

MASTER CYLINDERS WITH HYDRAULIC BOOSTER

- Simple and Stepped-Bore Master Cylinders
- Single and Dual Circuit with Open Centre Booster
- Single and Dual Circuit with Open Centre Booster and Accumulator
- Single and Dual Circuit with Closed Centre Booster
- Balanced Twin Master Cylinders with Closed Centre Booster
- Pedal Supports and Circuit Parts



010 - GENERAL DESCRIPTION

020 - OPEN CENTRE SINGLE CIRCUIT BOOSTER

030 - OPEN CENTRE DOUBLE CIRCUIT BOOSTER

040 - OPEN CENTRE SINGLE CIRCUIT BOOSTER WITH ACCUMULATOR

050 - OPEN CENTRE DOUBLE CIRCUIT BOOSTER WITH ACCUMULATOR

060 - CLOSED CENTRE SINGLE CIRCUIT BOOSTER

070 - CLOSED CENTRE DOUBLE CIRCUIT BOOSTER

080 - CLOSED CENTRE SINGLE CIRCUIT BOOSTER FOR MINERAL OIL

090 - CLOSED CENTRE DOUBLE CIRCUIT BOOSTER FOR MINERAL OIL

100 - CLOSED CENTRE BALANCED DOUBLE CIRCUIT BOOSTER FOR MINERAL OIL

110 - ACCESSORIES

120 - CODIFICATION

010

020

030

040

050

060

070

080

090

100

110

120

MASTER CYLINDERS WITH HYDRAULIC BOOSTER

GENERAL FEATURES

SAFIM has been manufacturing this type of product successfully since 1979. These devices are used to operate the brakes of industrial vehicles and have replaced ordinary brake pumps and other devices which used to require the installation of bulky additional systems on vehicles.

The advantages offered by this unit are:

- high braking pressures
- low pedal force (reduction of 75-90%)
- simple hydraulic system
- compact dimensions
- perfect braking control

The brake cylinder (or master cylinder) and the booster are coaxial and their inner parts are superimposed in order to reduce the unit length.

Both the master cylinder and the booster find themselves in two separate housings in order to allow different master cylinder-booster combinations and to meet each customer's requirements in the best possible way.

The master cylinder is available in two versions: with a step bore piston; with a conventional fixed diameter piston.

Both versions have been designed to be used with single or twin-circuit braking systems.

Four classes of hydraulic boosters are available in combination with the master cylinder parts:

1. Open centre boosters (see page 010.040)
2. Open centre boosters with accumulator (see page 010.060)
3. Closed centre boosters with actuating rod (see page 010.080)
4. Closed centre boosters for mineral oil (see page 010.100)

All boosters are of the follower-type, that is the pressure modulating valve is inside the piston operating the master cylinder.

The actuating rod has a pressure sensitive surface which reacts proportionally to the booster operating pressure.

The Master cylinders are available for mineral oil (compatible with oils such as ATF DEXRON II and LHM) and for brake fluid (DOT3-4, except for the last class of boosters, which is only for mineral oil).

The master cylinder and booster circuits are completely separate so that oils don't mix up.

STEP BORE MASTER CYLINDERS WITH DUAL DIAMETER PISTON

These master cylinders have a step bore piston, with special valves fitted internally which regulate their operation.

The brake fluid in the vehicle can be displaced by the larger diameter piston in large volumes, but at low pressure.

The valves are regulated in such a way that once a pressure level has been reached, at which the brakes friction surfaces are in line (filling pressure), the larger diameter piston is being gradually inhibited, allowing the smaller diameter piston to take over. Thus high brake pressures can be obtained without excessive efforts.

For the reasons explained above, these master cylinders do not meter out a specific fluid volume, but a variable one, depending on the type of brake system, brake clearances, etc.

DOUBLE CIRCUIT MASTER CYLINDERS

In these master cylinders the circuits are placed in tandem. The first circuit piston is operated directly by the booster. In the second circuit, the piston is moved thanks to the pressure generated by the first circuit piston; therefore no matter how big the second circuit work diameter is, in both circuits there is the same pressure.

MASTER CYLINDER WITH HYDRAULIC BOOSTER :
SELECTION CRITERIA

WHEN IT'S BETTER TO PREFER A SIMPLE MASTER CYLINDER OR A STEP BORE MASTER CYLINDER

The single diameter master cylinders are usually simple and cost effective.

The main advantages of the step bore master cylinders are a big displacement and the high braking pressures even without booster feeding. For this reason, they are much appreciated, as they enable to avoid the installation of hydraulic accumulators or other emergency devices working when the engine is off. In brake systems requiring a big displacement before starting to brake, they enable to reduce the filling stroke and to increase the working stroke.

HOW TO CHOOSE A MASTER CYLINDER WITH BOOSTER

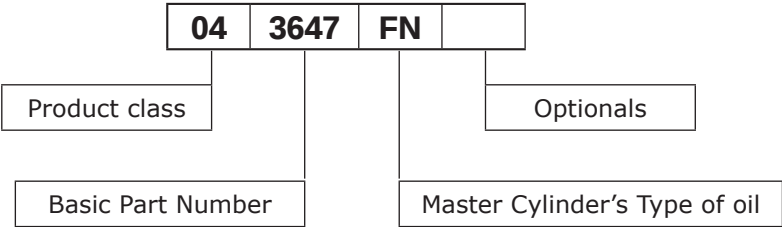
The kinds of master cylinders satisfying the hydraulic system features are selected first of all according to the number and the displacement of circuits. The displacement you need to consider is the one requested in case of worn brakes, or the maximum one in case of circuits with clearance recovery and anyway it must be increased by a safety factor (approximately at least by 50%). The booster is chosen according to the available energy source. Open-centre boosters with or without accumulator need a continuous oil flow; therefore a little pump used just for that purpose or a priority valve installed in an existing circuit is necessary. Some features and possible schematics for open-centre boosters are shown on page 010.050. For open-centre boosters with accumulator see page 010.070.

Closed-centre boosters need a pressure source, but not a continuous oil flow; the following are often suitable for this purpose: pressurized lines for boosters or clutches, hydrostatic transmission replenishing pressure, etc.. Alternatively, load sensing circuits may be used. Safety accumulators can be installed on this booster type if necessary. Some features and possible schematics for closed-centre boosters with rod are shown on page 010.090. Closed-centre master cylinders for mineral oil are described on page 010.110.

If the braking pressure is known, it's possible to get the approximate force on the push-rod from the diagrams related to the different master cylinders and the pedal force according to the lever ratio. In open centre master cylinders (with or without accumulator) the maximum booster pressure can be adjusted directly by the booster relief valve. Closed-centre master cylinders don't have an inner pressure regulation valve and it's therefore necessary to find a good combination between master cylinder, feeding pressure and braking system. Alternatively, it's possible to use a pressure limiting valve (when the feeding pressure is too high) or systems provided with accumulator charging valve. Often the need to install accumulators or other devices for the emergency braking depends on the braking pressure that can be obtained without the booster action. This value can be derived from the same diagrams related to the master cylinders technical features approximately, according to the pedal ratio and to the comfort needed for the driver's seat. In any case it's necessary to carry out an experimental trial in the different work conditions.

ORDER PART NUMBER EXPLANATION

The order part number is composed by several parts, like the example below :



Each master cylinder is uniquely identified by the basic part number, the type of oil and the optionals. The product class can vary depending by the production's period, because it identifies a stage of development of the component; it doesn't change the basic characteristics of the assembly, that results still valid for the vehicle's approval test. This note is important to find the correspondences between two codes: for example, 021037FN and 031037FN are now produced with the part number 041037FN

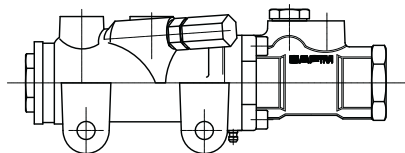
INSTALLATION ADVICE

THE MASTER CYLINDER SELF-BLEEDING CAPACITY DEPENDS ON THE ASSEMBLY ORIENTATION(*)

ASSEMBLY ORIENTATION OF SAFIM MASTER CYLINDERS WITH BOOSTER (*)

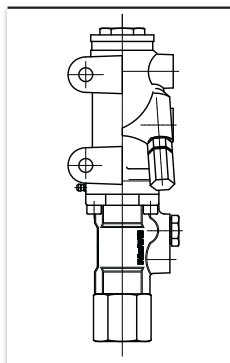
HORIZONTAL (WITH PORTS TURNED UPWARDS)

Correct assembly orientation of a standard master cylinder. SAFIM master cylinders with booster are self-bleeding with ports turned upwards



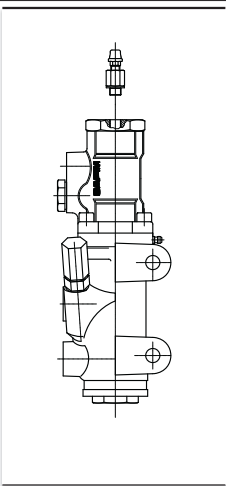
VERTICAL (WITH MASTER CYLINDER TURNED DOWNWARDS)

Some versions of master cylinders assembled vertically with master cylinder turned downwards are self-bleeding or have minor displacement decreases. Most of the other models are produced in longer versions (with different part number), but they're self-bleeding horizontally, vertically with ports turned downwards and in all intermediate positions.



VERTICAL (WITH MASTER CYLINDER TURNED UPWARDS)

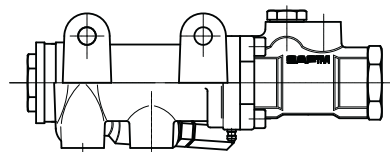
The vertical assembly with master cylinder turned upwards is not self-bleeding. In this case for single circuit master cylinders it's possible to buy versions with M10x1 head hole that enables to fit a screw for the manual bleeding



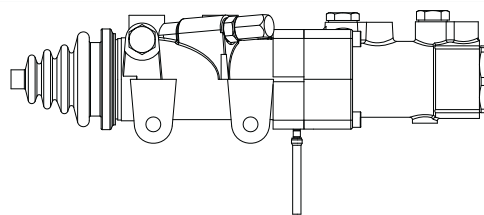
HORIZONTAL (WITH BOOSTER PORTS TURNED DOWNWARDS AND MASTER CYLINDER PORTS TURNED UPWARDS)

SAFIM master cylinders can't be assembled with the master cylinder fittings turned downwards. The booster can be assembled in any position; there are specific versions with booster rotated by 180° with respect to the master cylinder for the assembly of the booster fittings turned downwards.

(*) WARNING: master cylinders from page 080.080 to page 080.140 have completely different assembly orientations, see instructions on page 080.070.

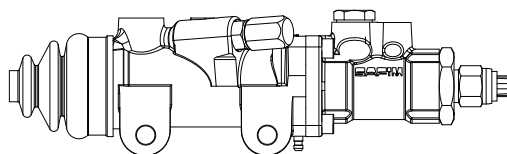


Master cylinders for brake fluid (DOT 3-4) have always a vent-hole, that must be always turned downwards (when the master cylinder is vertically mounted, it's advisable to slightly incline it towards the vent-hole if possible).



These master cylinders have a little transparent rubber tube assembled on the vent-hole; this tube protects the master cylinder inner parts from the water-jets used when washing the vehicles.

There are versions available with a M10x1 hole on the plug, often used to assemble the stop lights pressure switch. (See page 120.010).



OTHER USEFUL ADVICE

Use hoses with big inner diameter, especially in combination with step bore master cylinders or with mineral oil (don't use rubber hoses for brake fluid DOT 3-4 with mineral oil, because they may expand and result in a partial or total occlusion of the passage area).

Use stiff metallic pipes, where possible.

If the hydraulic system is made up of long pipes or the displacements are big, it's better to use fluids with a lower viscosity degree such as DEXRON II (red) or LHM (green), compatible with seals for mineral oil rather than the standard mineral oil.

OPEN-CENTRE BOOSTER

ADVANTAGES:

- Economic
- Very simple hydraulic circuit
- Booster that can be set at different values with relief valve included
- Big reduction of the pedal force

Master cylinders with open centre booster have been produced since 1979 and they were the first products to be manufactured by SAFIM.

Thanks to continuous improvements, this kind of master cylinder is extremely economic and reliable.

Open centre boosters are of the follower-type; the push-rod has a sensitive surface providing a reaction proportional to the booster working pressure.

This kind of booster must be fed by a continuous oil flow.

The maximum operating speed of the master cylinder with booster is proportional to the flow rate

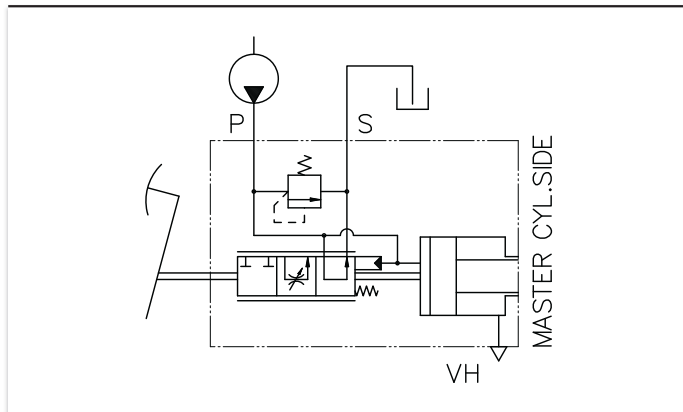
supplied by the pump; the latter must fill the volume defined by the booster stroke. The correct feeding flow rate varies from 3.5 l/min (ø38 and ø40 boosters) or 5 l/min (ø50 boosters) up to 22 l/min. Lower flow rate values don't ensure the necessary operating speed, whereas higher values increase the pressure drops through the booster.

The pressure inside the booster is limited by a safety valve included in the booster itself.

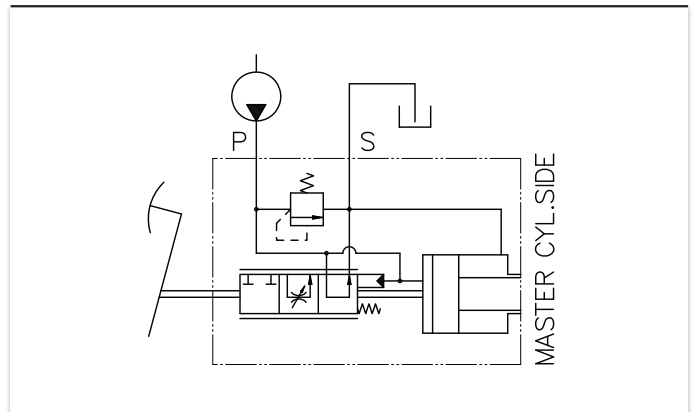
The safety valve is usually set according to the maximum braking pressure; if a specific value isn't given, the standard setting is 50 bar. The standard valve can be set from 30 to 80 bar; for lower values a low-pressure valve must be required (letter "L" after the standard part number).

All boosters installed on master cylinders for brake fluid (DOT 3-4) have a chamber opened towards the outside. If the master cylinder is for mineral oil, this chamber is usually connected to the tank.

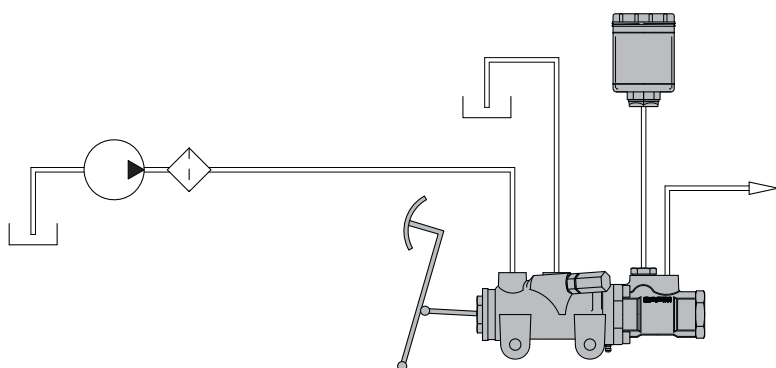
MASTER CYL. W. BRAKE FLUID (FN)



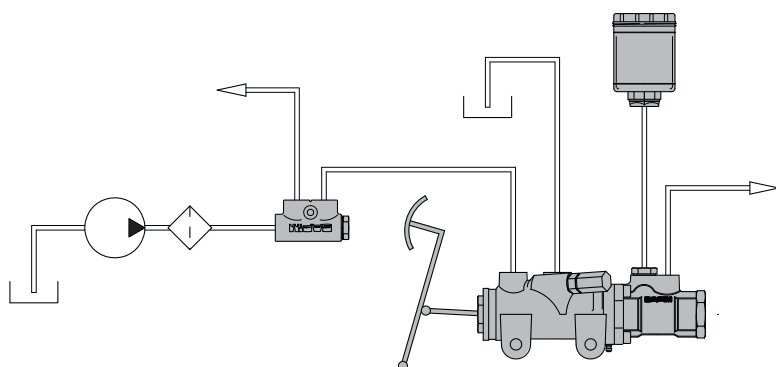
MASTER CYL. W. MINERAL OIL (MN)



FEEDING OF OPEN-CENTRE BOOSTERS : HYDRAULIC SCHEMATICS



An open-centre booster can be fed directly by a gear pump.



In most applications open-centre boosters are fed through a priority valve already installed in the vehicle.
(Priority valve, see page 110.050)

OPEN CENTRE BOOSTER WITH ACCUMULATOR

ADVANTAGES:

- Possibility to brake without oil feeding
- Booster that can be set at different values with relief valve included
- Big reduction of the pedal force

This kind of booster directly derives from open centre boosters; it also uses an accumulator for the booster feeding in emergency cases.

Open-centre boosters with an accumulator are often used when it's impossible to get a satisfactory emergency braking without the booster is lacking.

A warning light or an acoustic transponder warning against a low accumulators charge needs to be installed in order to use this master cylinder in the correct way.

The accumulator is re-charged by the booster pressure; these pressures are regulated by the same booster safety valve.

Before starting moving the vehicle it's necessary to depress the brake pedal deeply for some seconds

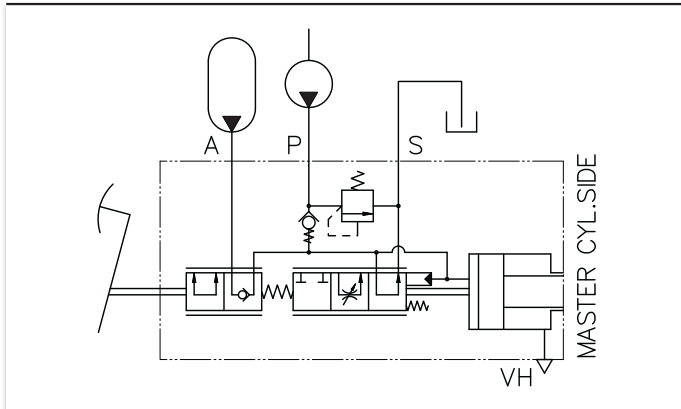
in order to charge the accumulator (until the warning light switches off). Otherwise it's possible to install an accumulator charging valve keeping the accumulator charged automatically; this valve can also keep charged accumulators destined to other services. The accumulator pressure is regulated by this valve.

