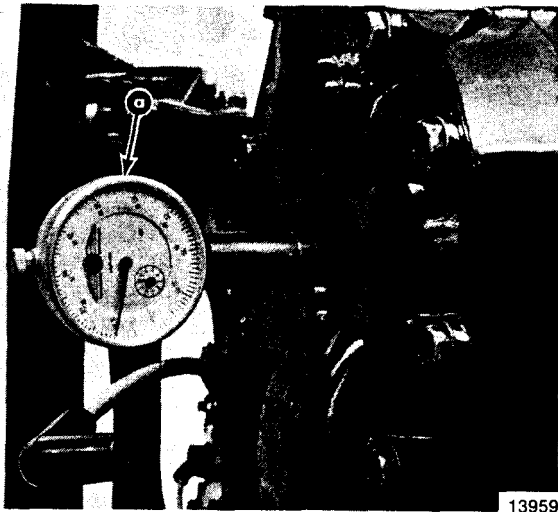
## A. TIMING/SYNCHRONIZING/ADJUSTING 300 HP MODEL

Firing Order	1-2-3-4-5-6
Firing Sequence	60" Consecutive
Spark Plug	NGK BUHW
Spark Plug Gap	Not Adjustable
Timing Maximum	20" BTDC (22" at Cranking)
Throttle Primary Pickup	13° ATDC
Throttle Secondary Pickup	Not Adjustable
Full Throttle RPM	5300-5800
Idle RPM (in Forward Gear)	550-600 (13° ATDC)

### Timing Pointer Adjustment

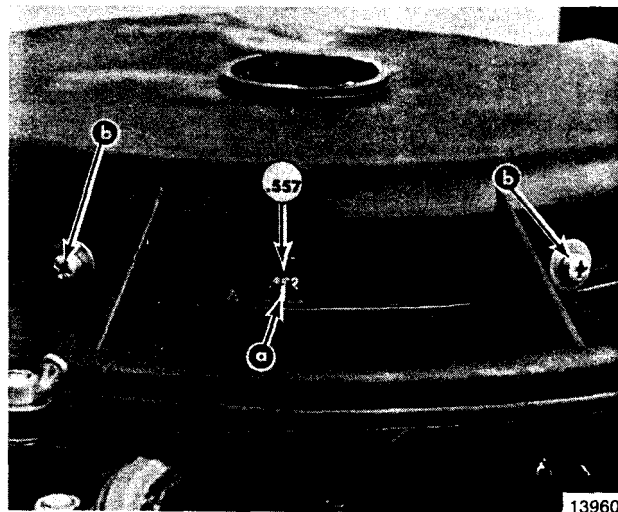
**SAFETY WARNING:** Engine could start when turning flywheel to check timing pointer adjustment. Remove all spark plugs from engine to prevent engine from starting.

1. Remove all spark plugs and install Dial Indicator (C-91-58222A1) (Figure 1) into No. 1 cylinder (top cylinder, starboard bank).
2. Turn flywheel in a clockwise direction until No. 1 piston is at top dead center (TDC). Set dial indicator at "0" (zero) and tighten indicator set screw.
3. Turn flywheel counterclockwise until dial indicator needle is approximately 1/2-turn beyond .557" mark, then turn flywheel clockwise so that dial indicator reads .557" exactly.
4. Reposition timing pointer (if necessary) so that timing pointer is aligned with .557 mark on flywheel, as shown in Figure 2. Retighten pointer attaching screws.
5. Remove dial indicator from cylinder and reinstall No. 1 spark plug and spark plug lead.



