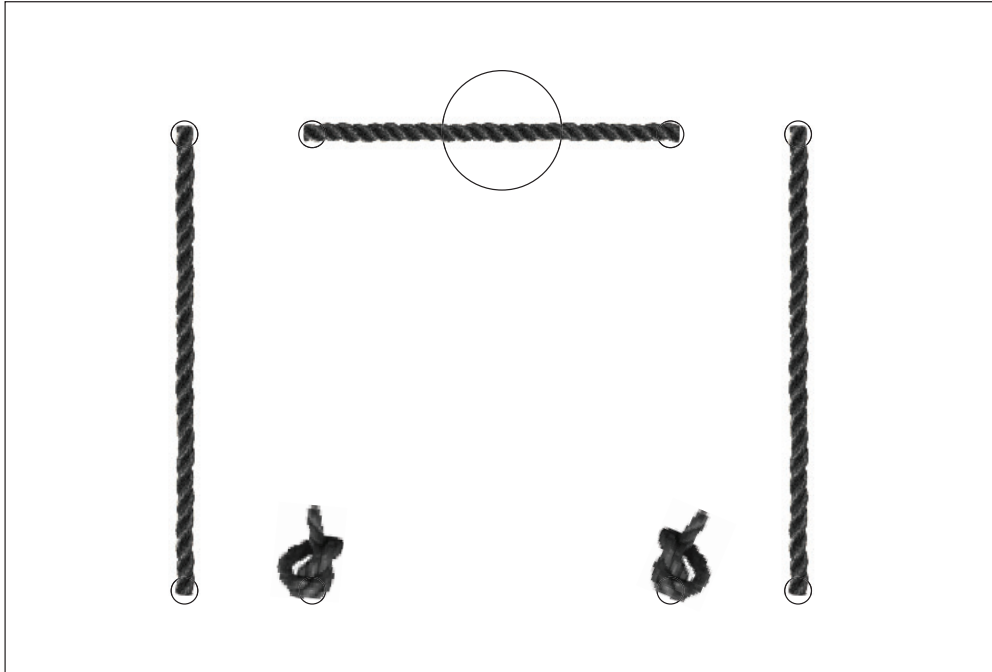


# PRODUCT #13535 INSTRUCTION SHEET

Your #13535 Carb Synchronizer Kit comes with a gauge mounting board. To mount gauges simply thread small bungee supplied through board as shown in photo below. The knots at ends as shown.



Turn board over and lift bungee to slide gauges into place. See Photo Below.



## FUEL SYSTEM

### CARBURETOR SYNCHRONIZATION

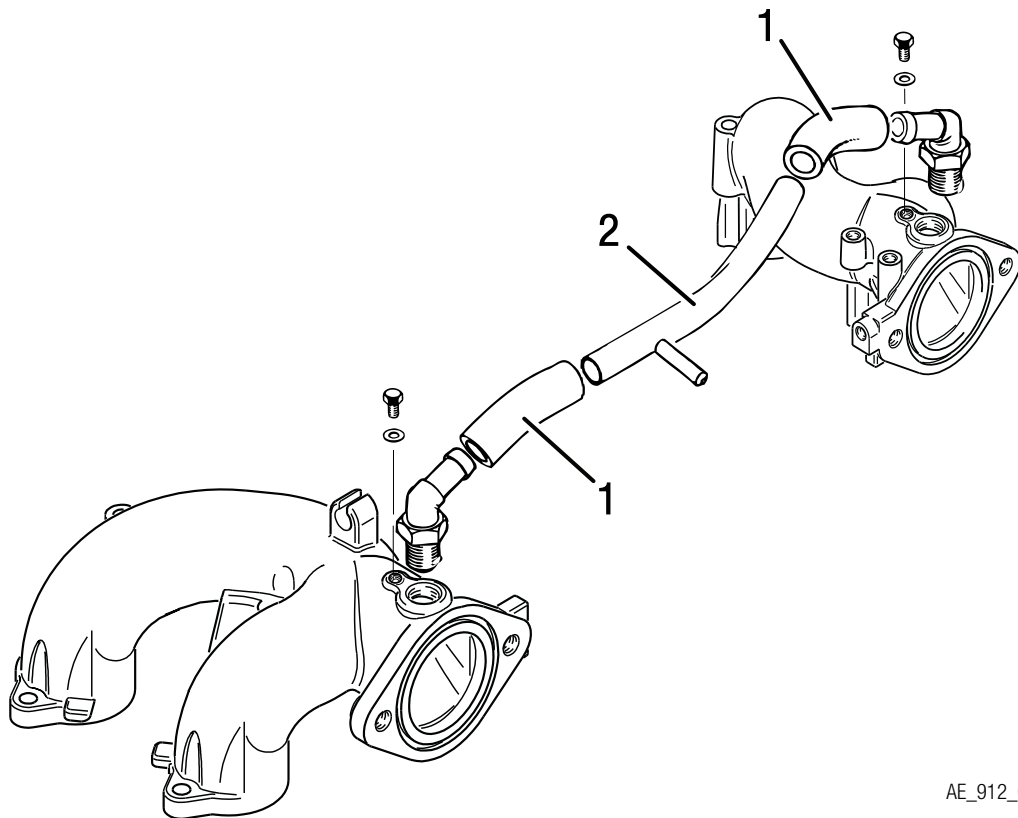
**Idle speed**      **Checking the synchronization at idle speed**  
For smooth idling, synchronization of the throttle valves is necessary. When synchronizing, slacken both bowden cables (throttle lever lies close on the adjustment screw).