All boosters installed on master cylinders for brake fluid (DOT 3-4) have a chamber open towards the outside. If the master cylinder is for mineral oil, this chamber is usually connected to the tank.

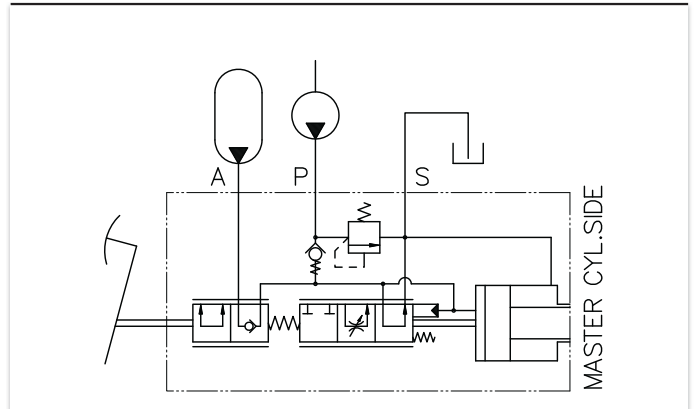
The pushing point of the rod (connected to the pedal) on the master cylinder is to be found on the feeding rod, but not inside the master cylinder housing. In order to avoid that the push-rod might come out from its seat, (fact that that can make it impossible to brake) it's necessary to lock the push-rod to his seat or alternatively to give a guide to the push-rod enabling it to keep in the correct position (see page 010.120).

The accumulator gas pre-charge pressure must be approximately 50% of the booster relief valve setting pressure

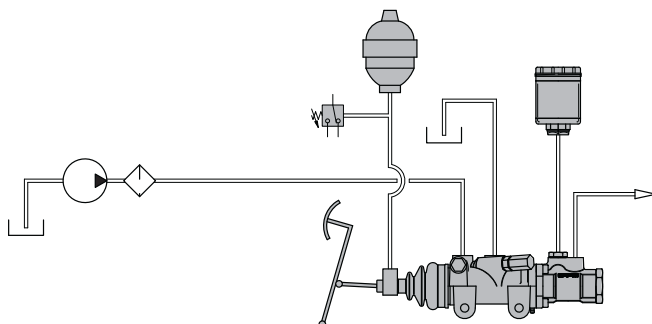
MASTER CYL. W. BRAKE FLUID (FN)



MASTER CYL. W. MINERAL OIL (MN)



FEEDING OF OPEN-CENTRE BOOSTERS WITH ACCUMULATOR : HYDRAULIC SCHEMATICS

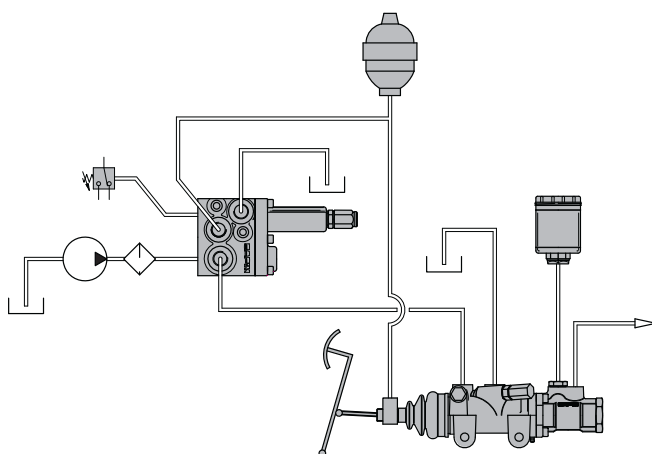
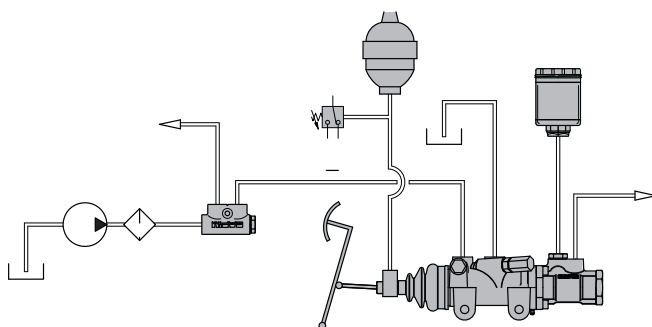


This is the easiest and economical way to feed an open centre booster with accumulator.

The accumulator is charged by the booster pressure, therefore whenever a braking action is carried out.

It's necessary to depress the brake pedal deeply before starting moving the vehicle.

The pressure switch warns against a low accumulator pressure.



An accumulator charging valve is used for the accumulator automatic charge.

This kind of system allows the automatic accumulators charging. When the engine is on, the booster works with oil coming from the pump through the accumulator charging valve, without pump feeding (engine off) the booster works with oil coming from the accumulator.

CLOSED CENTRE BOOSTER WITH ROD

ADVANTAGES:

- Low power consumption for the booster feeding
- Big reduction of the pedal force
- Available versions for brake fluid
- Possibility to install an accumulator to feed the booster when the engine is off

This kind of booster is fed by a pressurized line from which it takes just the oil necessary to fill the booster chamber. This often enables to feed the booster with steady-pressure lines already present on the vehicle, such as the hydrostatic transmission replenishing pressure, or a pressurized line feeding the hydraulic pilots.

The maximum operating speed depends on the available flow.

On the booster there aren't any pressure reducing valves for the regulation of its inner maximum pressure, therefore it's necessary that the feeding pressure is compatible with the features of the booster and the vehicle.

In case the feeding pressure is too high, the booster might be fed by a pressure reducing valve. This booster might be fed by an accumulator char-

ging valve keeping pressure within a set range. This valve can also keep charged accumulators destined to other services.

If it's impossible to get a satisfactory emergency braking without booster, it's advisable to fit an accumulator in the feeding line.

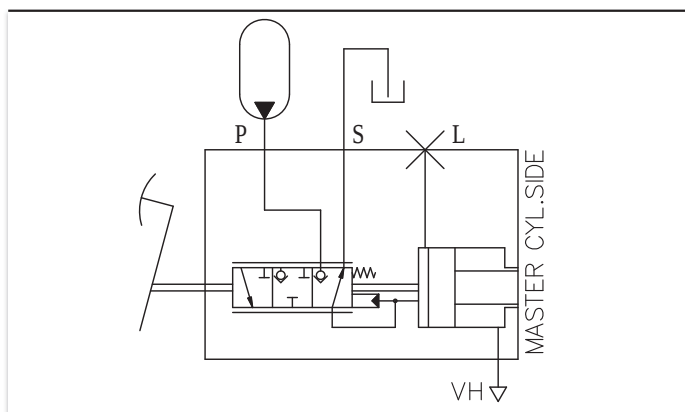
In this case it's necessary to fit a warning light, or an acoustic transponder in the cab warning against a low accumulators charge.

The pushing point of the rod (connected to the pedal) on the master cylinder is to be found on the feeding rod, but not inside the master cylinder housing. In order to avoid that the push-rod might come out from its seat, (fact that that can make it impossible to brake) it's necessary to lock the push-rod to his seat or alternatively to give a guide to the push-rod enabling it to keep in the correct position (see page 010.120).

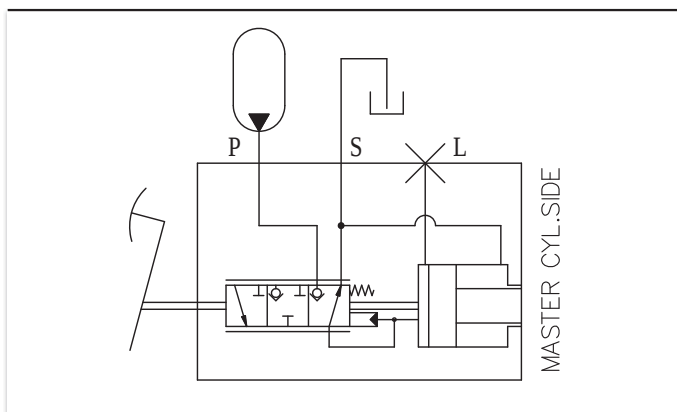
All boosters installed on master cylinders for brake fluid (DOT 3-4) have a chamber opened towards the outside. If the master cylinder is for mineral oil, this chamber is usually connected to the tank.

The accumulator gas pre-charge pressure must be approximately 50% of the booster pressure.

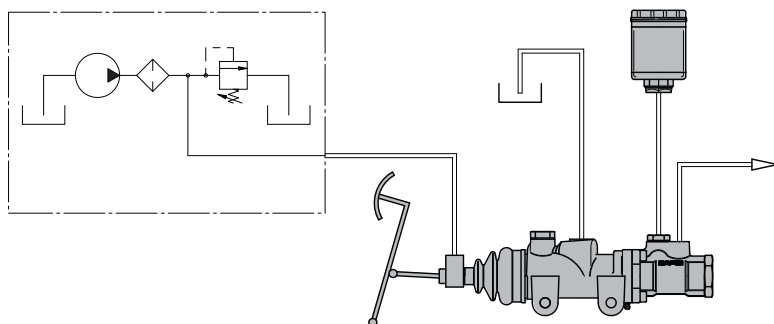
MASTER CYL. W. BRAKE FLUID (FN)



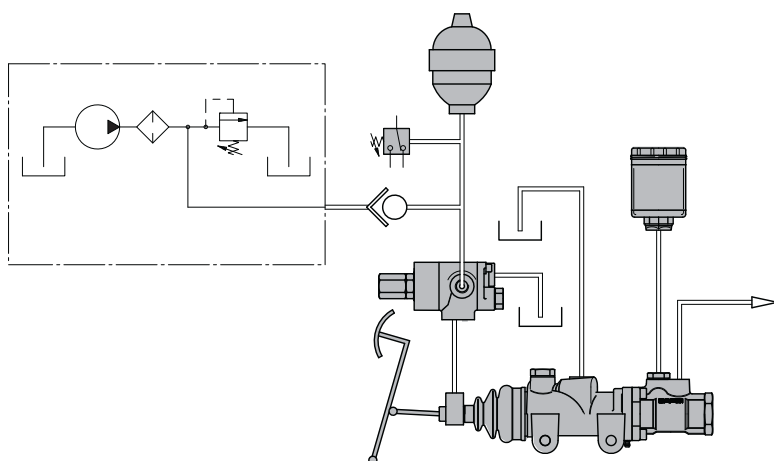
MASTER CYL. W. MINERAL OIL (MN)



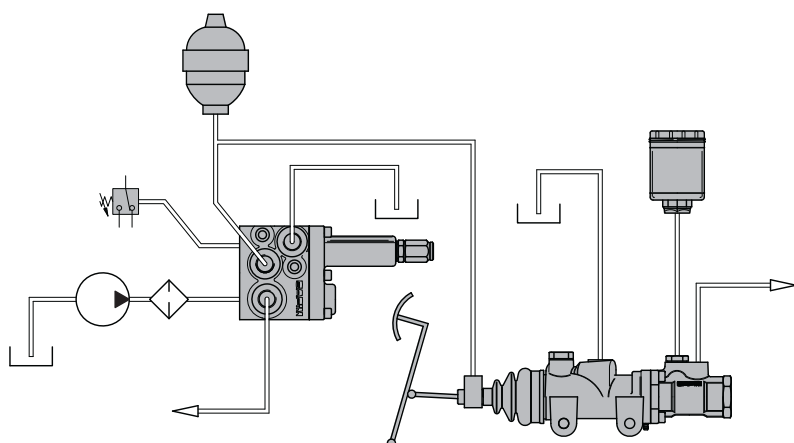
FEEDING OF CLOSED-CENTRE BOOSTERS WITH ROD : HYDRAULIC SCHEMATICS



Closed centre boosters can be fed by any pressurized circuits in the vehicle.



If there is a steady-pressure circuit with a too high value on the vehicle, a pressure limiting valve can be used.
An accumulator and a check valve can make it possible to brake with engine off too.



Closed centre master cylinders can be fed by an accumulator keeping a specific pressure range by an accumulator charging valve.

CLOSED CENTRE BOOSTER FOR MINERAL OIL

ADVANTAGES:

- Low power consumption for the booster feeding
- Wide range of versions
- Big reduction of the pedal force
- Possibility to install an accumulator to feed the booster when the engine is off too

This kind of booster is fed by a pressurized line from which it takes just the oil necessary to fill the booster chamber. This often enables to feed the booster with steady-pressure lines already present on the vehicle such as the hydrostatic transmission replenishing pressure, or a pressurized line feeding the hydraulic pilots.

The maximum operating speed depends on the available flow.

On the booster there aren't any pressure reducing valves for the regulation of its inner maximum

pressure, therefore it's necessary that the feeding pressure is compatible with the features of the booster and the vehicle.

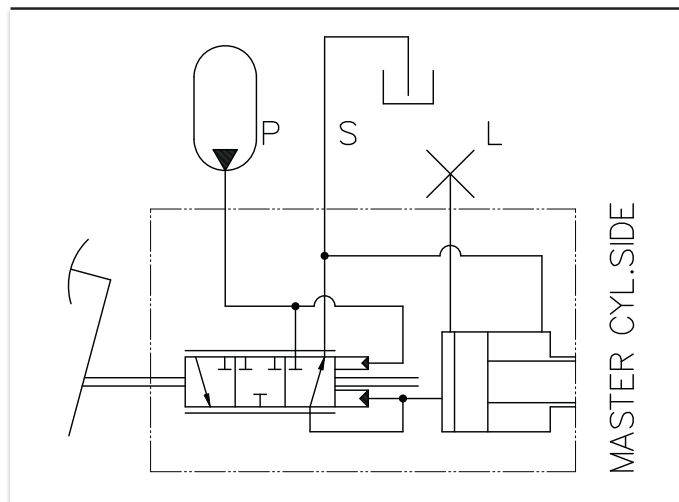
In case the feeding pressure is too high, the booster might be fed by a pressure reducing valve.

This booster might be fed by an accumulator charging valve keeping pressure within a set range. This valve can also keep charged accumulators destined to other services.

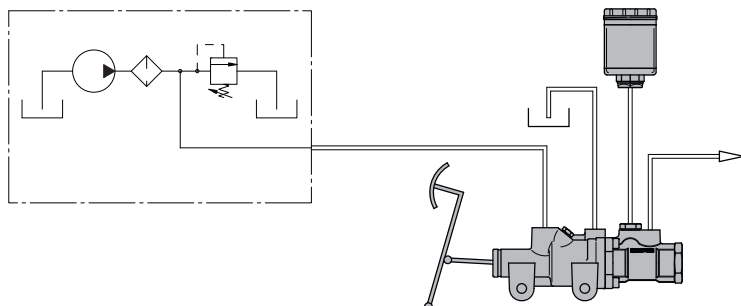
If it's impossible to get a satisfactory emergency braking without booster, it's advisable to fit an accumulator in the feeding line.

In this case it's necessary to fit a warning light, or an acoustic transponder in the cab warning against a low accumulators charge.

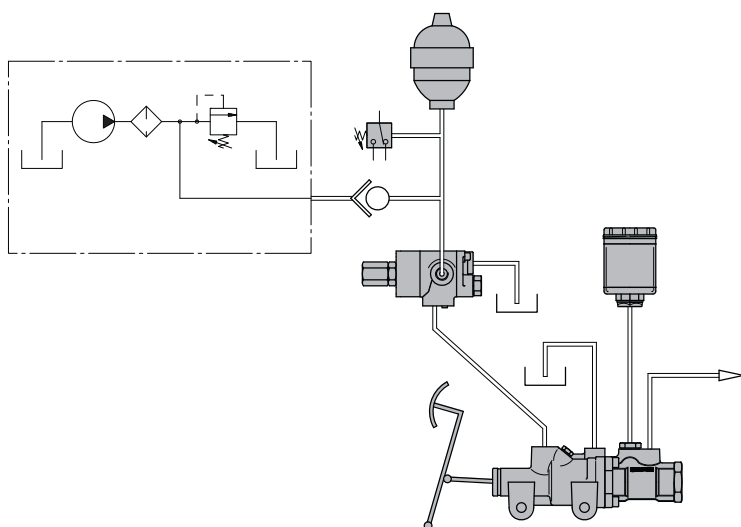
The accumulator gas pre-charge pressure must be approximately 50% of the booster pressure.



FEDING OF CLOSED-CENTRE BOOSTERS FOR MINERAL OIL : HYDRAULIC SCHEMATICS



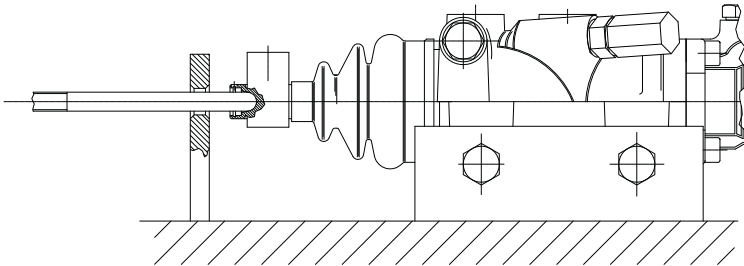
Closed-centre boosters can be feed by any pressurized circuits in the vehicle.



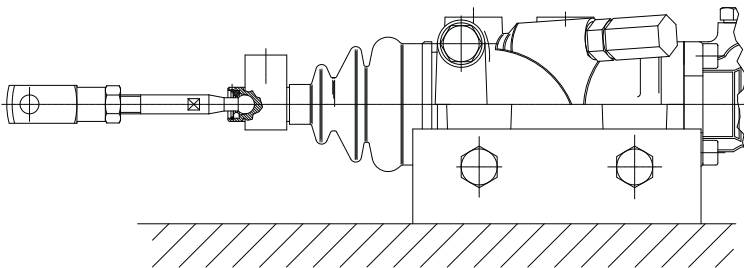
If there is a steady-pressure circuit with a too high value on the vehicle, a pressure limiting valve can be used.
An accumulator and a check valve can make it possible to brake with engine off too.

MASTER CYLINDERS WITH PRESSURE INLET ON THE ROD: PUSH-ROD ASSEMBLY

If the push-rod comes out from its seat, it might be that it doesn't keep into its guide, but it's in such a position that will make it impossible to operate the master cylinder by the following braking. There are two ways to avoid it:



A guide forces the push-rod to keep always coaxial to the master cylinder.



A spherical joint connected to a seeger ring prevents the push-rod from coming out, by keeping always in contact with the master cylinder.

(optional "SAFETY PUSH-ROD", see table on page 120.010)

ATTENTION!

The push-rod clearance regulation must be carried out with pressure inside the booster, with the engine started, for every type of master cylinder.