a - Dial Indicator Installed in No. 1 Cylinder

Figure 1. Dial Indicator Installed into Cylinder



a - Timing Pointer; Align with .557 Mark

b - Timing Pointer Attaching Screws

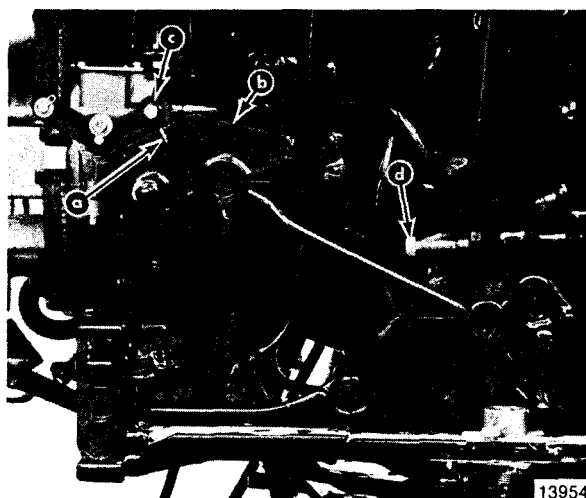
Figure 2. Timing Pointer Alignment

### Timing Adjustments

**IMPORTANT:** If link rod was disassembled, make sure that 11/16" (17.5mm) dimension is retained, as shown in Figure 6.

**CAUTION:** Engine is timed while cranking engine over with starter motor. To prevent engine from starting when being cranked, all spark plugs must be removed, except No. 1 plug.

1. Remove all spark plugs, except **No. 1** spark plug (top cylinder, starboard bank), from engine.
2. Disconnect remote fuel line from engine.
3. Connect electrical harness to engine.
4. Remove throttle cable barrel from barrel retainer on engine.
5. Adjust idle stop screw (Figure 3) so that slash mark on throttle cam is at the point of contact with roller, as shown in Figure 3. Retighten nut on idle adjustment screw.



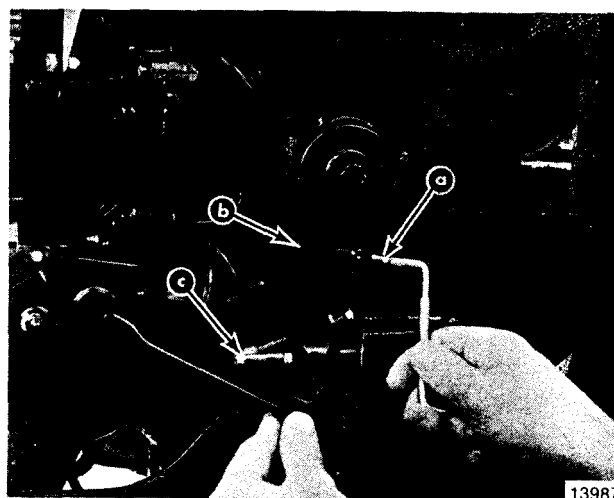
a - Slash Mark

b - Throttle Cam

c - Roller

d - Idle Stop Screw (Adjust so that Slash Mark Is at Point of Contact with Roller)

Figure 3. Idle Stop Screw Adjustment



a - Primary Pickup Screw

b - Throttle Lever

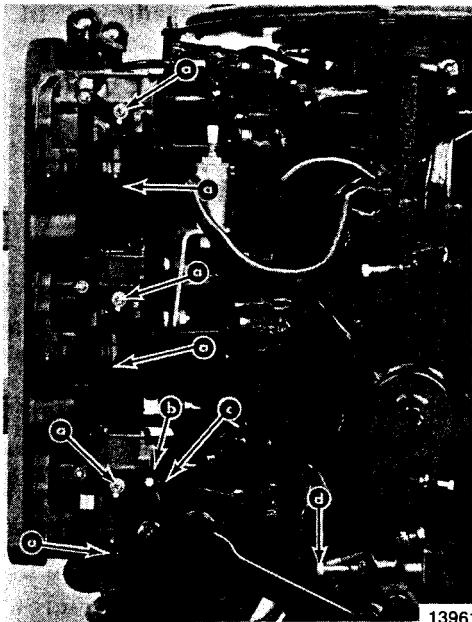
c - Idle Stop Screw (Position against Stop when Adjusting Primary Pickup)