**Instruction**      To synchronize when idling the following steps are necessary.

Step	Procedure
1	Detach the resonator hose of the compensating tube to separate the two air intake systems. In this condition, a slight difference in the engine running should be noticeable.

#### NOTE

*First carry out the mechanical synchronization and then the pneumatic synchronization (if required).*



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Figure 7.15: Synchronization at idle speed

1 Resonator hose

2 Compensating tube

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## MECHANICAL SYNCHRONIZATION

### General note

**⚠ WARNING**

**Non-compliance can result in serious injuries or death!**  
Always observe the engine from a safe place while it is running. Check that the cockpit is occupied by a competent operator.

### Basic throttle adjustment

For synchronous basic throttle adjustment proceed as follows.

Step	Procedure
1	Remove cable fixation (4) on throttle lever (1).
2	Return the throttle lever (1) to its idle stop position (3) by hand. There should be no resistance during this procedure.
3	Unscrew idle speed adjustment screw (2) until it is free of the stop.
4	Insert a 0.1 mm (0.004 in.) feeler gauge (gap X) between the idle speed adjustment screw (2) and the carburetor idle stop (3), then gently turn the idle screw clockwise until contact is made with the 0.1 mm (0.004 in.) feeler gauge.
5	Pull out the feeler gauge and then turn each idle speed adjustment screw (2) 1.5 turns clockwise.
6	Gently turn each idle mixture screw (6) (clockwise) until it is fully inserted and then reopen by 1.5 turns counter clockwise.
7	Check that the throttle valve opens fully automatically.
8	Adjust the two bowden cables for simultaneous opening of the throttle valves.

Carry out the above procedure on both carburetors.

### Synchronization

You must at this point place the throttle lever in the cockpit to the idle stop position. It is an advantage at this point to enlist the help of an assistant to ensure that the throttle lever remains in this position during the next steps of the synchronization process.

Step	Procedure
1	As soon as the throttle lever in the cockpit remains in the idle stop position, check the throttle valve lever to the carburetor idle stop position.
2	Using the cable fixation, secure the bowden cable accordingly.
3	As soon as the two carburetor bowden cables are installed (throttle lever in cockpit in idle position), you must check that the idle speed adjustment screw rests fully on the idle stop without pressure.

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**ATTENTION**

**An idle speed which is too low can result in gearbox wear, and if the idle speed is too high, the engine is harder to start.**

Step	Procedure
4	Start the engine and verify the idle speed. If the idle speed is too high or too low, adjust accordingly with idle speed adjustment screw.
5	Check the true running of the engine. If necessary, adjust with the idle mixture screw.

Carry out the above procedure on both carburetors.