GENERAL USE RANGES

(The specific features of every master cylinder are listed on the data sheets)

MAXIMUM BRAKING PRESSURE	Up to 150 bar
MAXIMUM BOOSTER PRESSURE	
- Closed-centre boosters for mineral oil Ø 46	Up to 40 bar
- Other boosters	Up to 80 bar
MAXIMUM PRESSURE ALLOWED IN THE TANK	0.5 bar

OPEN CENTRE BOOSTERS, WITH OR WITHOUT ACCUMULATOR

FEEDING	
- Ø38 and Ø40 boosters	From 3.5 to 15 l/min
- Ø50 boosters	From 5 to 22 l/min
MAXIMUM FEEDING PRESSURE WITHOUT LOAD	
(Open-centre boosters)	1.5 bar

INSTALLATION REQUIREMENTS : BOOSTER HYDRAULIC SYSTEM

BOOSTER FEEDING FLUID	MINERAL OIL
REQUESTED FILTRATION DEGREE	NAS 1638 class 9

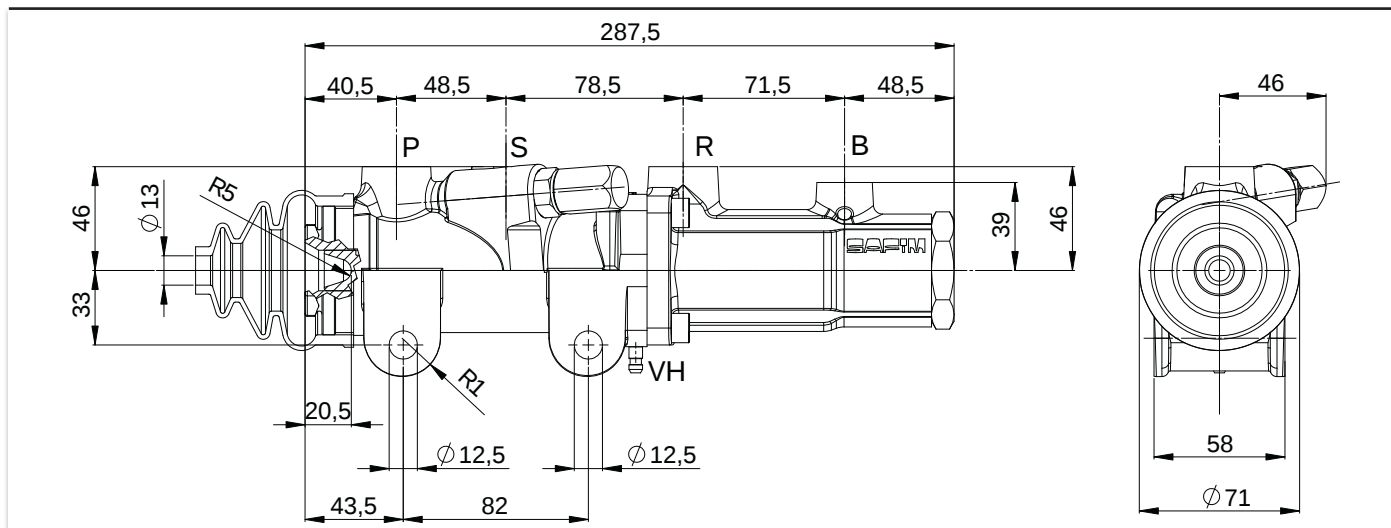
INSTALLATION REQUIREMENTS : BRAKING CIRCUIT FOR MASTER CYLINDERS MARKED "FN"

MASTER CYL. SIDE FLUID FN type	BRAKE FLUID DOT 3 / DOT 4 (SAE j1703)
WORKING TEMPERATURES: BRAKE FLUID (DOT 3 / DOT 4)	-30°/+100°C

INSTALLATION REQUIREMENTS : BRAKING CIRCUIT FOR MASTER CYLINDERS MARKED "MN"

MASTER CYL. SIDE FLUID MN type	Mineral oils such as: Hydraulic oil, DEXRON II, LHM
WORKING TEMPERATURES: MINERAL OIL	-20°/+90°C

cod. 051026

Step Bore Master Cylinder SINGLE CIRCUIT Ø38/25 with Open Centre BOOSTER Ø38**CONNECTIONS**

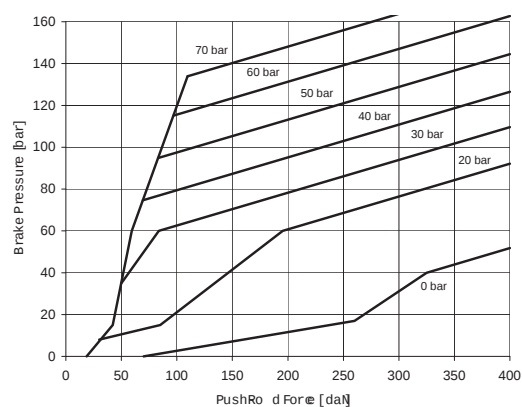
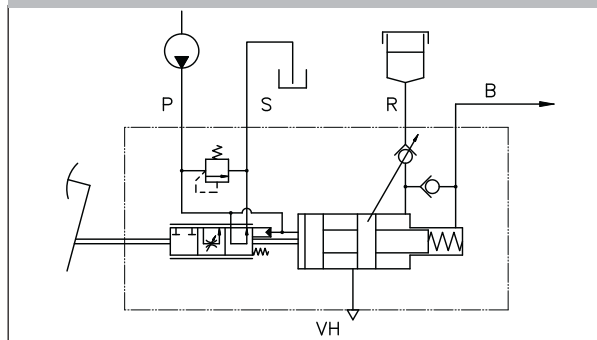
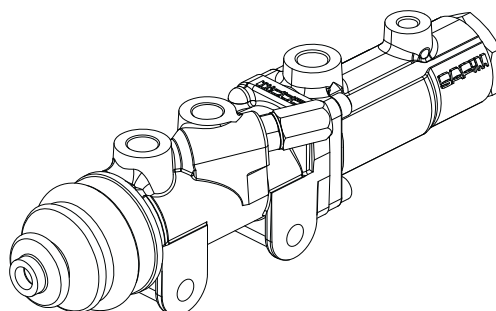
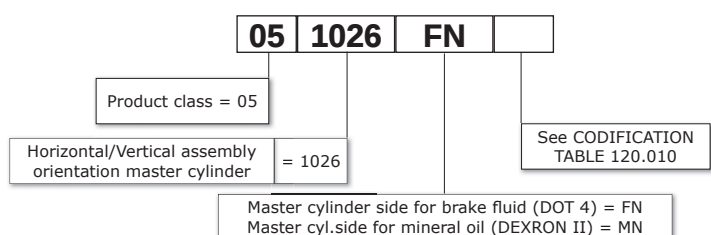
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

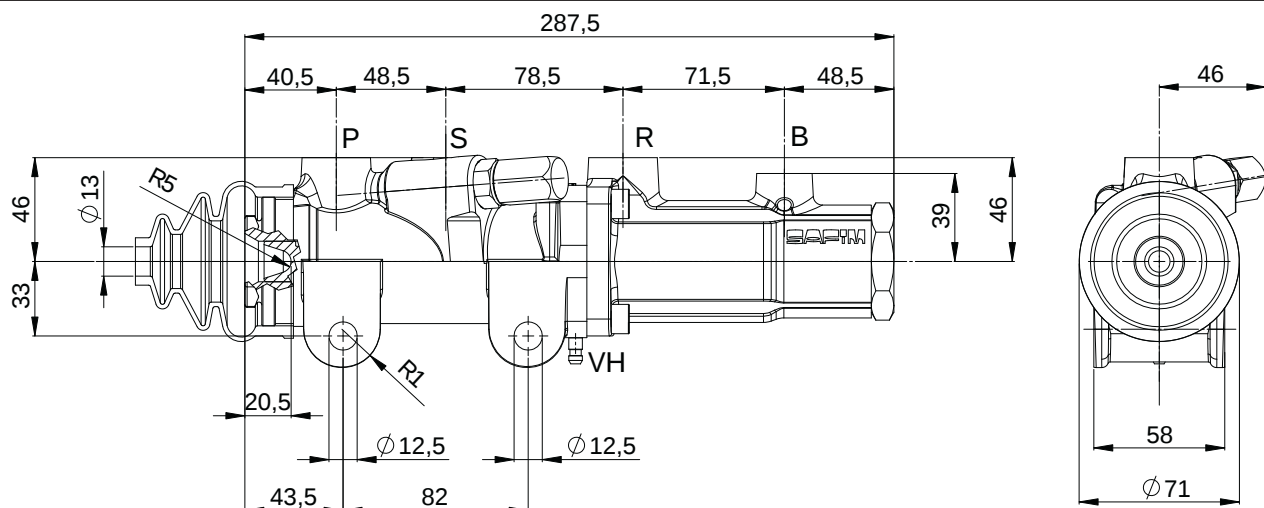
Piston bore	38/25 mm
Displacement	19/44 cm ³
Booster control piston diameter	38 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.18

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 051030**Step Bore Master Cylinder SINGLE CIRCUIT Ø40/30 with
Open Centre BOOSTER Ø40****CONNECTIONS**

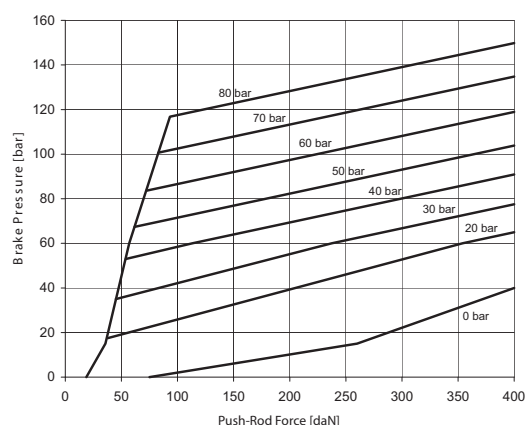
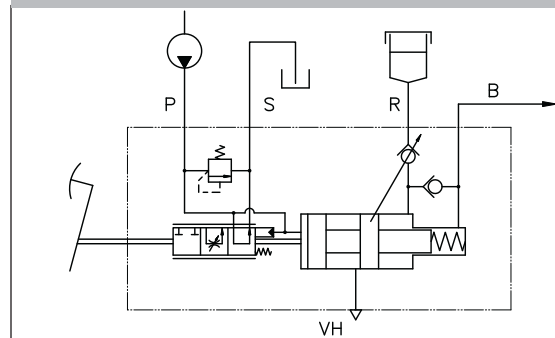
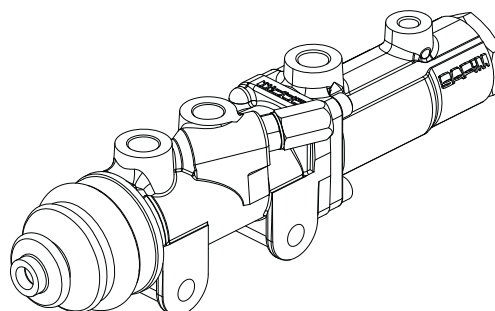
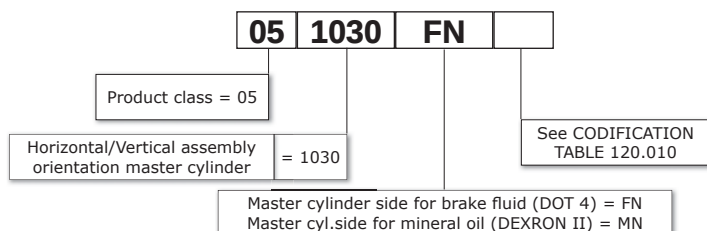
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

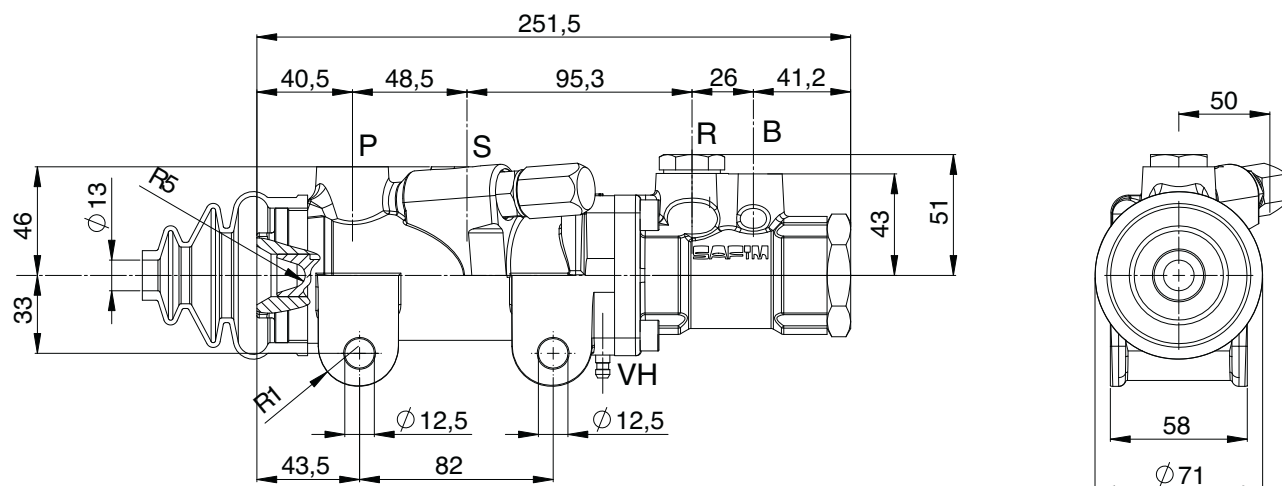
Piston bore	40/30 mm
Displacement	27.5/49 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.64

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 041038 Master Cylinder SINGLE CIRCUIT Ø25 with Open Centre BOOSTER Ø40

CONNECTIONS

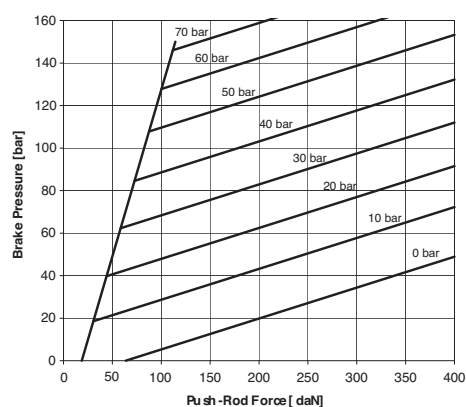
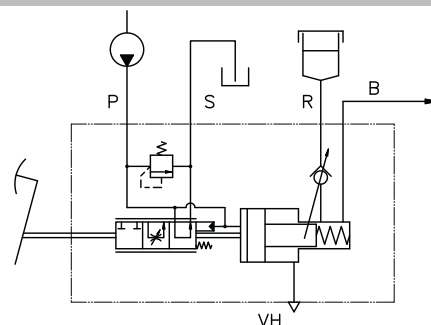
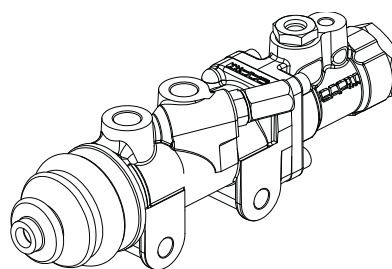
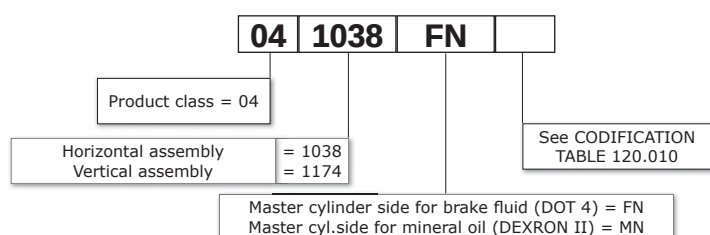
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M10x1.25
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

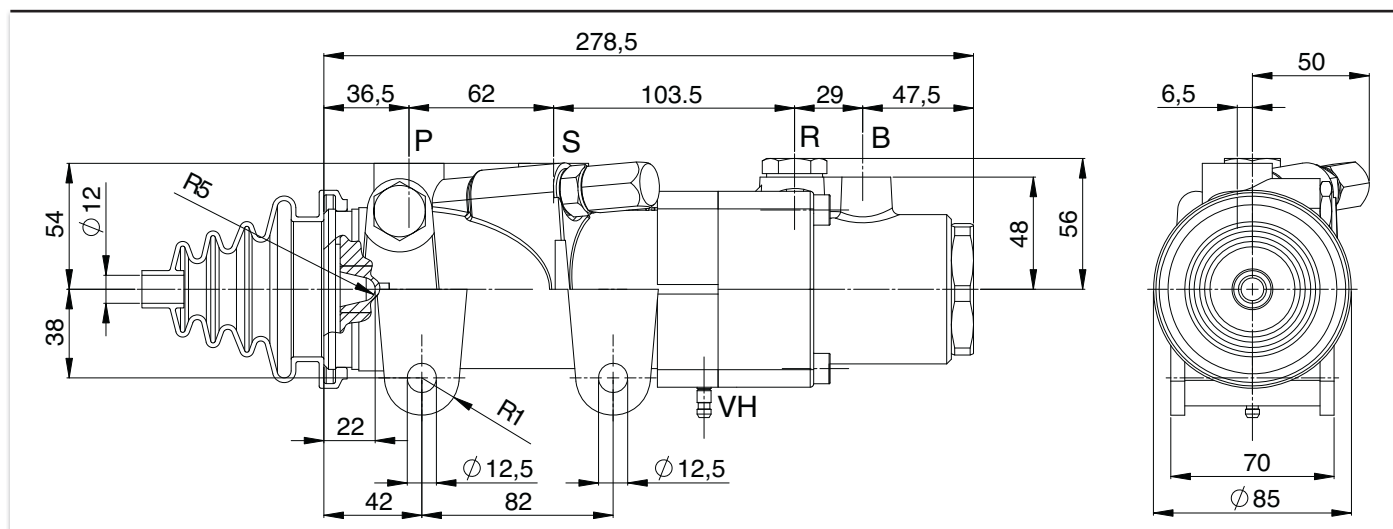
Piston bore	25 mm
Displacement	19 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.36

WORKING CONDITIONS

Booster feeding fluid: hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER


MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 041032**Master Cylinder SINGLE CIRCUIT Ø35 with Open Centre BOOSTER Ø50****CONNECTIONS**

