



„SYNCHROMETER“ Synchron Tester

CARBURETTOR FLOW METER

NEW FLOW METER for TWO-BARREL PROGRESSIVE CARBURETTORS for checking the air flow of the secondary stage throttle.

Instructions:

1. Simply place the instrument into the secondary throat at idle.
The engine speed is not important, but the engine should be at normal operating temperature.
2. The air flow should show the correct value.
3. Operate the secondary throttle only for a moment (on the linkage, shaft or vacuum rod etc.) up to 10 kg/h and release it again. Repeat several times.
4. If the air flow always returns to the former value, the throttle valve is free. If the value is also within the tolerance, the mixture strength and R.P.M. can be adjusted and it will stay that way.
5. If the air flow shows a slightly higher value, but returns to former position slowly (after the primary throttle is operated) the freedom of the secondary throttle is at the limit. The R.P.M. and mixture adjustments may not always be perfect, but satisfactory.
6. If the air flow shows a much higher or lower value and — most important — if this value changes every time after the secondary throttle is operated, it is useless to attempt tuning that carburettor.

The secondary throttle shaft, linkage or valve must be free and always return to the former position, before a correct and long lasting tune, mixture strength adjustment and smooth idle can be achieved.

Until the precise air flow value information is obtainable by the carburettor manufacturer, the correct value can be found very simply by checking the air flow on a few smooth running used or new cars of the same type. The average air flow is then within the tolerance of the correct value.

Experienced values:

WEBER carburettors: On all Weber carburettors, the secondary throttle valve should show an air flow of 1.8 to 2.5 kg/h at idle and low R.P.M.

SOLEX carburettors: Idle air flow of the secondary throttle: 1.3 to 1.8 kg/h. Some new type SOLEX carburettors have a small hole in the secondary throttle plate (easily visible from the top). On such carburettors, the idle air flow is approx. 4 to 5 kg/h.

ZENITH INAT carburettors: Secondary throttle air flow: 1.0 to 1.5 kg/h.

New and rebuild, clean carburettors can be at the high side of the tolerance. Deposits on the throttle valve will reduce the air flow after some time

The technical unit for measuring the air flow is kg/h (kilogramm/hour)

1 kg/h = approx. 0.45 CFM (cubic foot per minute) or 12.92 litre/min.

1 CFM = approx. 2.19 kg/h or 28.317 litre/minute



“SYNCHROMETER”
FLOW METER:

The "Synchronometer" instrument is designed to indicate the air flow very precisely, but also to withstand rough handling and excessive air flow at high R.P.M.

No special care is required to preserve the sensitivity of indication.

A time saving method of checking the secondary throttle plate clearance is now possible by checking the air flow exactly with the

NEW FLOW METER for TWO-BARREL PROGRESSIVE CARBURETTORS

to check the air flow of the secondary stage throttle at idle.

- Most precise indication, especially at 1 to 3 kg/h air flow.
- Within a few minutes, one can check the adjustment of the secondary throttle plate for fast diagnosis.
- This test should be made before every tune up and adjustment of the carburettor. It saves time and is indispensable for a long lasting smooth idle and correct mixture strength.



HOW IMPORTANT IS THE SECONDARY THROTTLE VALVE ADJUSTMENT?

On two-barrel progressive carburetors, the throttle plate of the secondary stage is closed at idle position.

At high load driving (high speed or up hill) the 2nd stage throttle is opened either mechanically or by vacuum.

On most two-barrel carburetors, this throttle is only theoretically closed and the stop lever holds it open "just a crack", so the plate does not wear into the housing.

This "just a crack" opening is like an air-leak, which is about 5 to 10% of the total air flow at idle. However, the idle R.P.M. and mixture adjustment of the primary stage compensates this "leak".

However, if this "just a crack" opening changes every time after the secondary stage has been used, the now different air leak will upset the mixture of the primary stage.

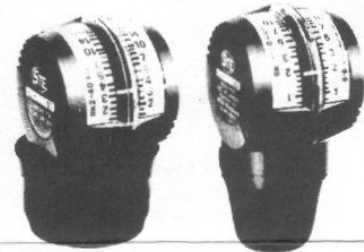
The secondary throttle may be adjusted correctly, but the slight opening is contaminated and less air flow goes through, or the throttle is jammed and does not always return to the correct position.

If one adjusts the R.P.M. and mixture of such a carburettor, the R.P.M. and smooth idle will soon be upset again by the changing air flow of the secondary throttle: Every time this throttle opens at high load, the throttle plate may return to a different opened- or closed position.

