



MOTION PRO, INC. 867 AMERICAN STREET, SAN CARLOS, CA. 94070
PH. (650) 594-9600 E-Mail: mpinfo@motionpro.com FAX (650) 594-9610

INSTRUCTIONS FOR USING THE MOTION PRO #08-0010 MERCURY CARBURETOR SYNCHRONIZER

WARNING!

Mercury is a cumulative poison that is absorbed through the lungs, skin and digestive tract. Do not inhale vapors, let it touch your bare skin or ingest. Do not reuse the mercury container for any other purpose. Dispose of in accordance with Federal, State and Local regulations.

CAUTION!

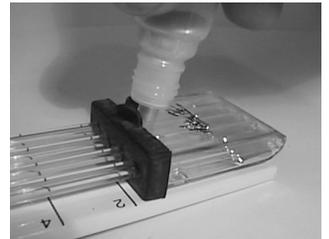
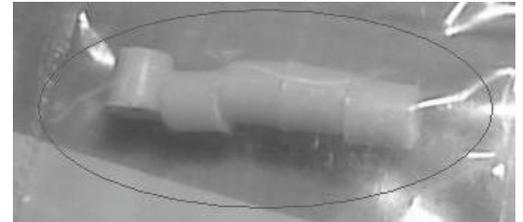
Engine speeds exceeding 3,500 RPM and/or rapid throttle closure can cause mercury to be sucked into the engine. If this occurs, follow these safety procedures to avoid acute mercury exposure.

1. Remove all personnel from the area. Do not inhale exhaust fumes or vapors.
2. Do not allow anyone to return to the exposed area until all fumes and vapors have dissipated.
3. Always use this tool in a well-ventilated area with plenty of fresh air. Use an exhaust collector or ventilation fan whenever possible.

To purge the mercury from the engine, ride the motorcycle one mile or more, or run the motor outdoors for approximately 3-5 minutes. No damage will occur to the engine if this procedure is followed. Use a fan to cool the engine while synchronizing carburetors. Replacement Mercury is available under part number 08-0012.

ASSEMBLY:

1. Cut the long piece of hose into four equal lengths. Then install a line restrictor in one end of each hose. It does not matter which way the restrictors are installed as long as all four small holes are in the same direction. Use a small pin punch to push the restrictors into each hose about 3/4". Install the hose ends with restrictors onto the clear tubes.
2. Place the synchronizer body face up on a clean flat surface. Elevate the top of the synchronizer body about 1 inch; this will prevent mercury from spilling out the top of the tubes. Fill the mercury reservoir through the vent hole in the face of the reservoir (use the full contents of bottle supplied). Close the vent and stand the tool upright.



USE:

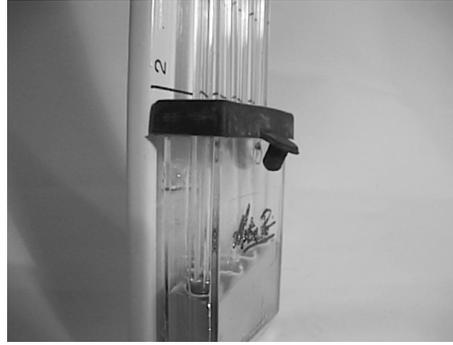
1. Always use in the upright position. The left handle bar end is usually a convenient location to hang the synchronizer.
2. Bring the engine to its normal operating temperature.
3. Remove the fuel tank. Use Motion Pro's Auxiliary Tank (#08-0032 or 08-0189) while synchronizing carburetors.
4. Remove the carburetor covers (if needed), so that all carburetor synchronizing adjusting screws are accessible.
5. Attach the vacuum hoses to each corresponding intake manifold (#1 hose to #1 cylinder, #2 hose to #2 cylinder, etc.). Use intake manifold adapters on models that require them. Most Honda and Suzuki models use 5mm adapters, while most Yamaha models use 6mm adapters. Some Kawasaki models have spigots molded into the intake manifolds.
6. Open the vent on the face of the reservoir.
7. At idle; adjust all the carburetors so that the mercury columns register the same. Motion pro offers several tools for carb adjustments. See them at www.motionpro.com. If synchronization can not be achieved, other problems exist. Some possibilities are low compression, intake manifold leaks, dirty air filters, worn carburetor bodies or throttle slides or possibly a restricted exhaust system.
8. Disconnect the synchronizer and remove the manifold adapters (if applicable). Close the vent. Replace any plugs, caps or hoses that were removed. Reinstall the fuel tank.