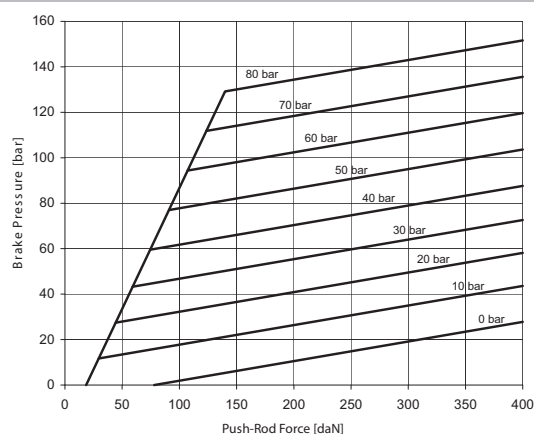
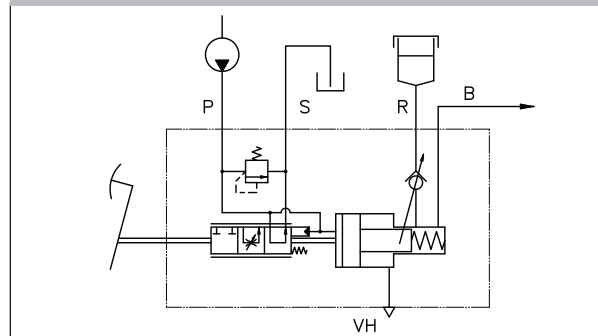
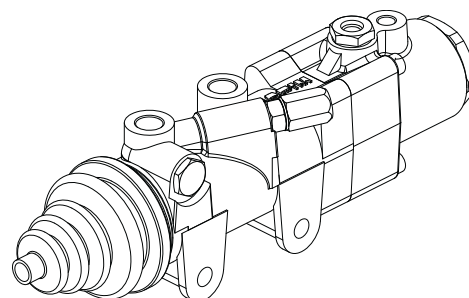
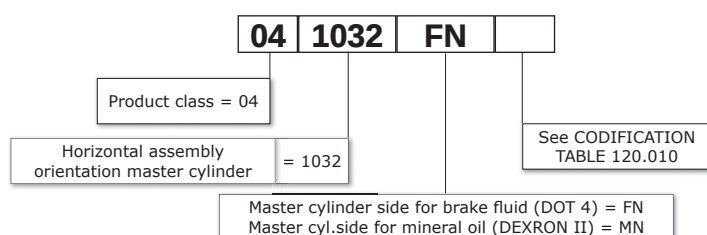
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

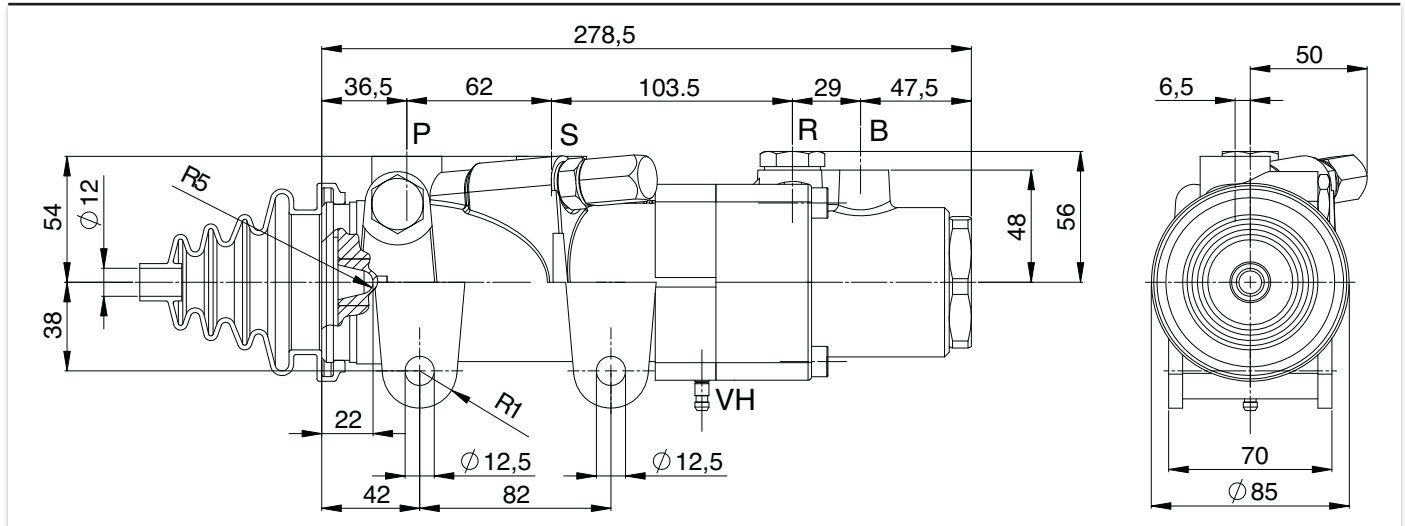
Piston bore	35 mm
Displacement	47 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.94

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 041059 Master Cylinder SINGLE CIRCUIT Ø38 with Open Centre BOOSTER Ø50

CONNECTIONS

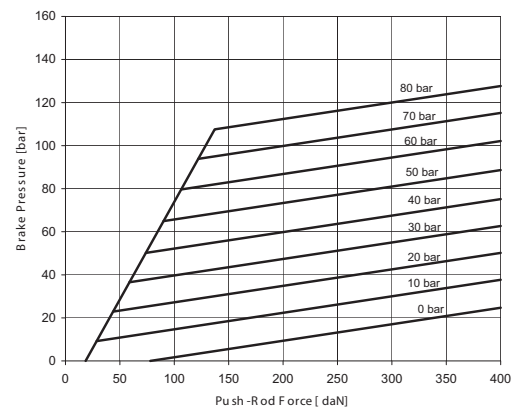
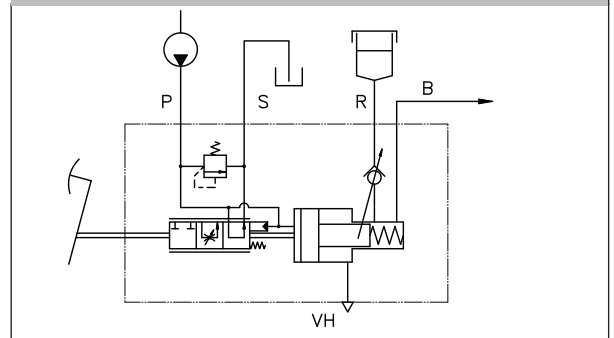
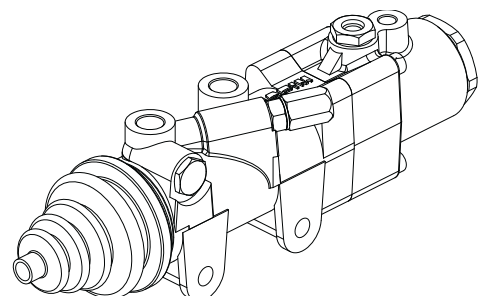
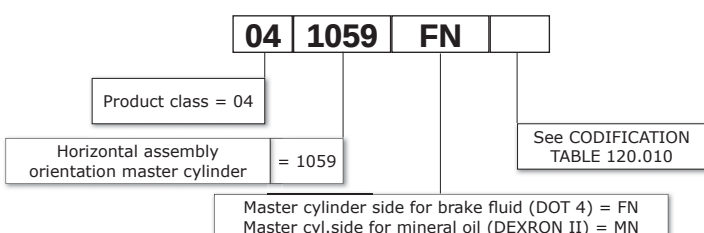
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

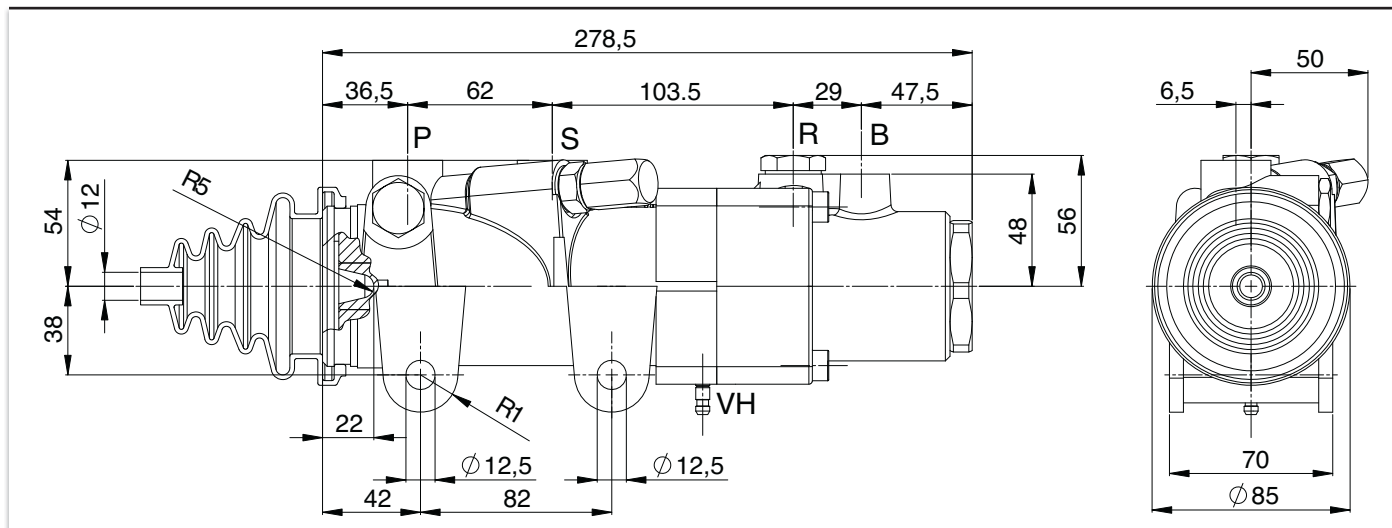
TECHNICAL FEATURES

Piston bore	38 mm
Displacement	55.5 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.64

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER


cod. 042178**Master Cylinder SINGLE CIRCUIT Ø42 with Open Centre BOOSTER Ø50****CONNECTIONS**

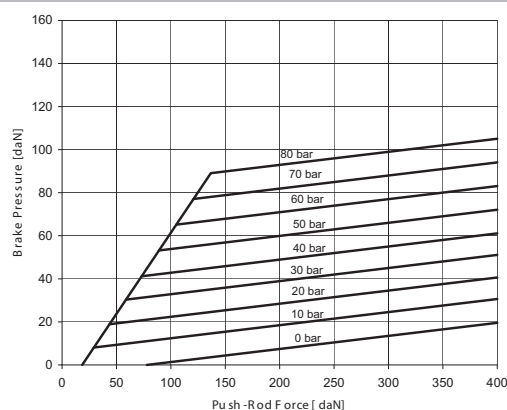
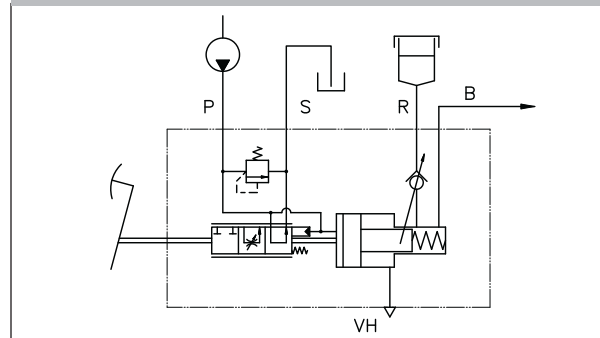
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

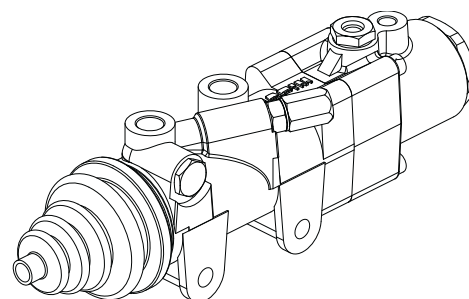
Piston bore	42 mm
Displacement	67 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.34

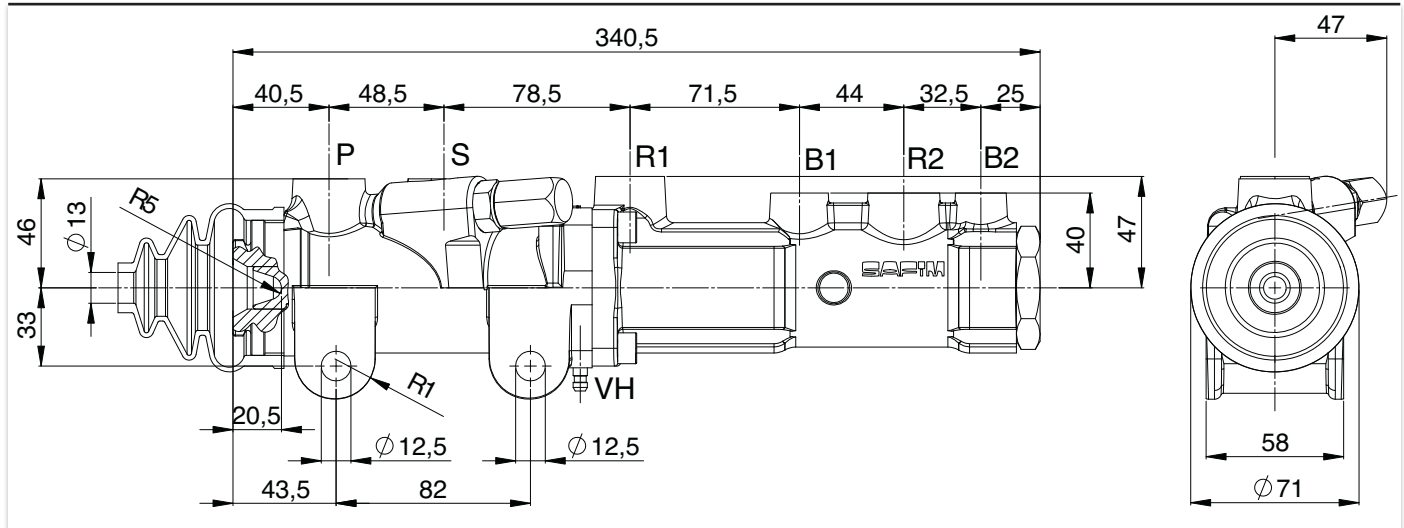
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

04	2178	FN	
Product class = 04			
Horizontal assembly orientation master cylinder	= 2178		See CODIFICATION TABLE 120.010
		Master cylinder side for brake fluid (DOT 4) = FN	
		Master cyl.side for mineral oil (DEXRON II) = MN	

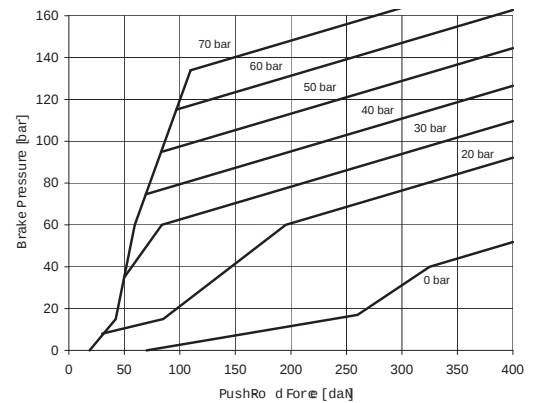
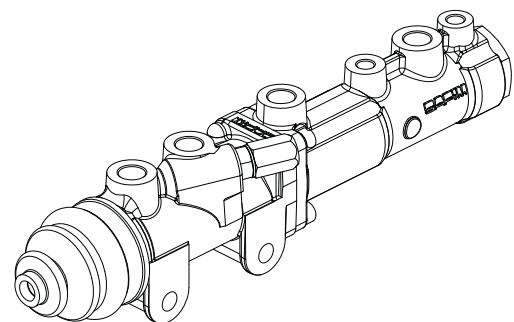
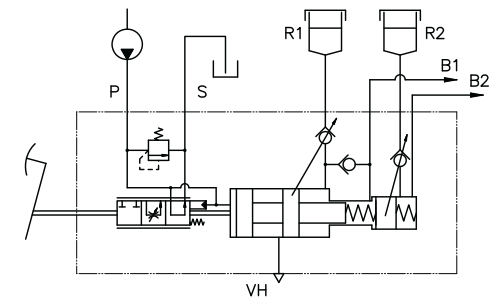


cod. 051028 Step Bore Master Cylinder DUAL CIRCUIT Ø38/25 - Ø31,75 with Open Centre BOOSTER Ø38

CONNECTIONS

P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	38/25 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	5/30 cm ³
2nd circuit displacement	13.5 cm ³
Total displacement	18.5/43.5 cm ³
Booster control piston diameter	38 mm
Push-rod stroke	42 mm
1st circuit stroke	22 mm
2nd circuit stroke	18 mm
Ratio between 1st circuit and booster area	2.18
Ratio between 2nd circuit and booster area	1.31

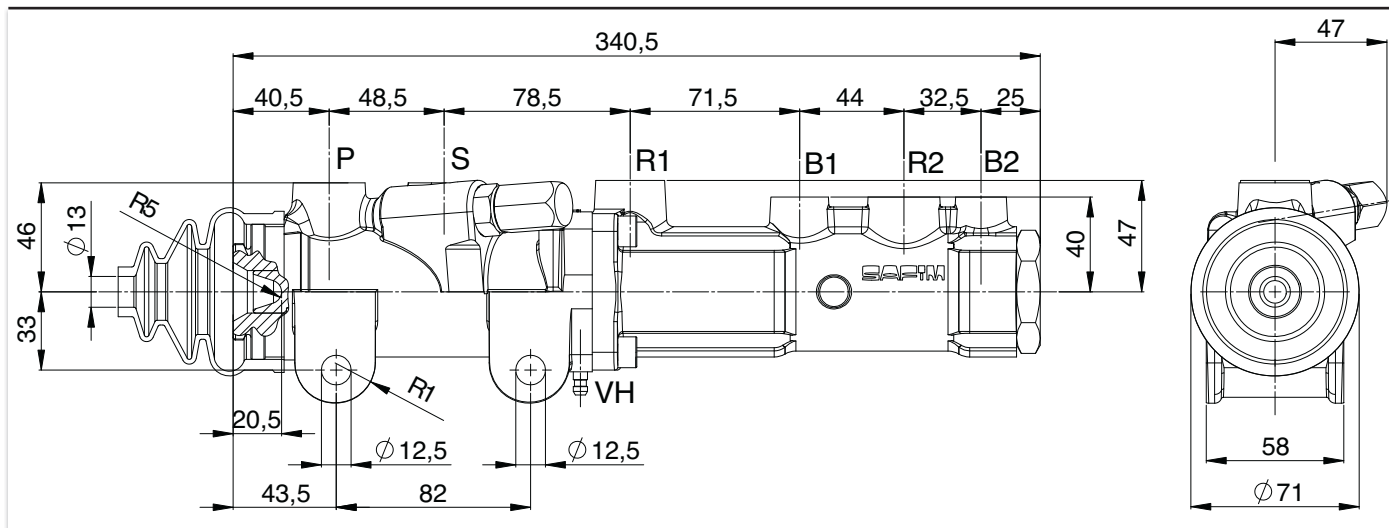
FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5 ÷ 15 l/min