Figure 7.16: Mechanical synchronization

- |                               |                             |
|-------------------------------|-----------------------------|
| 1 <i>Throttle valve lever</i> | 2 <i>Adjustment screw</i>   |
| 3 <i>Idle stop position</i>   | 4 <i>Cable fixation</i>     |
| 5 <i>Return spring</i>        | 6 <i>Idle mixture screw</i> |
| 7 <i>Idle adjustment</i>      | 8 <i>Plug screw M3.5x5</i>  |

## PNEUMATIC SYNCHRONIZATION

### General note

**⚠ WARNING**

**Non-compliance can result in serious injuries or death!**

Always observe the engine from a safe place while it is running. Check that the cockpit is occupied by a competent operator.

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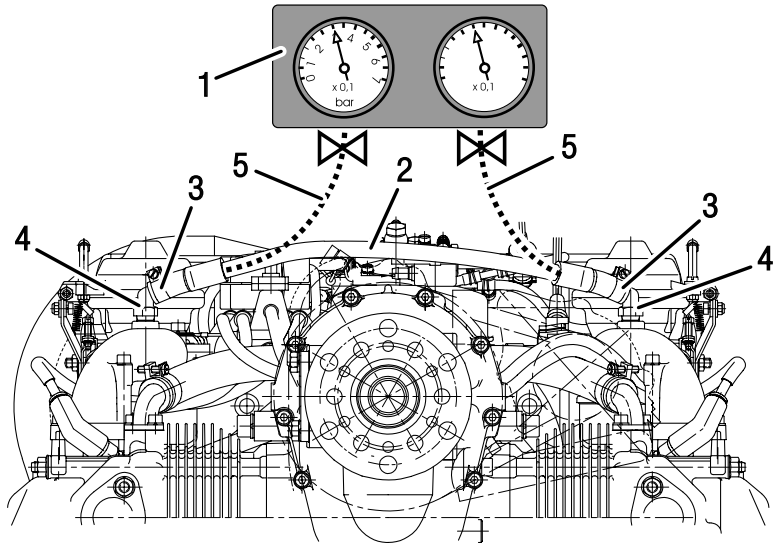
## NOTE

*Perform a mechanical synchronization before attempting a pneumatic synchronization.*

**Special tool** The two carburetors are adjusted to equal flow rate at idling with a suitable flow meter or vacuum gauge(s).

**Connection** Possible connection methods.

Option 1	
Step	Procedure
1	Remove the compensating tube (2) from the push on angular tube (4) after removing the two clamps.
2	Using the push on angular tube (4) and compensating tube (2) install a flexible rubber hose (5) leading to the vacuum gauge (1).



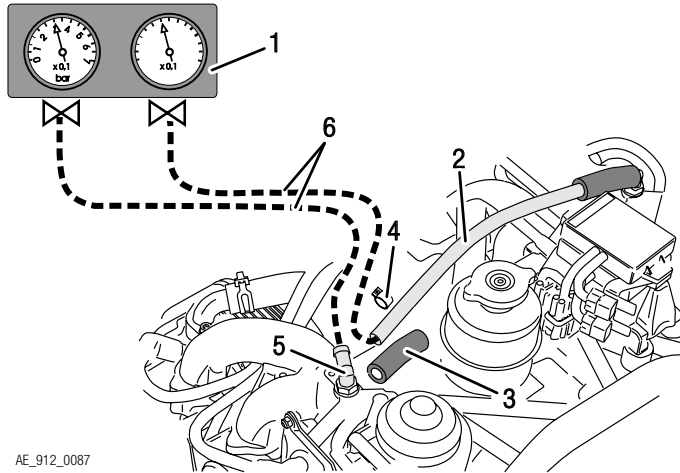
AE\_912\_0085

Figure 7.17: Option 1

- |                |                     |
|----------------|---------------------|
| 1 Vacuum gauge | 2 Compensating tube |
| 3 Clamp        | 4 Angular tube      |
| 5 Rubber hose  |                     |

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<b>Option 2</b>	
<b>Step</b>	<b>Procedure</b>
1	Remove one end of the compensating tube (2) and tube from the push on angular tube (5) after removing the two tension clamp (4).
2	Using the push on angular tube (5) and compensating tube (2) install a flexible rubber hose (6) leading to the vacuum gauge (1).