STORAGE: Close the vent plug on the front of the reservoir and store in an upright position.

TIP: Troubleshooting guides are available in manuals from Clymer Publications for your specific model.



Normal Mercury Level



Vent in Open Position



Vent in Closed Position

FAQs:

Q: Gaps have formed in the mercury columns. What can I do to correct and prevent this?

A: It is likely that condensate (fuel and/or water) has formed and has partially mixed with the mercury. Using a syringe without a needle (or other small volume manual air pump) force air through each hose until air bubbles are gently forced into the reservoir. This forces the condensate into the reservoir where it will float on the surface of the mercury. The condensate does not weigh much compared to mercury so if you are unable to remove it the error caused is negligible as long as approximately equal amounts are in each channel (tube).

The fuel segment of condensate can be kept to a minimum by either warming the engine up to operating temp prior to connecting the manometer (carb synchronizer), or by pinching off the vacuum lines with plastic hemostats (available from tool trucks) for that purpose until operating temperature is reached. Water condensate is unavoidable due to the "atmospheric" conditions present in the intake tract at idle.

Another reason for gaps in the mercury column is because the reservoir is low. The tool should not be used until the reservoir is refilled to the correct level. Continued use will result in the remainder of the mercury being ingested by the engine. Once the reservoir has been depleted enough to allow air to be drawn into any tube from the bottom, the engine will have sufficient vacuum to draw the remainder of the mercury into the intake tract(s).

Q: What do the numbers on the scale represent?

A: The height of mercury in centimeters, this is the metric standard for vacuum values (cm/Hg, Hg = mercury). It represents the height in centimeters that the vacuum can draw the mercury up the tube against gravity with atmospheric pressure pushing against the surface of the mercury in the reservoir. Conversions for various vacuum values are 30 in/Hg = 76.2cm/Hg = 14.7psi. Most four stroke engines will show a value between 20 and 50 cm/Hg at idle.

Q: My shop manual gives a specific value or range that the vacuum should be at. Do I adjust the carbs to this value?

A: While some manufacturers specify a normal value for the vacuum at idle, with very few exceptions the purpose of synchronization is to adjust all intake tracts to equal values in order to achieve a smooth idle. If your engine does not fall within the specified range when all cylinders are equal, it indicates there is probably a problem elsewhere in the engine or carburetion that needs to be investigated. The exception to equal vacuum values at idle occurs when the intake tracts are not of equal length and the manufacturer has specified a specific differential between cylinders to account for the difference in the intake tracts.

Q: Will the synchronizer work on outboard motors and snowmobiles?

A: It will work on multi cylinder **four stroke** engines. It should not be used for any two stroke applications.

Q: Do I need to synchronize my Fuel Injected engine?

A: Virtually all **four stroke** fuel injected applications with multiple throttle bodies require synchronization. Check the service manual to verify whether your engine needs this service and how to make the adjustments.

First Aid Measures for Metallic Mercury

Metallic mercury gives off odorless, colorless, tasteless, poisonous vapor at room temperature. Toxic vapor increases when heated. Use with adequate ventilation. Avoid skin contact; wear rubber gloves and protective clothing. Metallic mercury can be acute or chronic poison. If swallowed, do **NOT** induce vomiting, consult physician immediately.

Accidental Metallic Mercury Spills

The following precautions should be taken if a **small** mercury spill occurs:

- People not involved in the cleanup should leave the area.
- Minimize tracking by removing shoes and clothing. Assume that the clothes of anyone who handled the mercury are contaminated. Place clothes in a sealed plastic bag and disposed of in accordance with Federal, State and Local regulations. Plastic can be placed on the floors to minimize tracking.
- Do **NOT** use a vacuum cleaner to clean up the spill. A vacuum cleaner will spread the mercury vapors and tiny droplets will settle throughout the area, increasing the spread of contamination and the chance of exposure.
- Windows and doors in the area of the spill should be opened to ventilate the area.
- Small amounts of mercury can be collected with adhesive tape or an eye dropper and stored in a sealed plastic container until disposal.
- After all visible mercury has been collected, use a mercury cleanup kit to clean the spill area and work it into the cracks with a broom or brush. Do not add water. Materials in the mercury spill kit will rapidly bind to the remaining mercury and can be swept up with a broom and dustpan. Wash the area with trisodium phosphate detergent solution and rinse with water.
- Contaminated carpeting should be removed and disposed of in accordance with Federal, State and Local regulations.
- Contaminated materials and mercury collected from small spills should be removed and disposed of in accordance with Federal, State and Local regulations.