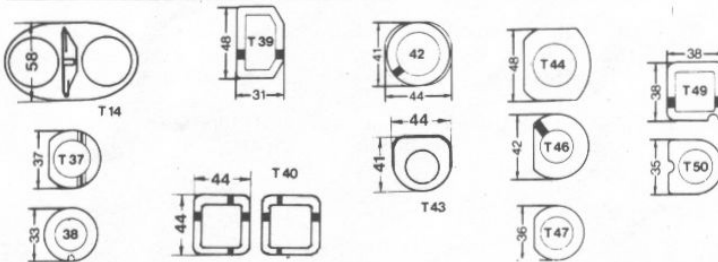
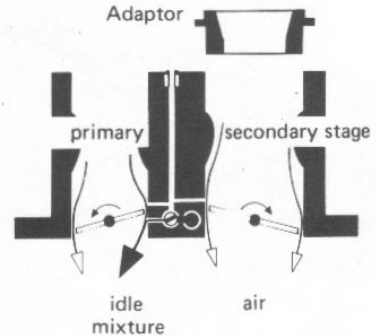
Adaptors for secondary throat of two-barrel carburetors:

No:	suitable for:	approx. size (mm):
T 50	Solex 2 B 2	36 x 30
T 43	Solex DIDTA	41 x 44
T 14	Solex TDID	oval
42	Solex 32 TEIE	41 Ø
42	Weber 32 ADF 4	41 x 44
T 46	Weber 34 DATR, DMTR and CCCP (Lada)	42
T 49	Weber DFAV, DMS, DFH and HOLLEY 5200	38 x 38
T 37	Weber DFT	37
T 40	Weber 32/36 DGAV	44 x 44
38	Weber 30 DGS 1	33 Ø
T 39	Weber 38/36 DM 1	31 x 48
T 47	Weber 32 DMTR	37
T 44	Zenith INAT	45 x 48

"SYNCHROMETER" FLOW METER:
Instrument Type BK Type SK



Adaptor



Made in Germany

General Information:

Synchrometer Flow Meter are designed for measuring the air flow directly on the air intake of the carburetor. The sensitivity of indication is very high on the lower end of the scale to ensure most precise adjustment at idle R. P. M.

The instruments Type BK permit a high air flow, affecting the mixture strength at idle not more than an air filter.

The rubber sleeve of the Type BK is suitable for all intake diam. with approx. 2 inch (48 to 53 mm Ø) without adaptor. The rubber cone of the Type SK is ideal for all ram pipes and intake bores of 1 5/8 to 2 1/8 inch (40 to 55 mm Ø) without adaptor.

If a single instrument is used - Type BK or SK, the following adaptors are sufficient for most carburetors:

No. H 10 "Hold on" angle disc with rubber seal for diameters from 1 5/8 to 2 7/8 inch (40 to 73 mm Ø).

No. 18 a short rubber cone for intake bore from 1 1/8 to 2 inch (29 to 51 mm Ø) ideal for all Stromberg and S.U. Carburetors

No. 118 a long rubber cone (not necessary for Type SK) for ram pipes.

Instructions:

1. Remove the airfilter and attach the Synchrometer to the carburettor intake (with adaptor if necessary).
2. Check if the Synchrometer indicates an equal air flow on all intakes at idle and higher R.P.M.
3. The air flow deviation should be not more than 1 line of the scale at idle and 2 lines at higher R.P.M. Accelerate and decelerate several times while observing the air flow (of two instruments) to detect and locate jamming linkage, excessive play of joints and weak returning springs etc.
4. To synchronize the idle air flow, it is suggested to disconnect the carburetors in order to permit separate adjustment of each carburetor (linkage or rod between the carburetors on some carb. set ups) Adjust the idling stop or, on some carbs. the idle speed by-pass until the correct idle R.P.M. is reached and at the same time, the Synchrometer indicate an equal air flow. It is suggested to check and readjust the idle mixture at this time.
5. Replace the linkage between the carburetors again and check the air flow. This linkage (lever or rod) must be adjusted until an equal air flow is indicated at idle, transition (up and down) to high idle and high R.P.M. Check as described above (3)

While a single instrument is sufficient, it takes more time and the use of two matched SYNCHROMETER instruments has many advantages: The instrument stay connected to the carburetors with hands free for adjusting, tuning and accelerating etc. It saves time and makes it much easier to locate jamming joints at different R.P.M. The air flow can constantly be observed until the tune up is completed with all timing, mixture and high idle warm up adjustments. On engines with high milage, the fumes from the crankcase will affect the idle mixture strenght and R.P.M. For final tuning without air filter/housing connection to the crankcase, the hose can be extended and connected to the by-pass holes of the Type BK SYNCHROMETER. This saves time because in many cases the gases from the crankcase will change the mixture and R.P.M. considerably and would require re-synchronizing and removal of the air filter again.