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Figure 7.18: Option 2

- |                |                     |
|----------------|---------------------|
| 1 Vacuum gauge | 2 Compensating tube |
| 3 Tube         | 4 Clamp             |
| 5 Angular tube | 6 Rubber hose       |

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Option 3	
Step	Procedure
1	Remove hex. screw M6x6 from intake manifold and connect the vacuum gauge.
2	Remove the compensation hose with attached resonator hose (connection between intake manifolds) and plug the fittings in the intake manifolds.
3	After synchronization, tighten the screw M6x6 with LOCTITE 243.

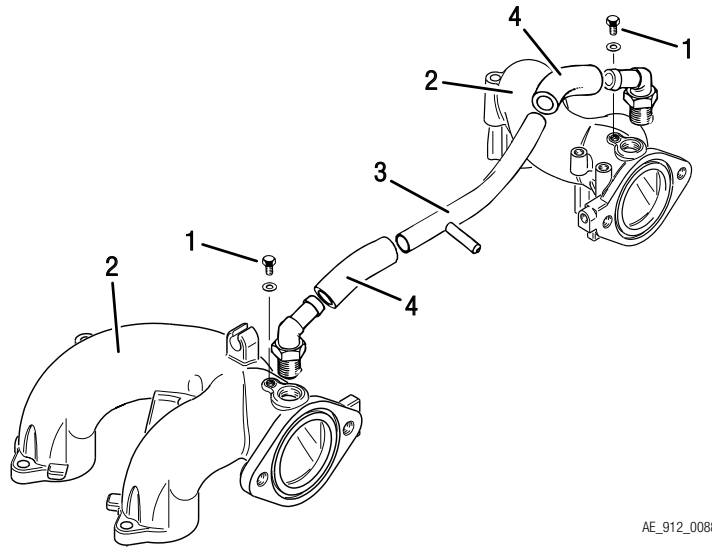


Figure 7.19: Option 3

- |                     |                   |
|---------------------|-------------------|
| 1 Hex. screw M6x6   | 2 Intake manifold |
| 3 Compensation tube | 4 Resonator hose  |

Option 4	
Step	Procedure
1	Install the vacuum gauge.
2	Clamp tube (2) with clamping pliers (1). on the cylinder 1/3 side. The compensation tube (3) does not have to be removed.
3	Remove the screw (4).
4	Install the hose nipple M6 (5) with sealing ring (6).
5	After synchronization tighten the screw M6x6 with LOCTITE 243.

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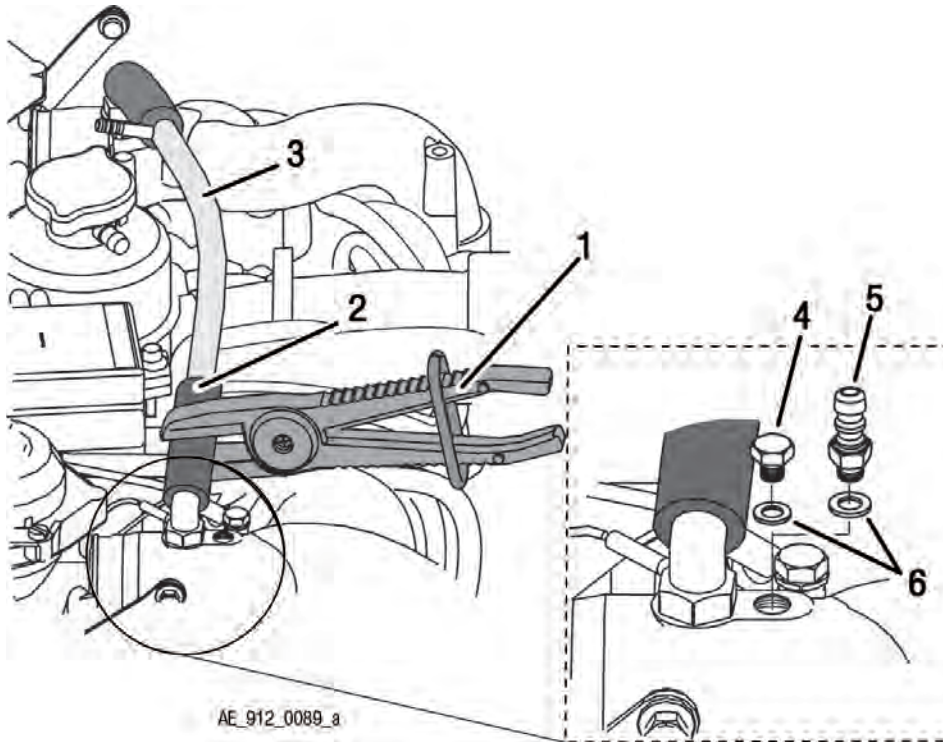