Figure 4. Throttle Primary Pickup Adjustment

6. Connect timing light to No. 1 spark plug (top starboard bank).

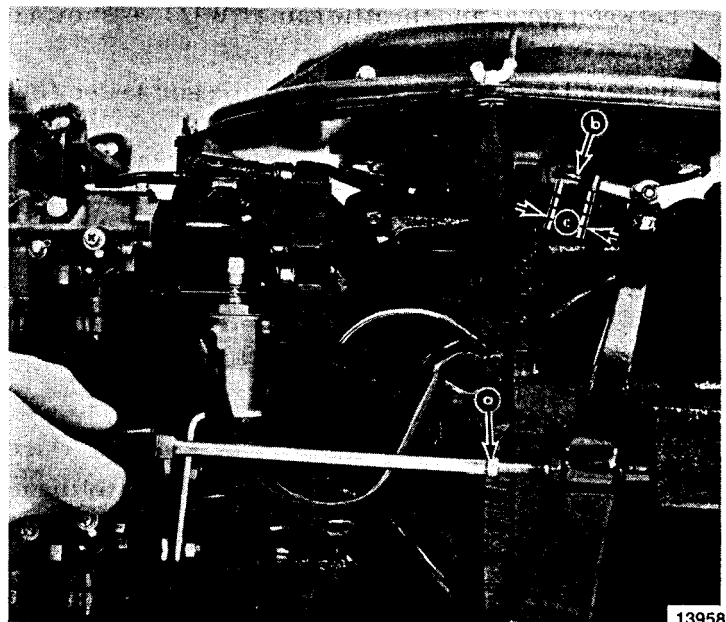
**SAFETY WARNING: Before cranking engine, keep clear of propeller, as it may rotate.**

7. With engine in neutral, hold throttle lever so that idle stop screw is against stop (Figure 4), then crank engine with starter motor and adjust throttle primary pickup screw (Figure 4) to align specified throttle primary pickup mark on flywheel with timing pointer. Retighten nut on adjustment screw.
8. Synchronize carburetors as follows:
  - a. Remove 2 bolts and remove fuel line connector from mount, then remove sound box cover from engine. This is necessary to be sure that all carburetor throttle shutters are closed and that they open together.
  - b. Loosen carburetor synchronizing screws (Figure 5) and allow all throttle shutters to close completely.
  - c. Position throttle lever so that idle stop screw is against stop. Move roller arm until roller (Figure 5) just touches throttle cam. Without moving roller from this position, retighten carburetor synchronizing screws.
  - d. Look into carburetor bores and check that all carburetor shutter plates close completely and open exactly at the same time when throttle lever is actuated.



a - Synchronizing Screws  
b - Roller  
c - Just Touching  
d - Idle Stop Screw (against Stop)

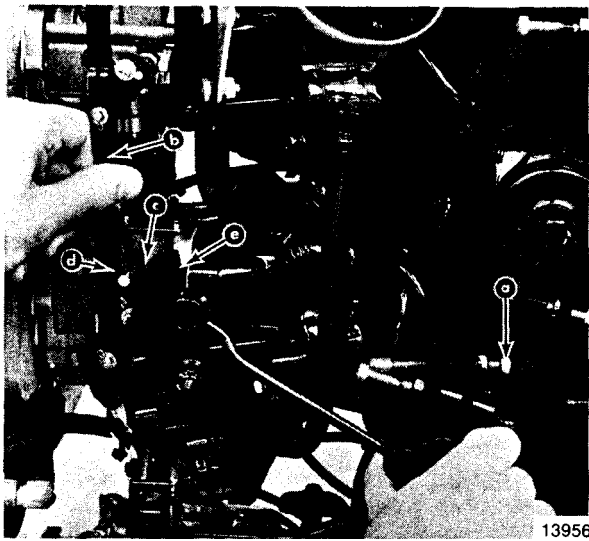
**Figure 5. Carburetor Synchronizing**



a - Maximum Spark Advance Screw  
b - Link Rod  
c - 11/16" (17.5mm); Make Sure that This Dimension Is Retained if Link Rod Was Disassembled

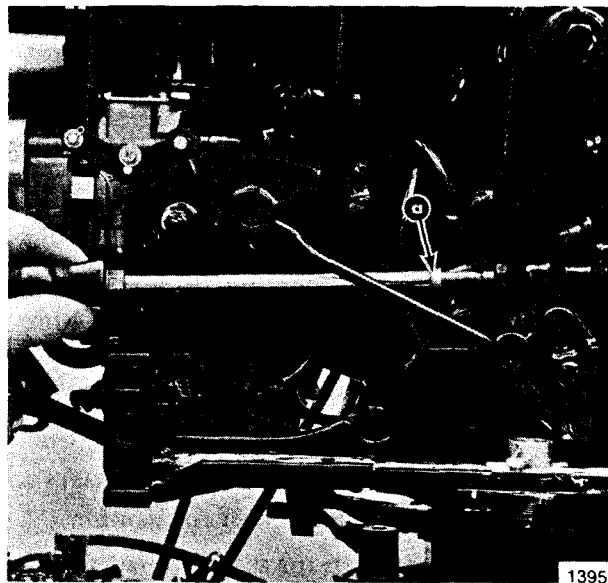
**Figure 6. Maximum Spark Advance Adjustment**