ORDER PART NUMBER

05	1028	FN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1028		See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 051022**Step Bore Master Cylinder DUAL CIRCUIT Ø40/30 - Ø35 with Open Centre BOOSTER Ø40****CONNECTIONS**

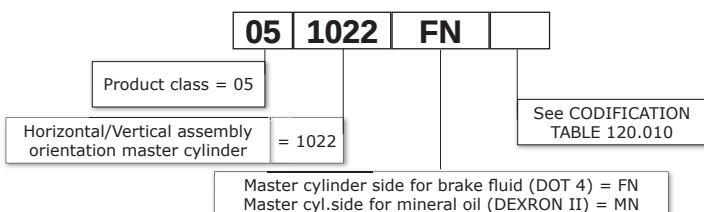
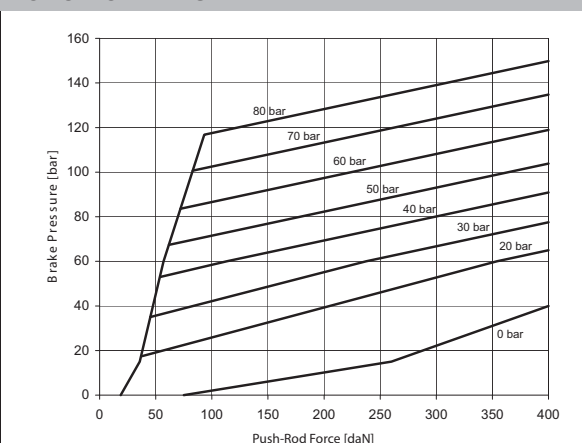
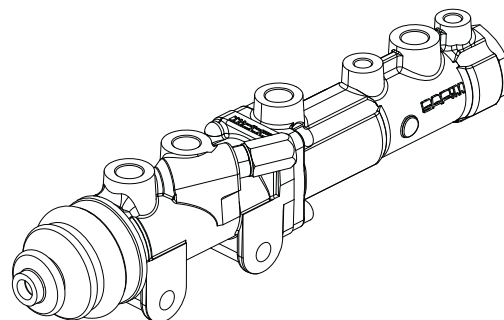
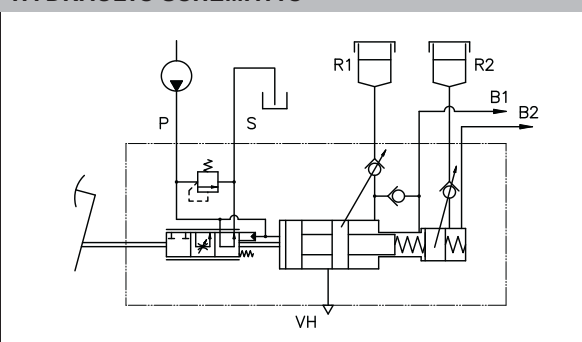
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

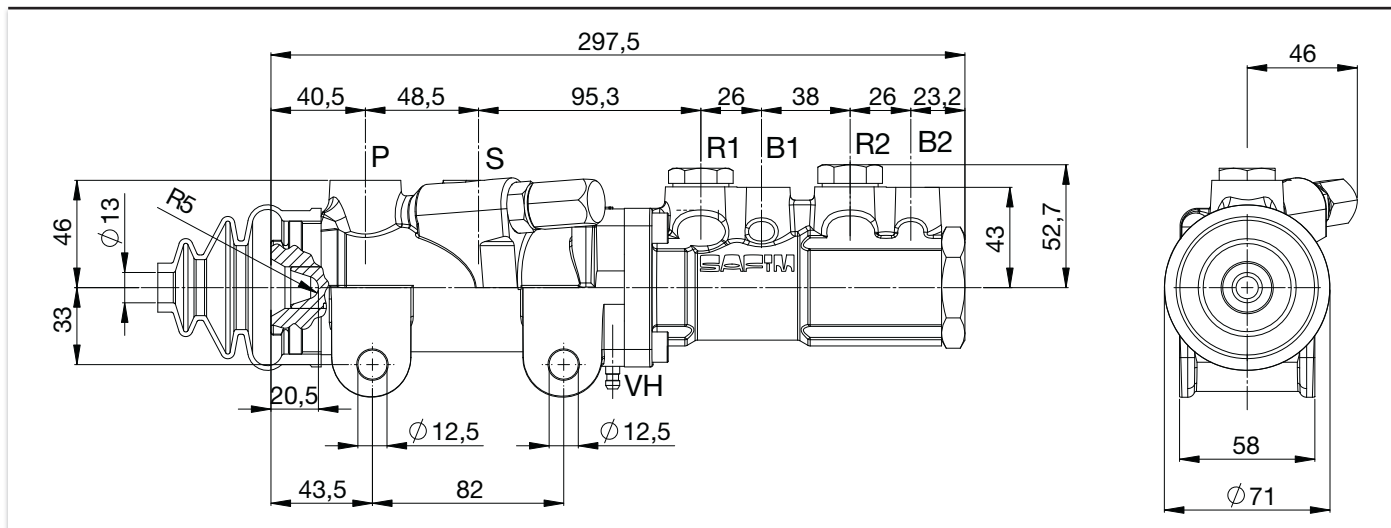
1st circuit piston diameter	40/30 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	8.5/30 cm ³
2nd circuit displacement	18 cm ³
Total displacement	26.5/48 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.64
Ratio between 2nd circuit and booster area	1.2

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

ORDER PART NUMBER**FUNCTION DIAGRAM****HYDRAULIC SCHEMATIC**

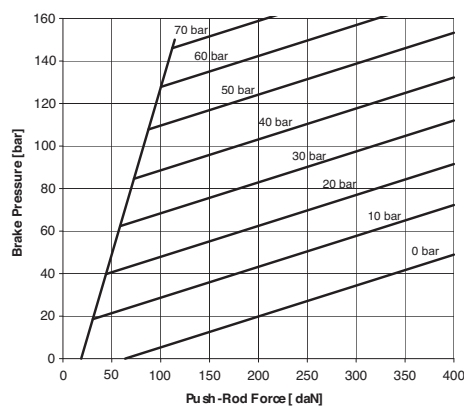
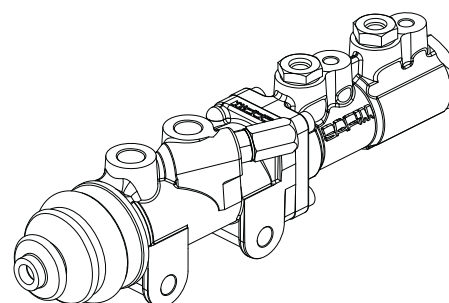
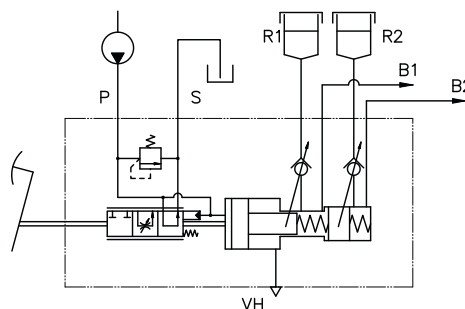
MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 041037 Master Cylinder DUAL CIRCUIT Ø25 - Ø29 with Open Centre BOOSTER Ø40

CONNECTIONS

P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M10x1.25
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M10x1.25
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	25 mm
2nd circuit piston diameter	29 mm
1st circuit displacement	9 cm ³
2nd circuit displacement	9.5 cm ³
Total displacement	18.5 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	24.5 mm
2nd circuit stroke	15.5 mm
Ratio between 1st circuit and booster area	2.36
Ratio between 2nd circuit and booster area	1.75

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

WORKING CONDITIONS

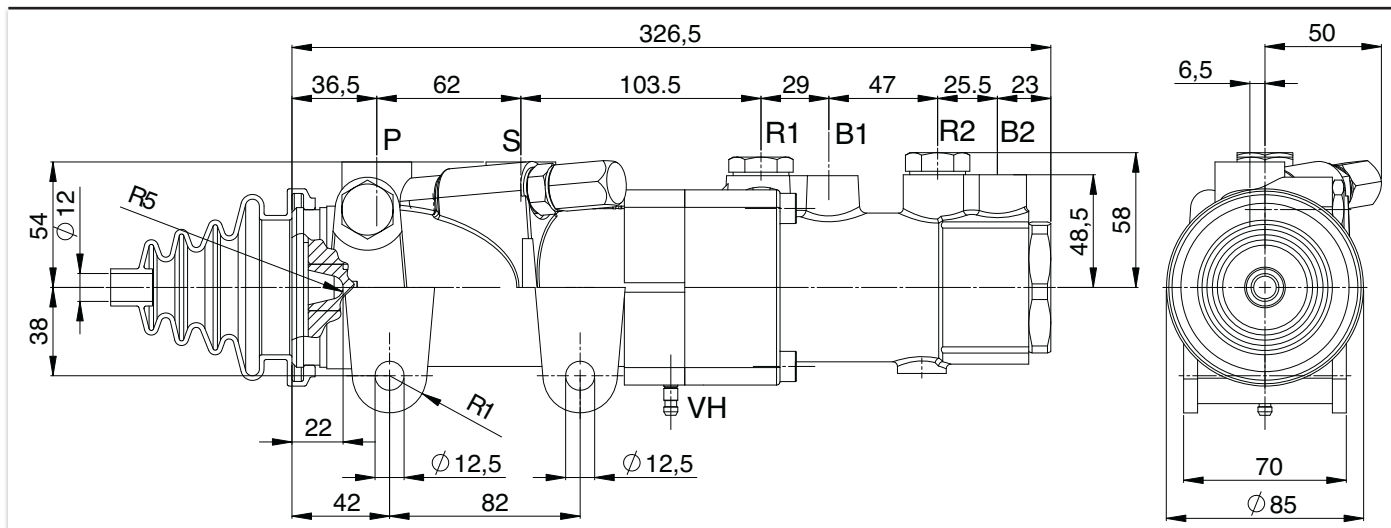
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5 ÷ 15 l/min

ORDER PART NUMBER

04	1037	FN	
Product class = 04			
Horizontal assembly Vertical assembly	= 1037 = 1094		See CODIFICATION TABLE 120.010
		Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN	

MNO and FNO versions can be assembled on pedal 021678, see page 110.010

cod. 041031

Master Cylinder DUAL CIRCUIT Ø35 – Ø39 with Open Centre BOOSTER Ø50**CONNECTIONS**

P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

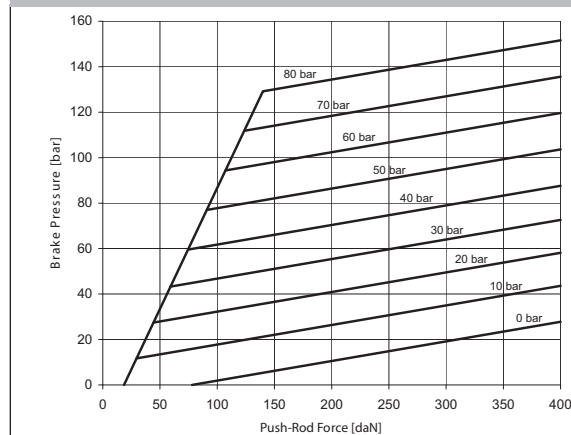
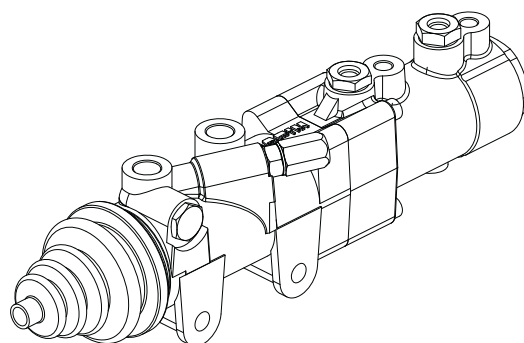
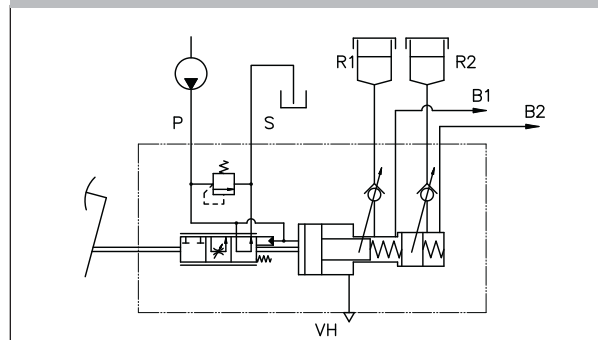
1st circuit piston diameter	35 mm
2nd circuit piston diameter	39 mm
1st circuit displacement	22.5 cm ³
2nd circuit displacement	23.5 cm ³
Total displacement	46 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	29.5 mm
2nd circuit stroke	20.5 mm
Ratio between 1st circuit and booster area	1.94
Ratio between 2nd circuit and booster area	1.56

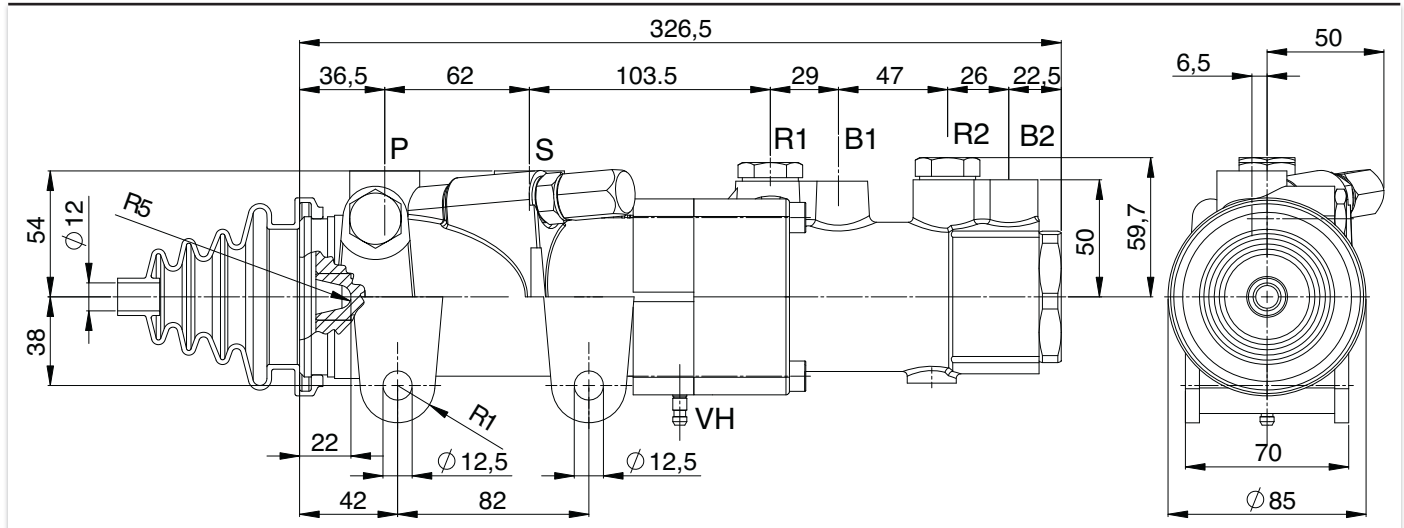
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

ORDER PART NUMBER

04	1031	FN	
Product class = 04			
Horizontal assembly orientation master cylinder = 1031			
See CODIFICATION TABLE 120.010			
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

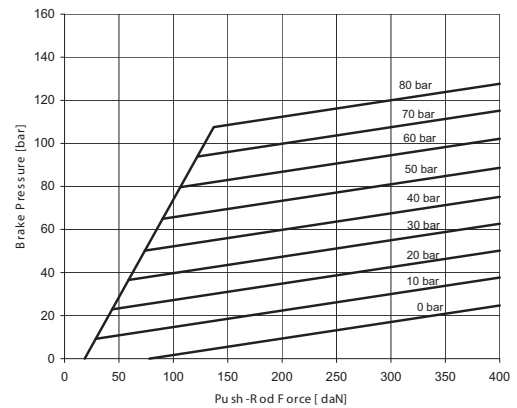
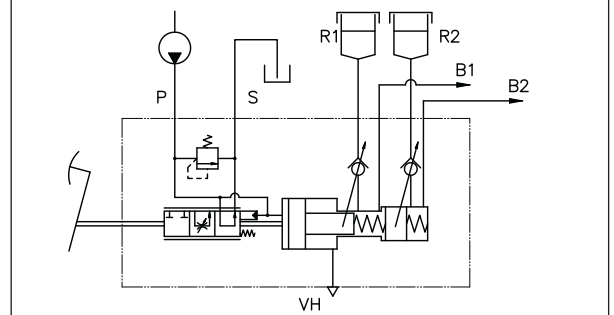
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC**

cod. 041044 Master Cylinder DUAL CIRCUIT Ø38 – Ø42 with Open Centre BOOSTER Ø50

CONNECTIONS

P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

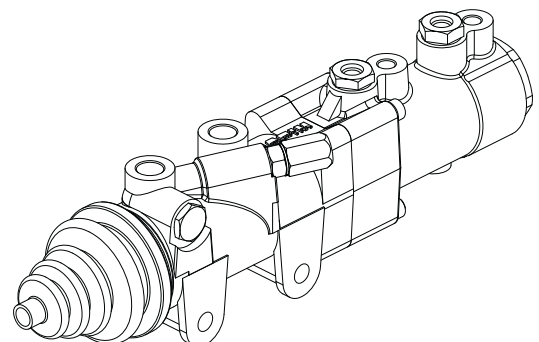
1st circuit piston diameter	38 mm
2nd circuit piston diameter	42 mm
1st circuit displacement	27 cm ³
2nd circuit displacement	27 cm ³
Total displacement	54 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	29.5 mm
2nd circuit stroke	20.5 mm
Ratio between 1st circuit and booster area	1.64
Ratio between 2nd circuit and booster area	1.35