Figure 7.20: Option 4

- |   |                   |   |                         |
|---|-------------------|---|-------------------------|
| 1 | Clamping pliers   | 2 | Hose, Cylinder 1/3 side |
| 3 | Compensation tube | 4 | Screw                   |
| 5 | Hose nipple       | 6 | Sealing ring            |

## IDLE SPEED CHECK

**General note** Before proceeding, secure the aircraft on the ground using wheel chocks and ropes.

**⚠ WARNING**

**Non-compliance can result in serious injuries or death!**  
Secure the propeller region before test run watch it. Secure a safe area around propeller during test run.

Start the engine and verify the idle speed. If necessary correct as per Chapter 12–20–00 section Idle speed adjustment

**Setting of more than 1/2 turn**

If a setting of more than 1/2 turn is required, repeat mechanical synchronization to prevent too high a load on the idle stops. If the idle speed is too high, the maximum the idle screw can be unscrewed is complete turn.



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## MAINTENANCE MANUAL LINE

**No satisfactory result**

If an unsatisfactory result is achieved, inspect the idle jets for contamination and clean if necessary.

**ATTENTION**

**Also check for translucent, jelly-like contamination. Inspect for free passage.**

### OPERATING RANGE CHECK

**General note**

Once the proper idling speed has been established, it is necessary to check the operating range above the idle speed.  
 First establish that the engine is developing full take-off performance or take-off rpm when selected in the cockpit. Then the setting of the operating range (idle to full throttle) can be checked or adjusted.

**Procedure**

To control the operating range above idling the following steps are necessary.

Step	Procedure										
1	Start and warm up engine (See Operators Manual). Select full power and check that both pressure gauges are registering the same readings. If the same reading is not made on both gauges. <table border="1" style="width: 100%; margin-top: 10px; border-collapse: collapse;"> <thead> <tr style="background-color: #D3D3D3;"> <th style="width: 10%;">Step</th> <th>Procedure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Shut down the engine.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Check that carburetor actuation effects full travel and that starting carburetors (choke) are in the full off position.</td> </tr> <tr> <td style="text-align: center;">3</td> <td>If necessary, fit/modify the carburetor actuation as required to achieve full power on both carburetors.</td> </tr> </tbody> </table>	Step	Procedure	1	Shut down the engine.	2	Check that carburetor actuation effects full travel and that starting carburetors (choke) are in the full off position.	3	If necessary, fit/modify the carburetor actuation as required to achieve full power on both carburetors.		
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2	Once full power has been established on both carburetors, retard the throttle and observe the pressure gauge settings. The pressure gauges should show the same reading for both carburetors. <p><b>NOTE</b></p> <p><i>Discrepancies must be compensated for by adjusting the off idle adjustment.</i></p> <table border="1" style="width: 100%; margin-top: 10px; border-collapse: collapse;"> <thead> <tr style="background-color: #D3D3D3;"> <th style="width: 10%;">Step</th> <th>Procedure</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td>Shut down the engine.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Loosening the locknut on the bowden cable and adjusting the off idle adjustment.</td> </tr> <tr> <td style="text-align: center;">3</td> <td>Tightening the locknut.</td> </tr> <tr> <td style="text-align: center;">4</td> <td>Re-testing the engine.</td> </tr> </tbody> </table>	Step	Procedure	1	Shut down the engine.	2	Loosening the locknut on the bowden cable and adjusting the off idle adjustment.	3	Tightening the locknut.	4	Re-testing the engine.
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3	Tightening the locknut.										
4	Re-testing the engine.										

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Step	Procedure
3	Final idle speed adjustment may be required by resetting the idle speed adjustment screws.
4	Equal adjustment must be made on both carburetors.
5	Any major adjustments required necessitate replaced verification of all parameters mentioned in this procedure.