Two adaptors are required if two matched Synchrometer are used. Exceptions: Twin adaptors such as No. T 40.

The Type BK Synchrometer fits many carburetors with an intake diam. of 2 inch, such as CITROEN VISA GT, Mercedes 200, Opel, VW without adaptor. It is also ideal for BMW Motorcycles and fits tightly on the plastic tube (carb. to air filter) which serves as adaptor.

All adaptors listed fit to Synchrometer Type BK (with rubber sleeve) and also Type SK (with rubber cone)



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CARBURETOR FLOW METER

Type BK Synchrometer

for synchronizing all multiple carburettor systems. Maximal air flow with open by-pass up to 50 kg/h for higher R.P.M. synchronization on larger engine, also for checking and adjusting the air flow of the secondary stage air flow indication range with by-pass closed: 1 to 35 kg/h Turning of the rubber sleeve closes the by-pass.



Type SK Synchrometer

for synchronizing all multiple carburettor systems and also for checking and adjusting the air flow of the secondary stage throttle at closed (1 1/2 to 2 1/2 kg/h) (idle) position on progressive carburetors. Air flow indication: 1 to 30 kg/h

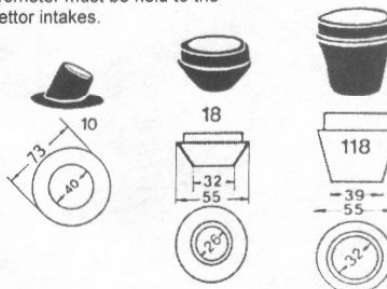


- The instruments are very robust and withstand excessive air flow and rough treatment.
- Precise indication in all angles and positions.

Universal adaptors for application of single instruments:

With these "hold on" adaptors, the Synchrometer must be held to the carburettor intakes.

"SYNCHROMETER" Adaptor



Some adaptors are required regardless if a single or two matching Synchrometers are used, because of the special shape of the carburettor intake or difficult to reach intake opening: These and all adaptors on the list AFV are made to fit tight on the carburettor.

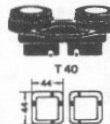
No. P 01
ZENITH INAT
Carburetor: BMW
Mercedes, Opel



No. 06
Weber or
Solex
Alfa Romeo



No. T 40
Twin adaptor
WEBER DGAS
and DGAV



No 41
Weber DCNF and
Various other
Carburetors



Adaptors marked P (Polyamid) or T (special) are suitable only for the carburetors listed. All other adaptors are made of synth. rubber and can also be used for intake diameter of similar size. Adaptor combinations are possible for difficult to reach intake openings. Especially suitable for combinations are: Angle extension No. 08, short angle adaptor No. 28 and ' offset adaptor No.54.