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

WORKING CONDITIONS

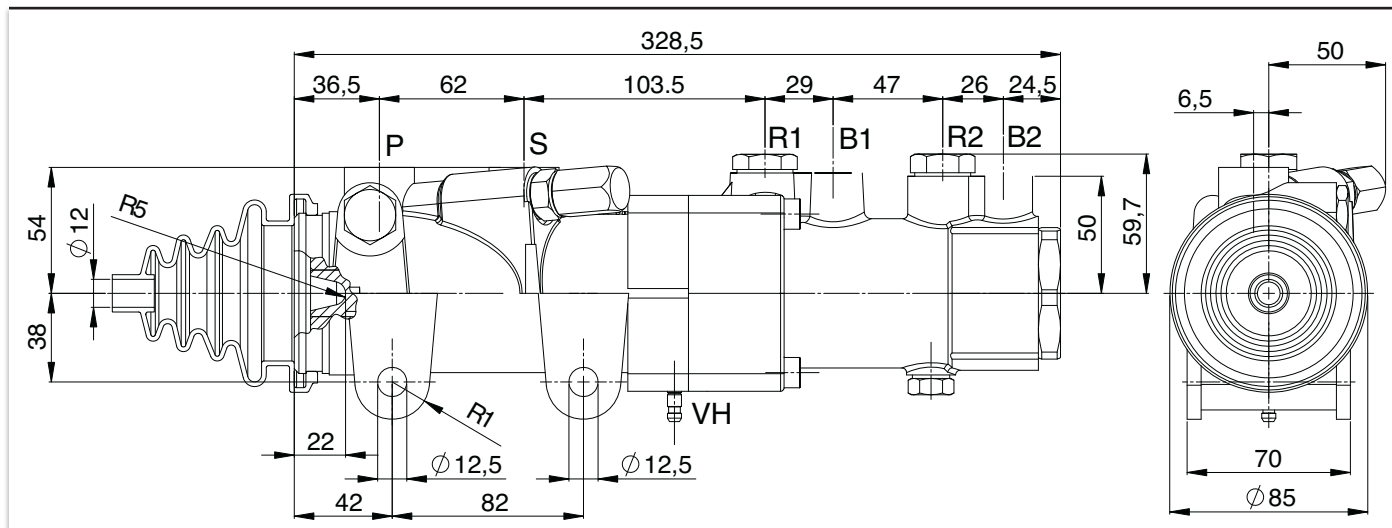
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

ORDER PART NUMBER

04	1044	FN	
Product class = 04			
Horizontal assembly orientation master cylinder	= 1044		See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			



cod. 041145

Master Cylinder DUAL CIRCUIT Ø42 – Ø46 with Open Centre BOOSTER Ø50**CONNECTIONS**

P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M14x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M14x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

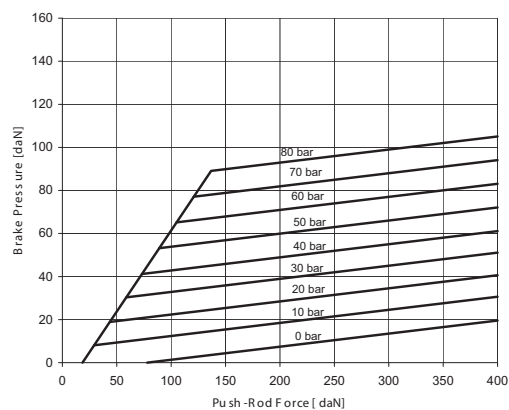
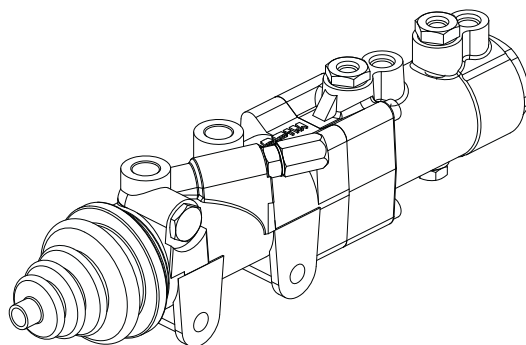
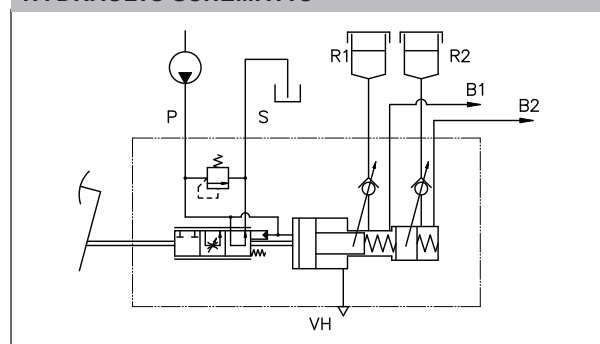
1st circuit piston diameter	42 mm
2nd circuit piston diameter	46 mm
1st circuit displacement	30 cm ³
2nd circuit displacement	35 cm ³
Total displacement	65 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	27.5 mm
2nd circuit stroke	22.5 mm
Ratio between 1st circuit and booster area	1.34
Ratio between 2nd circuit and booster area	1.12

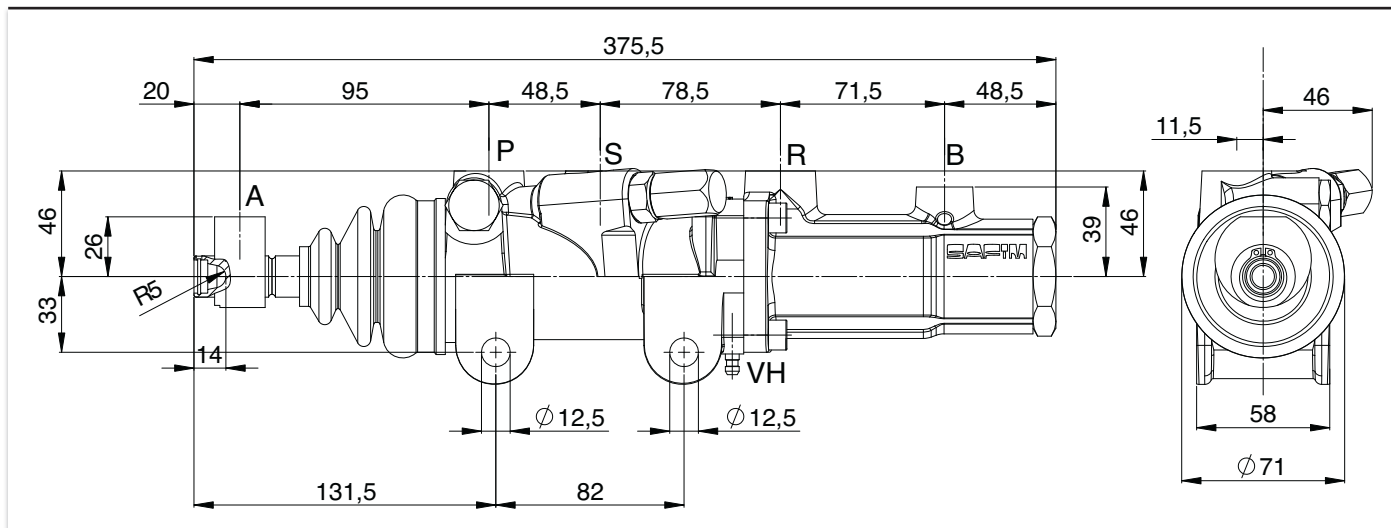
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

ORDER PART NUMBER

04	1145	FN	
Product class = 04			
Horizontal assembly orientation master cylinde			
= 1145			
See CODIFICATION TABLE 120.010			
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

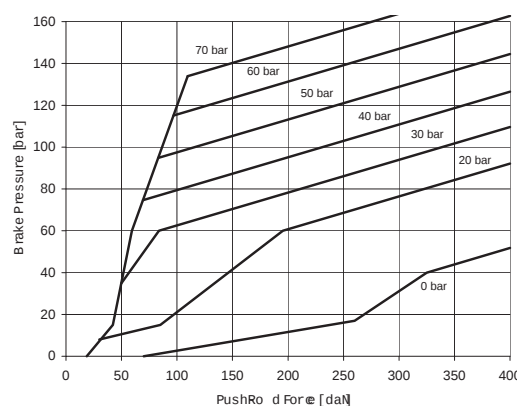
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC**

cod. 051793 Step Bore Master Cylinder SINGLE CIRCUIT Ø38/25 with Open Centre BOOSTER Ø38 with Accumulator

CONNECTIONS

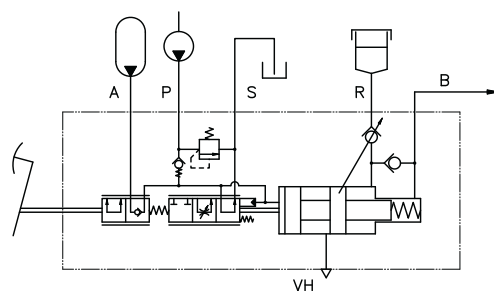
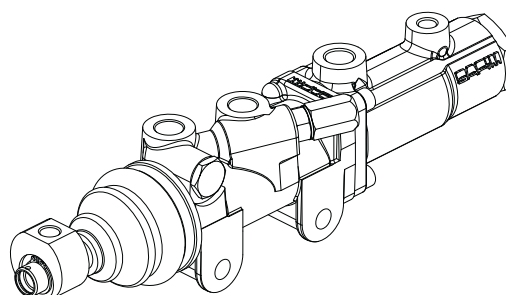
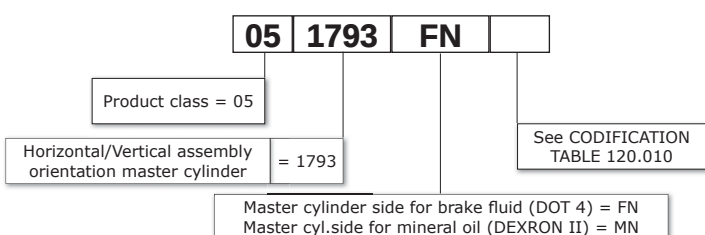
A	Accumulator port	¼" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

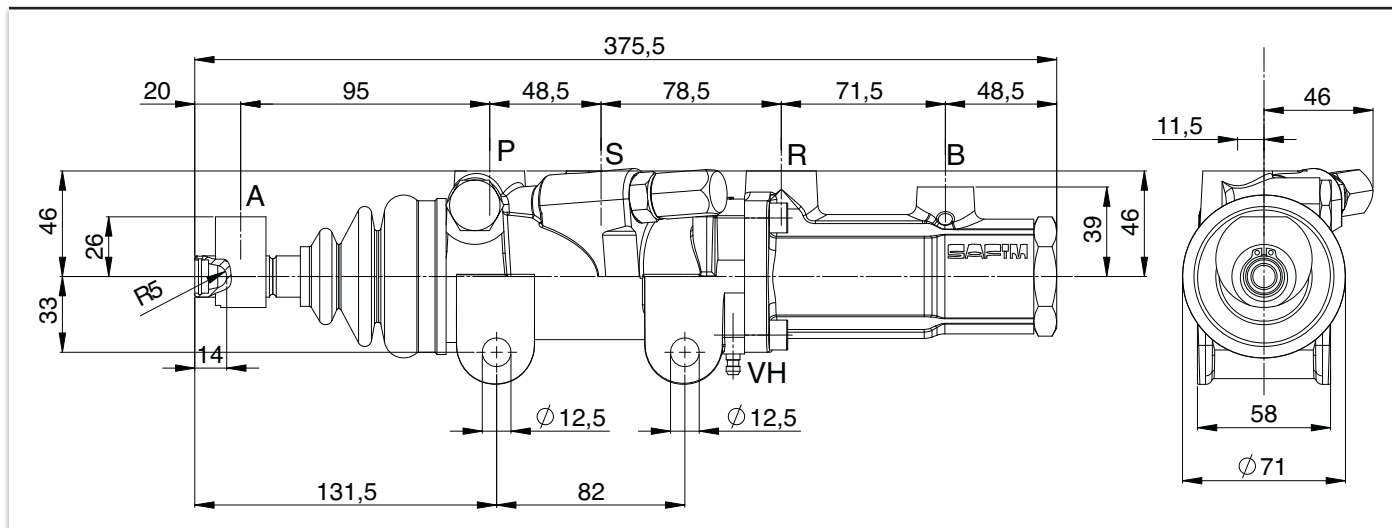
Piston diameter	38/25 mm
Displacement	19/44 cm ³
Booster control piston diameter	38 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.18

FUNCTION DIAGRAM

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

HYDRAULIC SCHEMATIC

ORDER PART NUMBER


MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 051792**Step Bore Master Cylinder SINGLE CIRCUIT Ø40/30 with
Open Centre BOOSTER Ø40 with Accumulator****CONNECTIONS**

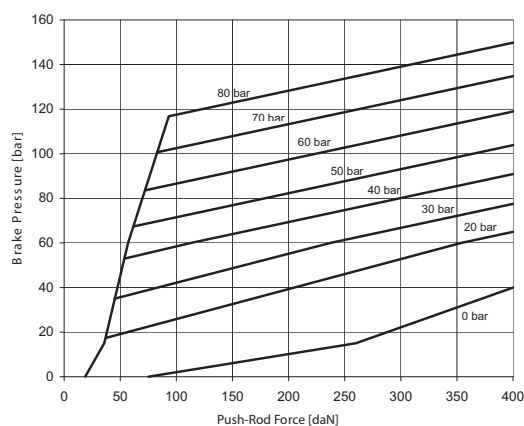
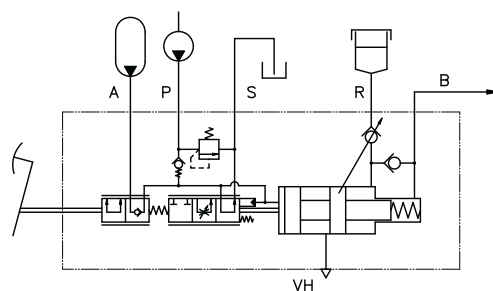
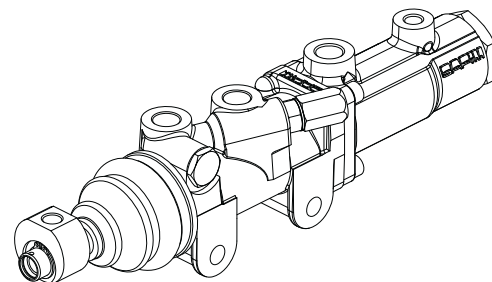
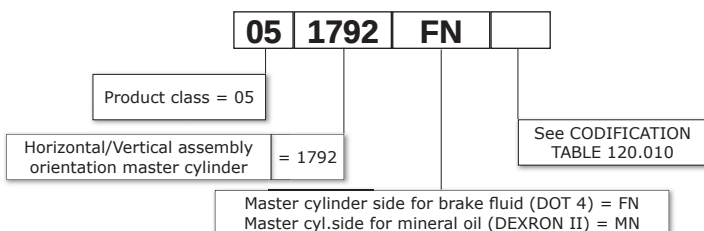
A	Accumulator port	1/4" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

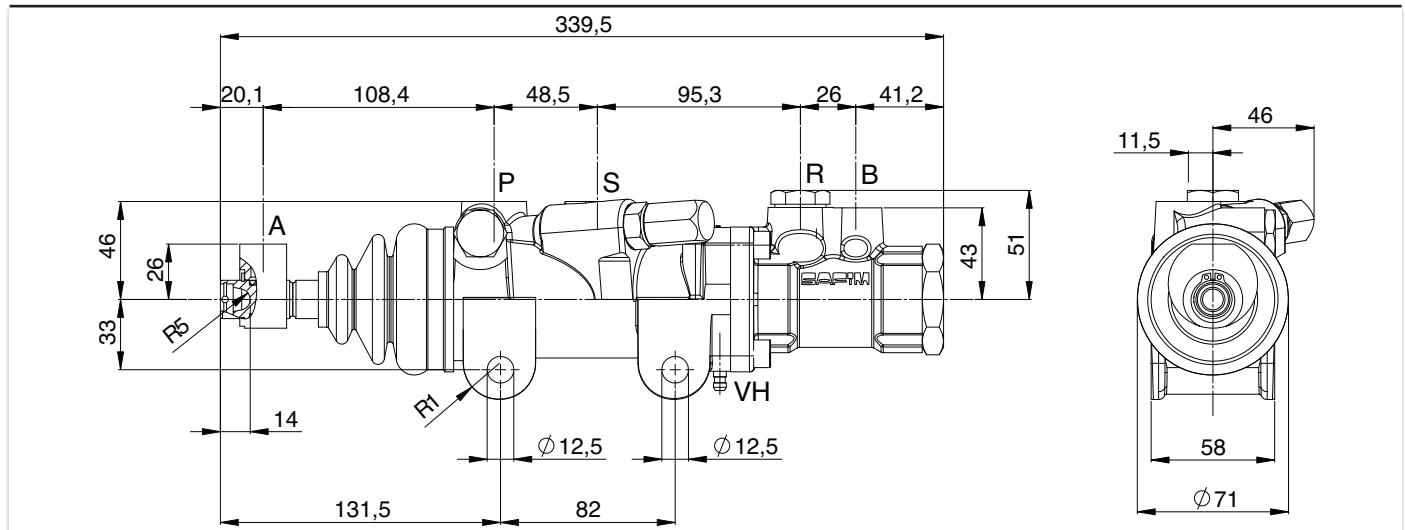
Piston diameter	40/30 mm
Displacement	27.5/49 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.64

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

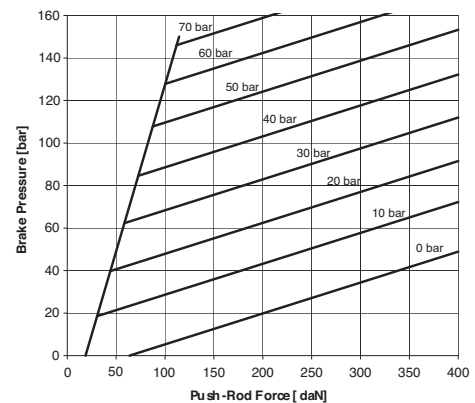
MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 041794**Master Cylinder SINGLE CIRCUIT Ø25 with Open Centre
BOOSTER Ø40 with Accumulator****CONNECTIONS**

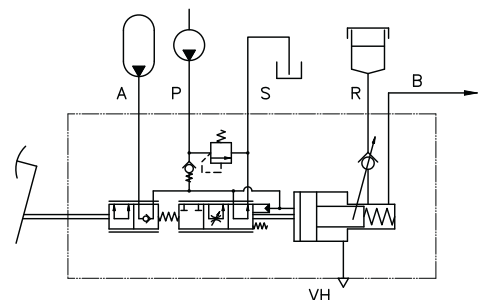
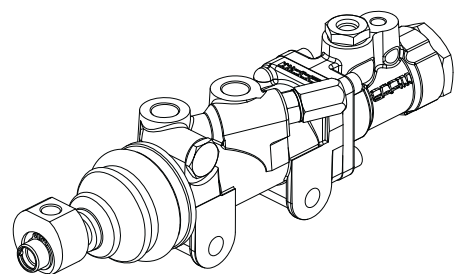
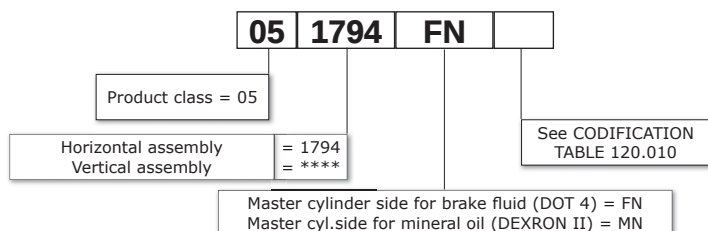
A	Accumulator port	¼" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M10x1.25
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