9. With engine in neutral, move throttle lever to place maximum spark advance screw against stop. Crank engine with starter motor and adjust maximum spark advance screw (Figure 6) to align 22° mark on flywheel with timing pointer. Due to the spark advance characteristics of this ignition system, this adjustment will result in a spark advance of 20° BTDC at 5500 RPM.



- a - Full Throttle Stop Screw
- b - Push Throttle Linkage Downward
- c - .010" to .015" (0.25mm to 0.38mm) Clearance
- d - Roller      e - Throttle Cam

**Figure 7. Full Throttle Stop Adjustment**



- a - Idle Stop Screw

**Figure 8. Idle RPM Adjustment**

10. With engine not running, move throttle lever to wide-open-throttle (WOT) and adjust full throttle stop screw (Figure 7) to allow full throttle opening at WOT. Make sure that throttle shutters do not act as a throttle stop. Allow .010" - .015" (0.25mm to 0.38mm) clearance between roller and throttle cam at WOT, as shown in Figure 7. Retighten nut on adjustment screw.
11. Reinstall sound box cover to engine and fasten fuel line connector to sound box.
12. Adjust engine idle RPM, as follows:

**CAUTION: Engine idle RPM must NEVER exceed 750 RPM in gear.**

- a. With engine in water, connect electrical harness and fuel line to engine. Start engine and allow to warm up.
- b. With throttle cable barrel removed from barrel retainer, adjust idle RPM to specified idle **RPM** with engine running in forward gear. (Figure 8) Retighten nut on adjustment screw.
- c. With end of throttle cable connected to throttle lever, hold throttle lever against idle stop. Adjust throttle cable barrel to slip into barrel retainer on cable anchor bracket with a very light preload of throttle lever against idle stop. Lock barrel in place.
- d. check preload on throttle cable by placing a thin piece of paper between idle stop screw and idle stop. Preload is correct when paper can be removed without tearing but has some drag on it. If necessary, readjust cable barrel.

**IMPORTANT: Excessive preload on throttle cable will cause difficulty when shifting from forward to neutral. If necessary, readjust throttle cable barrel.**

## B. SERVICE TOOLS REQUIRED FOR REPAIR of 300 HP MODEL

The tools listed below are special service tools required for repair of the Merc V300 Outboard. Those tools marked (\*) are new and can be ordered through your Distribution Center.

### Powerhead Tools

91-52344	Flywheel Holder
91-73687A1	Flywheel Puller
91-90455	Lifting Eye
*91-92973A1	Piston Pin Installer
"91-93004A1	Lock Ring Installer

### Lower Unit Tools

91-31108	Oil Seal Driver
91-31229A5	Bearing Removal and Installing Kit
91-52915A3	Trim Cylinder Tester Kit
91-52915A5	Trim Cylinder Test
91-61069	Gear Housing Cover Tool
91-89897	Dial Indicator Holder
*91-92785A1	Dial Indicator Clamp
*17-92786	Pin, Water Pump Location
91-92787	Tilt Lever Bushing Tool
*91-92788	Pinion Bearing Installation
*91-92789	Pinion Bearing Driver
*91-92790	Pinion Location Plate
*91-93227	Driveshaft Bearing Wrench

### Ignition and Electrical Testing

76675A1	Reference Electrode
91-35507A2	Timing Light
91-52024A1	Remote Starter Switch
91-58222A1	Dial Indicator
91-59339	Tachometer and Dwell Meter
91-63998A1	Spark Gap Tester
91-76032	Magneto Analyzer
91-89045	Direct Voltage Adaptor
91-93572	VOA Meter
91-94089A1	Tachometer Tester

### Miscellaneous

91-34569A1	Slide Hammer Puller
91-37241	Universal Puller Plate
91-46086A1	Bearing Puller Jaws