"SYNCHROMETER" Adaptor List for synchronizing multiple carburetors



		Adaptor No.:	
ALFA ROMEO			
all models	SOLEX 40 DDH or	(n)	06 SK
	WEBER 40 DCOE	(n)	06 BK
Giulia Super	SOLEX 40 PHH	(10)	02 or 45
AUSTIN ROVER and all cars with Stromberg CD and S.U. Carburetors:			
	S.U. HS 2	(18)	22
Stromberg 150 CD/	S.U. HS 4	"	24
Stromberg 175 CD/	S.U. HS 6	"	26
	S.U. HIF 6	(18)	26 + 27
(see Rover)	S.U. HD8/HS 8	(18)	28 BK
Austin Princess 2200	(+angle extension)	(n)	08
ROVER			
3500 V 8	S.U. HIF		
	(to fit inside flange)	(n)	08 BK
2600 3,5	S.U. HS 6	(18)	26 BK
2000 TC	S.U. HS 8	(n)	28 BK
BMW PKW			
1600, 1800, 2000 Ti	Solex 40 PHH	(10)	02 or 45
2.5 - 2.8 - 3 Ltr.	Zenith INAT	(n)	01 BK
3,2 Ltr. S	Solex PAITA	(10)	04 BK
BMW Motorcycle			
R 50 Nr.23	R 60 Nr.25		23/25 BK
R 75 to R 100 S:	No adaptor required with BK		
Instruments fit on the original pipe for the air cleaner			
CARTER Carburetors			
2 and 4 Barrel	133 mm Ø 5 1/4" (incl. No 10)		35/10 BK
CHRYSLER/ SIMCA			
160 GT, 180	Weber 38 ADS	(n)	41 BK
Simca 1300		(n)	03
Simca 1100, Bagheera	Weber 36 DCFN	(n)	41
CITROEN			
SM	Weber 42 DCFN	(S)	118 SK
Visa GT	Solex 35 BISA	(B)	H 10
DATSUN			
1600: Nr. 24,	1800, SS	(18)	26
240 Z (without by-pass System)		(18)	25 BK
260 Z (with by-pass System)		(n)	129 BK
FERRARI			
BB 512 (adaptor combination)		(S)	118 + 28 + 54 SK
308		(S)	118 + 18
Weber 40 DCN			13
Weber DCFN			41
FIAT			
124 Sport (110 PS)	Weber(with ram pipe)	(18)	11
Dino Coupe	Weber 40 DCN/ DCFN	(n)	13
130 Weber DCF	(twin adaptor)	(n)	15 BK
FORD			
20 M etc.Solex DDIST (twin adaptor)		(n)	14
2,0 - 2,3 - 2,6 - 2,8 Solex EEIT (twin adaptor)		(n)	20
3 Ltr. Weber DGAS (twin adaptor)		(n)	40 BK
RS: Escort 2 Ltr. and Fiesta 1,1 Ltr.		(18) (S)	41
HOLLEY Carburetors			
2300 2 Barrel „D" shape		(n)	30
4150/60 4 Barrel 124 mm Ø 4 7/8"(incl.No.01)		(n)	31/01 BK
4500 4 Barrel 184 mm Ø 7 1/4"		(n)	32 BK
HONDA			
Civic S (also TRIUMPH Acclaim)		(n)	H 10
Prelude 1983		(n)	60
Prelude	with catalyst	(n)	60 + 61
LANCIA			
Flavia	Weber 40 DCN	(n)	13
Fulvia	Weber (with ram pipe)	(18)	109
LOTUS			
Cortina GT		(n)	06
MASERATI			
	Weber DCFN	(S)	41 + 118
MAZDA			
323 GT	Hitachi Carburettor	(10)	45
MERCEDES BENZ			
200: Solex PDSI: no adapter required		(B)	BK
220 S to 63:	Solex PAITA/PICB	(n)	04 BK
220, 230, 250, 280 S	with Zenith INAT	(n)	01 BK
MITSUBISHI			
Caleste 2000, Sapporo GSR 2000		(10)	45
OPEL			
Rallye Kadett and Olympia: no adapter required		(B)	
Rekord Sprint	Weber 40 DFO	(n)	03
All 6 Zyl.with Zenith INAT		(n)	01 BK
PEUGEOT			
304 S	35 EEISA (Solex)	(n)	20
205	no adapter required	(B)	
PORSCHE			
616 and all carb. with Zenith NDIX		(B) (n)	11
Super 90, 911, 912, 914/6 etc.			
all models with ram pipes		(S)	118 SK
RENAULT			
Albine, R 8 Gordini,	Weber 40 DCOE	(n)	13
R 12 G	Weber 45 DCOE	(n)	109
SAAB			
GLE	Stromberg CD	(n)	36/25 or 109
TALBOT			
Sunbeam Sceptre/ Rapier, Stromberg 150 CD		(18)	24
Sunbeam Ti 1600	Weber 40 DCOE	(n)	36 + 25
Sunbeam Lotus Dell' Orto DHLA		(n)	25
TOYOTA			
Celcia 1600 ST		(10)	45
Celcia GT			26
VOLVO			
122 S, 544, B 16	S.U. HS 4	(18)	24 BK
B 20, B 30, S.U. HS6 or Stromberg 175 CD		(18)	26 BK
144 S, B 20 D	S.U. HIF 6	(18)	26 + 27 BK
VW			
Type 3: 1500/ 1600:	no adapter required for intake neck with 2 inch diam.	(B)	BK
Type 2 and 4:	Transporter, Bus, 411	(n)	45
K 70	Solex 40 DDHT till 1973	(n)	116 BK

All adaptors listed fit to Synchrometer Type BK (with rubber sleeve) and also Type SK (with rubber cone). These tight fit adaptors are especially required if a set of two Synchrometers are used. The code shown with the adaptor No. (x) indicates which adaptor is suitable if a single Synchrometer is used:

- (n) This adaptor is necessary, regardless if a single or two matched Synchrometers are used.
- ((H 10) Adaptor No.H 10 suitable for single Synchrometer
- (18) Adaptor No. 18 suitable for single Synchrometer
- (B) No adaptor required if a single Type BK is used.
- (S) No adaptor required if a single Type SK is used.

The suggested type of Synchrometer is shown after the No. of the adaptor:
 BK = preferably Type BK: For a higher air flow to check and synchronize at higher R.P.M.
 SK = preferably Type SK

A single SYNCHROMETER instrument is sufficient. However, the tune up specialist will save time by using two or more instruments. With special adaptors, the instruments stay on the carburetors and the hands are free for accelerating and adjusting to provide best possible tuning results.
 Two adaptors are required if two instruments are used except twin for adaptor No.14, 15, 20 and 40.

Made in Germany