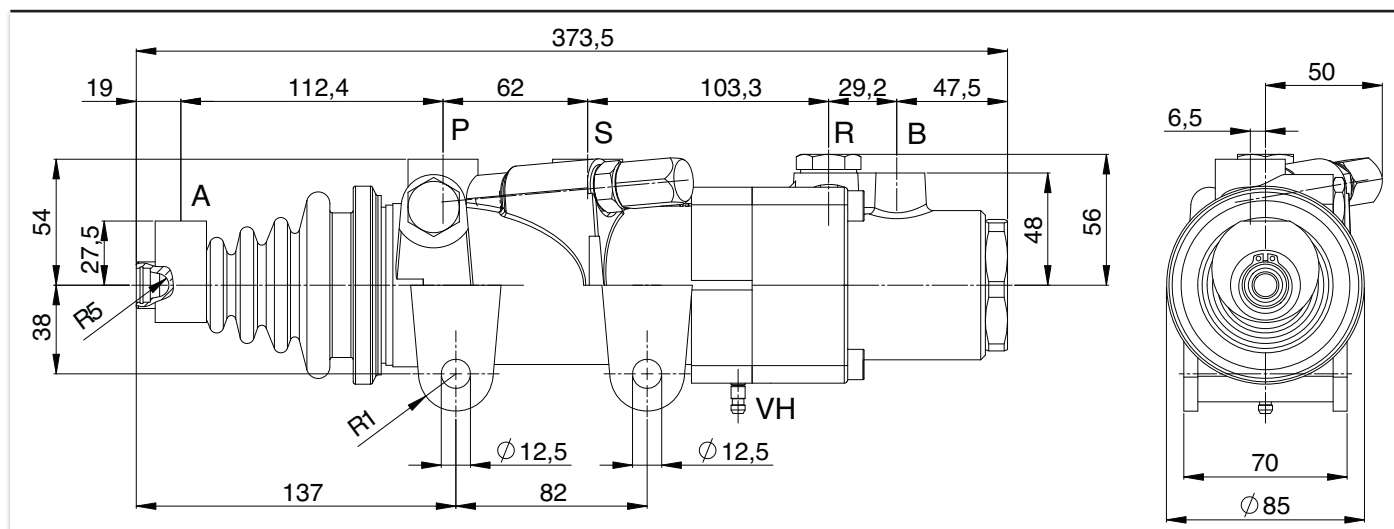
Piston diameter	25 mm
Displacement	19 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.36

FUNCTION DIAGRAM**WORKING CONDITIONS**

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

HYDRAULIC SCHEMATIC**ORDER PART NUMBER**

MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 041791**Master Cylinder SINGLE CIRCUIT Ø35 with Open Centre
BOOSTER Ø50 with Accumulator****CONNECTIONS**

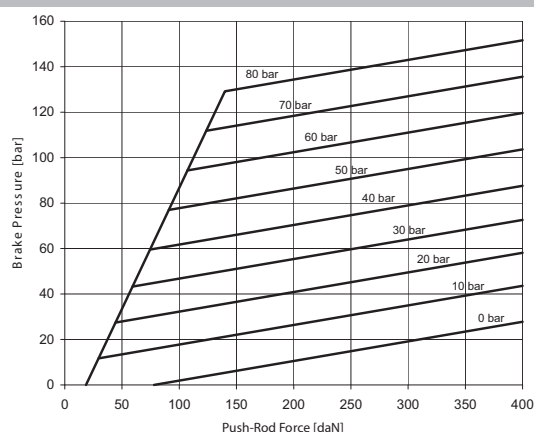
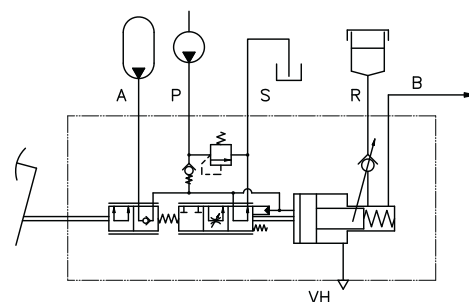
A	Accumulator port	1/4" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

Piston diameter	35 mm
Displacement	47 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.94

WORKING CONDITIONS

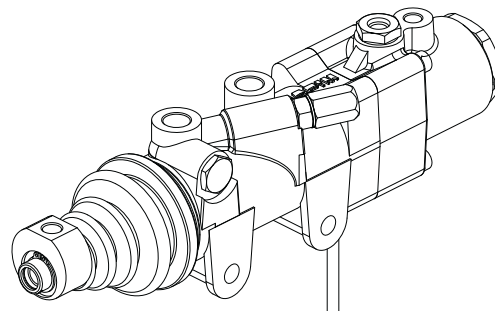
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER****04 1791 FN**

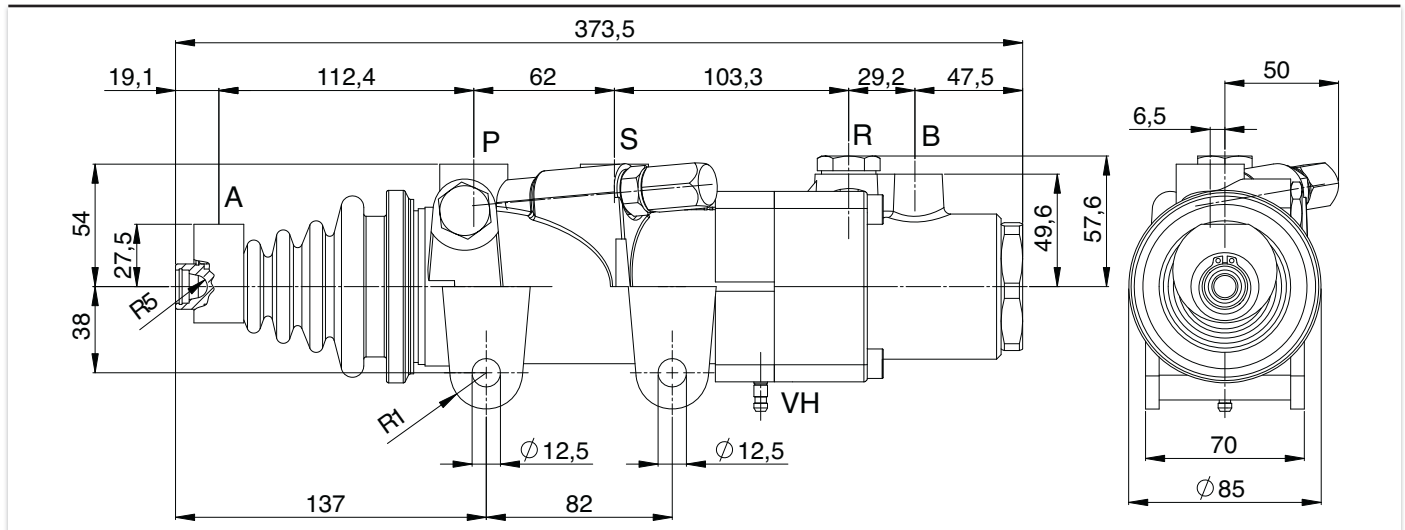
Product class = 04

Horizontal assembly
orientation master cylinde

= 1791

See CODIFICATION
TABLE 120.010Master cylinder side for brake fluid (DOT 4) = FN
Master cyl.side for mineral oil (DEXRON II) = MN

Master Cylinder SINGLE CIRCUIT Ø38 with Open Centre BOOSTER Ø50 with Accumulator



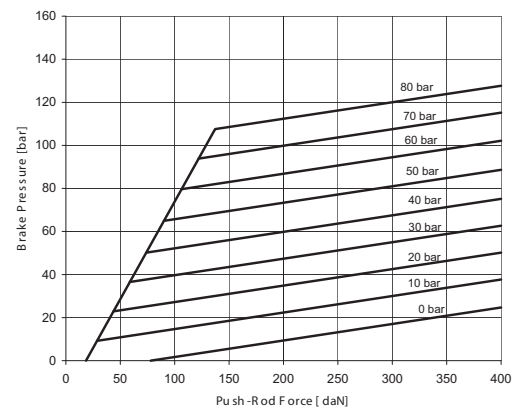
CONNECTIONS

A	Accumulator port	¼" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

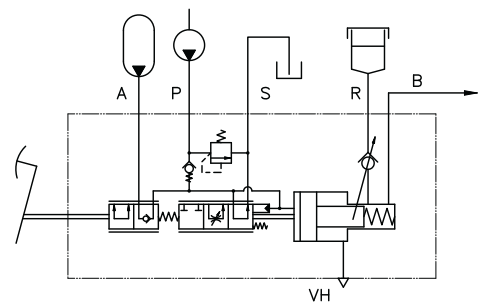
TECHNICAL FEATURES

Piston diameter	38 mm
Displacement	55.5 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.64

FUNCTION DIAGRAM

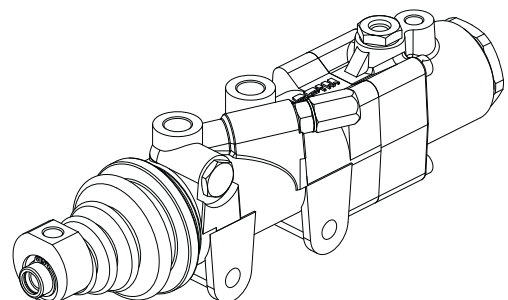


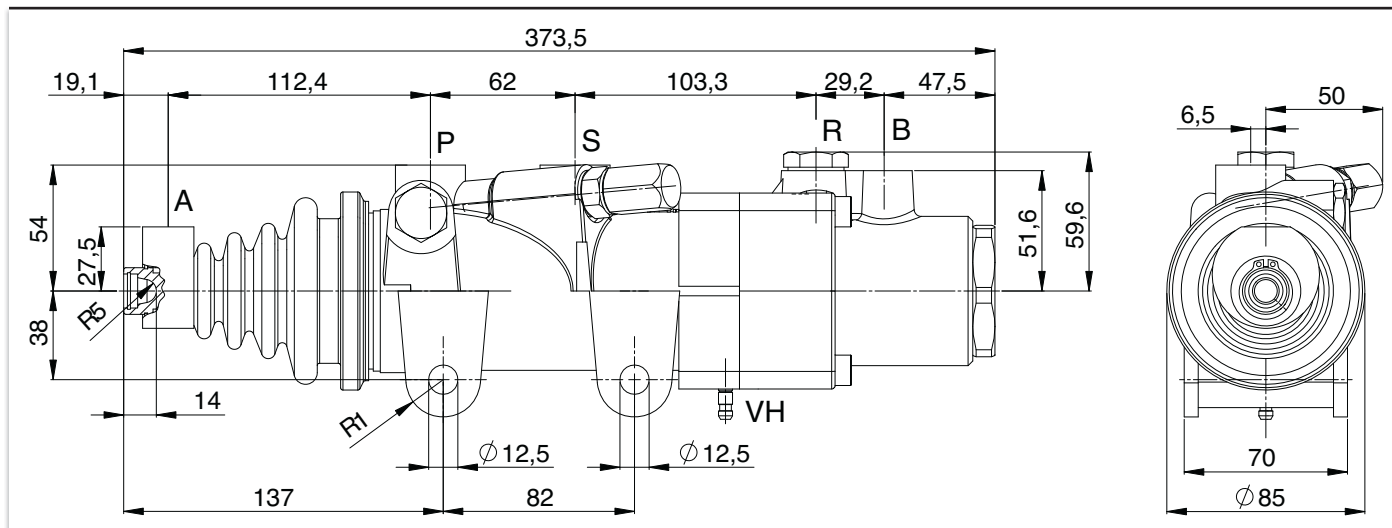
HYDRAULIC SCHEMATIC



ORDER PART NUMBER

04		1786		FN		
Product class = 04						
Horizontal assembly orientation master cylinde		= 1786				See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN						



cod. 042173**Master Cylinder SINGLE CIRCUIT Ø42 with Open Centre
BOOSTER Ø50 with Accumulator****CONNECTIONS**

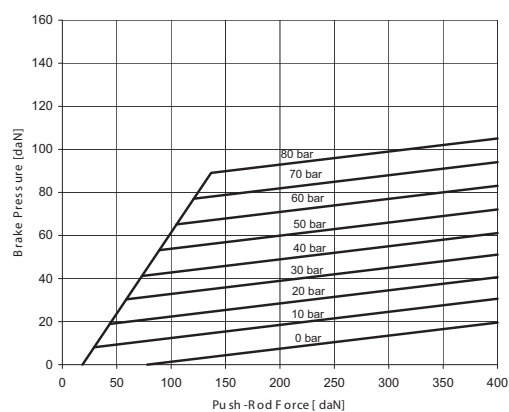
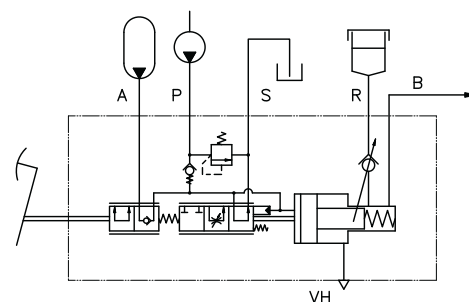
A	Accumulator port	1/4" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M14x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

Piston diameter	42 mm
Displacement	67 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.34

WORKING CONDITIONS

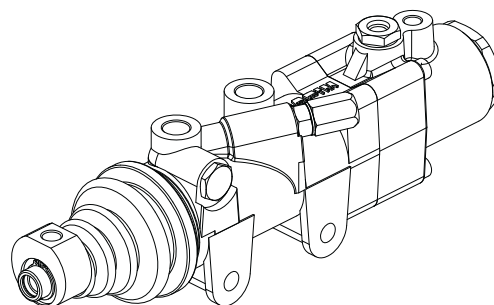
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

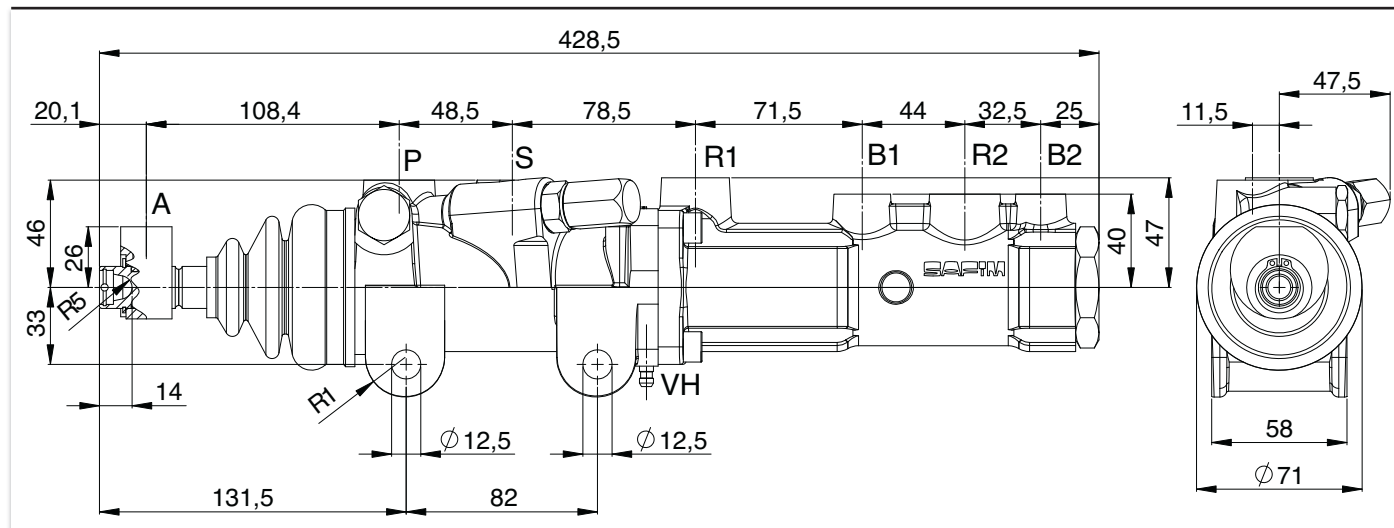
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER****04 2173 FN**

Product class = 04

Horizontal assembly
orientation master cylinde

= 2173

See CODIFICATION
TABLE 120.010Master cylinder side for brake fluid (DOT 4) = FN
Master cyl.side for mineral oil (DEXRON II) = MN

cod. 051789 Step Bore Master Cylinder DUAL CIRCUIT Ø38/25 - Ø31,75 with Open Centre BOOSTER Ø38 with Accumulator

CONNECTIONS

A	Accumulator port	¼" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	38/25 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	5/30 cm ³
2nd circuit displacement	13.5 cm ³
Total displacement	18.5/43.5 cm ³
Booster control piston diameter	38 mm
Push-rod stroke	42 mm
1st circuit stroke	22 mm
2nd circuit stroke	18 mm
Ratio between 1st circuit and booster area	2.18
Ratio between 2nd circuit and booster area	1.31

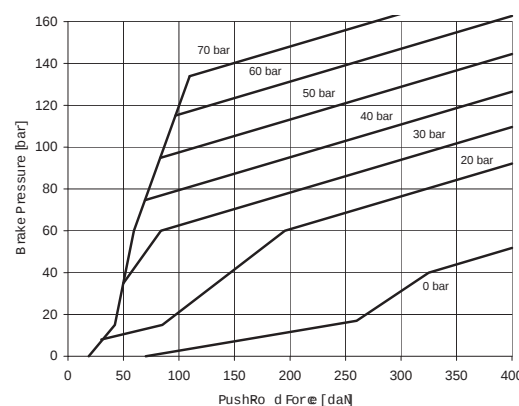
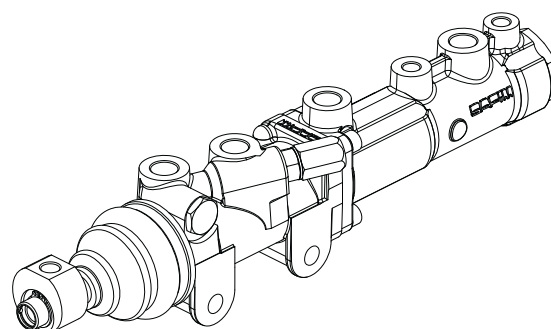
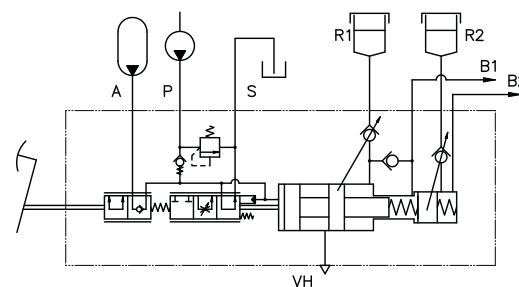
WORKING CONDITIONS

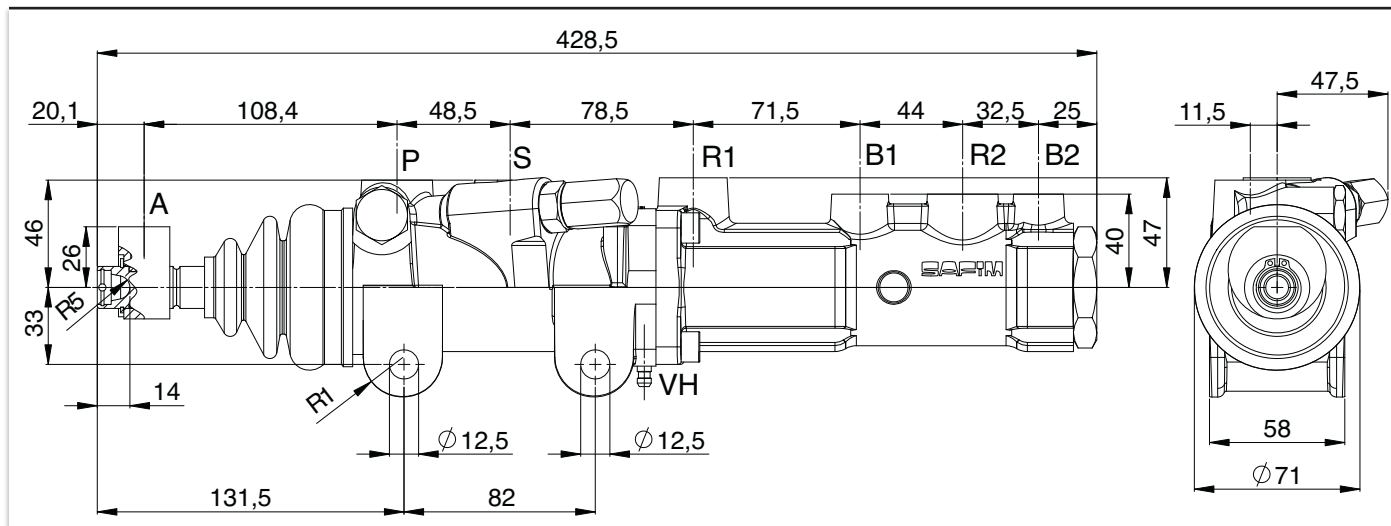
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

ORDER PART NUMBER

05	1789	FN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1789		See CODIFICATION TABLE 120.010
		Master cylinder side for brake fluid (DOT 4) = FN	
		Master cyl.side for mineral oil (DEXRON II) = MN	

MNR and FNR versions can be assembled on pedal 022193, see page 110.010

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC


cod. 051788**Step Bore Master Cylinder DUAL CIRCUIT Ø40/30 - Ø35 with Open Centre BOOSTER Ø40 with Accumulator****CONNECTIONS**

A	Accumulator port	1/4" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

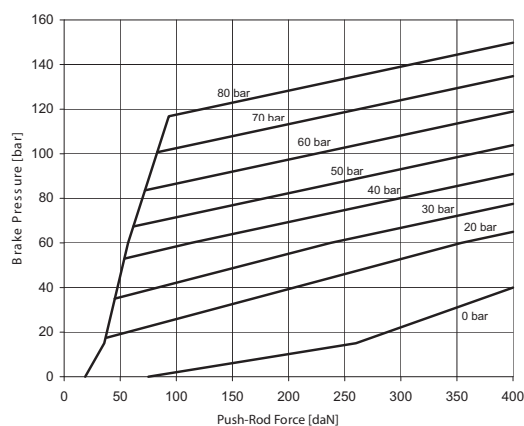
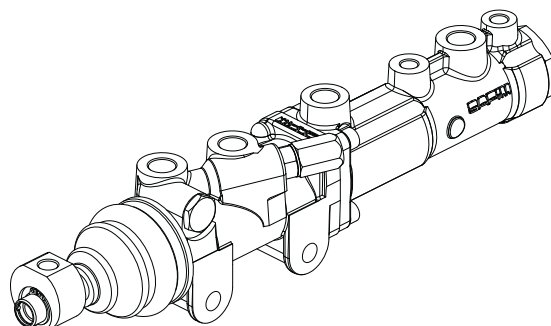
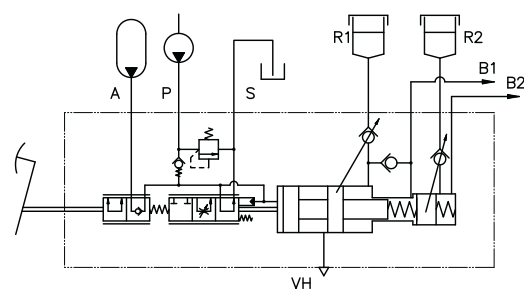
1st circuit piston diameter	40/30 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	8.5/30 cm ³
2nd circuit displacement	18 cm ³
Total displacement	26.5/48 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.64
Ratio between 2nd circuit and booster area	1.2

WORKING CONDITIONS

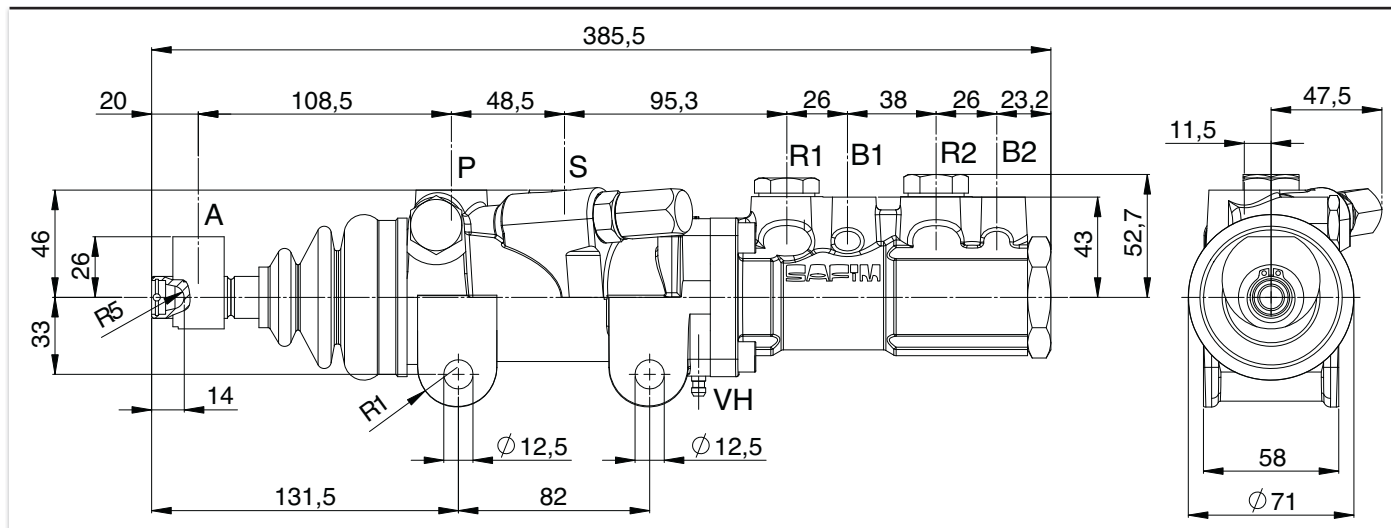
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5÷15 l/min

ORDER PART NUMBER

05	1788	FN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1788		See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC**

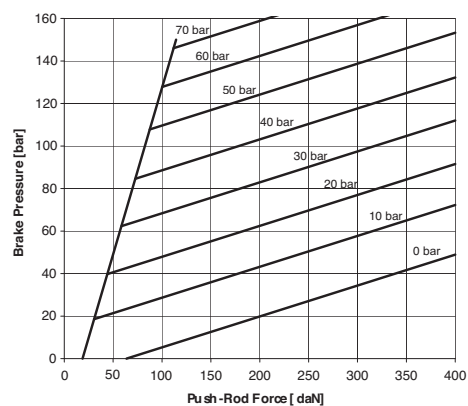
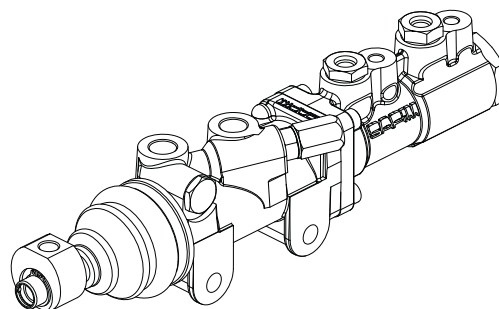
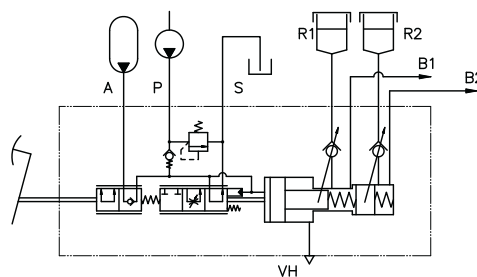
MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 041790**Master Cylinder DUAL CIRCUIT Ø25 - Ø29 with Open Centre BOOSTER Ø40 with Accumulator****CONNECTIONS**

A	Accumulator port	¼" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M10x1.25
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M10x1.25
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	25 mm
2nd circuit piston diameter	29 mm
1st circuit displacement	9 cm ³
2nd circuit displacement	9.5 cm ³
Total displacement	18.5 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	24.5 mm
2nd circuit stroke	15.5 mm
Ratio between 1st circuit and booster area	2.36
Ratio between 2nd circuit and booster area	1.75

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****WORKING CONDITIONS**

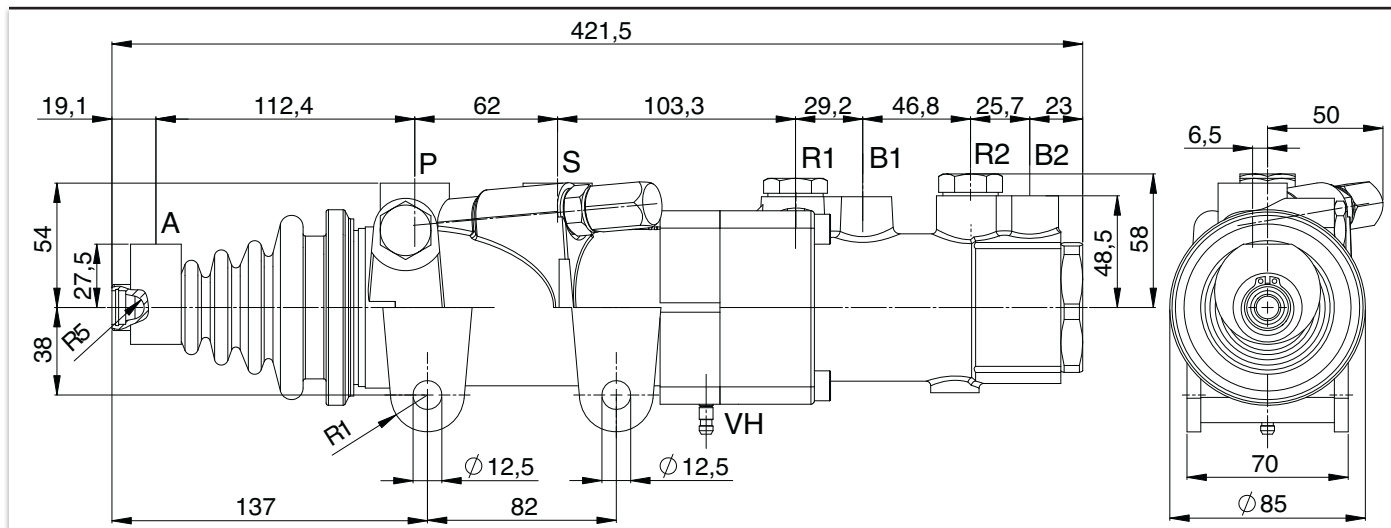
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	3.5 ÷ 15 l/min

ORDER PART NUMBER**04 1790 FN**

Product class = 04

Horizontal assembly
Vertical assembly= 1790
= ****See CODIFICATION
TABLE 120.010Master cylinder side for brake fluid (DOT 4) = FN
Master cyl.side for mineral oil (DEXRON II) = MN

MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 041787**Master Cylinder DUAL CIRCUIT Ø35 – Ø39 with Open Centre
BOOSTER Ø50 with Accumulator****CONNECTIONS**

A	Accumulator port	1/4" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

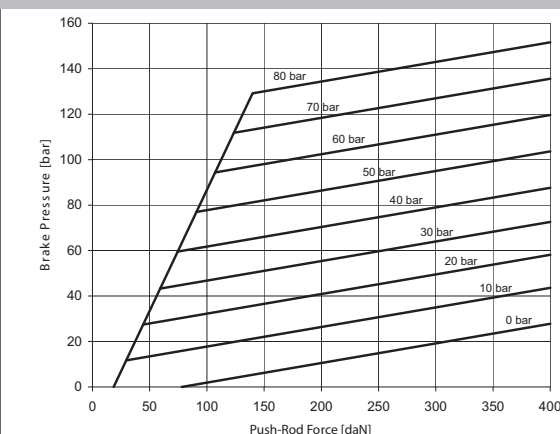
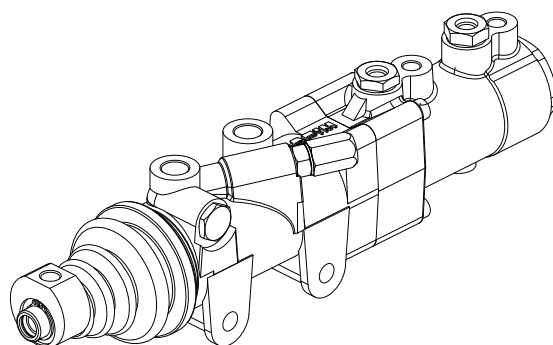
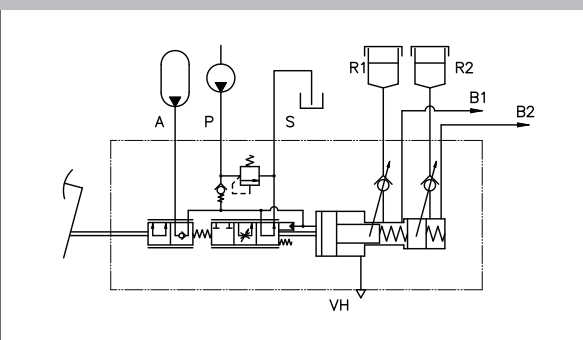
1st circuit piston diameter	35 mm
2nd circuit piston diameter	39 mm
1st circuit displacement	22.5 cm ³
2nd circuit displacement	23.5 cm ³
Total displacement	46 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	29.5 mm
2nd circuit stroke	20.5 mm
Ratio between 1st circuit and booster area	1.94
Ratio between 2nd circuit and booster area	1.56

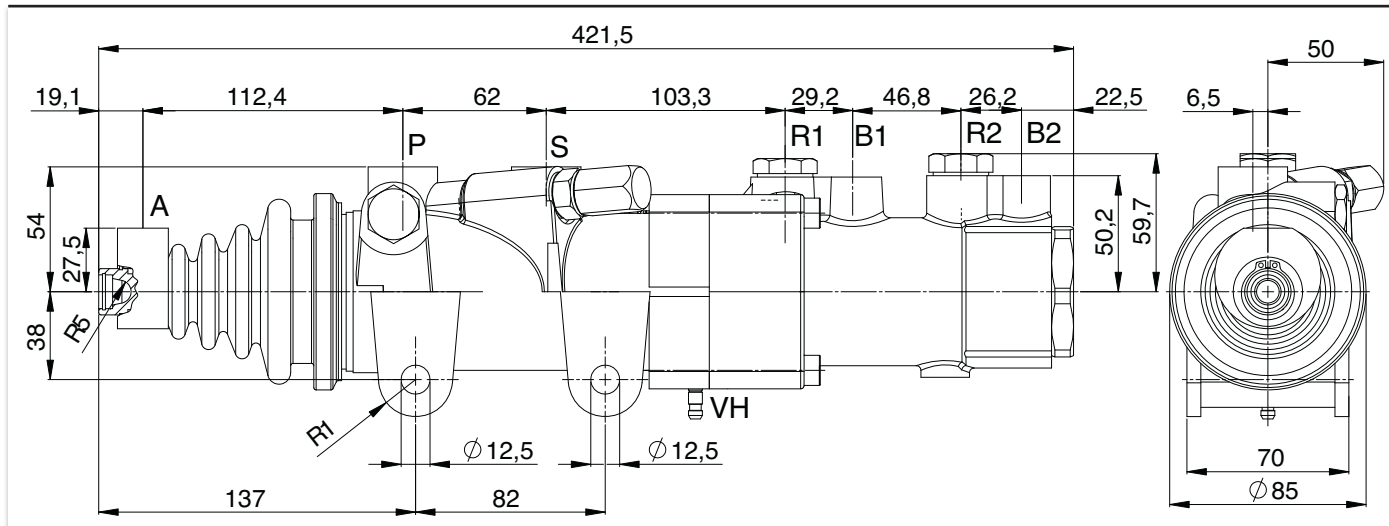
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

ORDER PART NUMBER

04	1787	FN	
Product class = 04			
Horizontal assembly orientation master cylinder	= 1787		See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

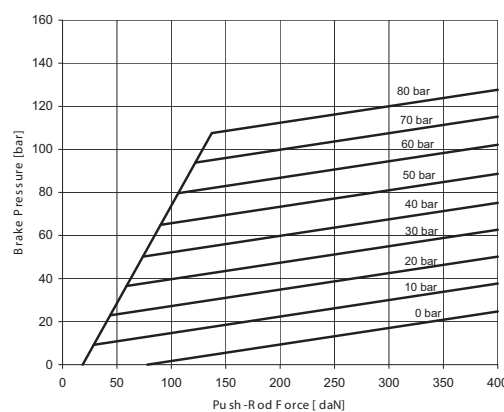
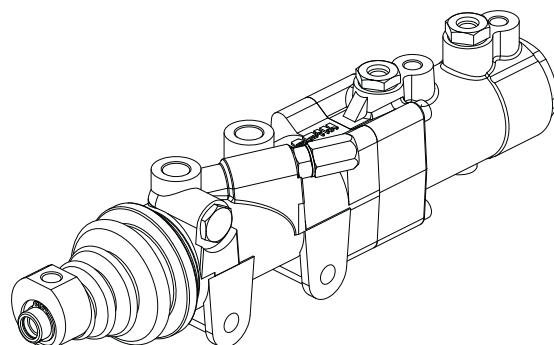
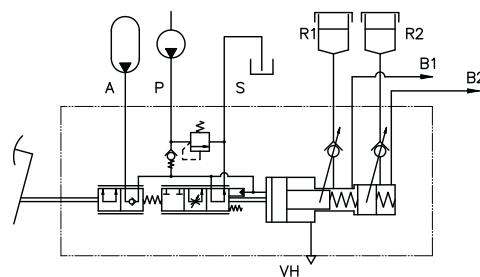
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC**

cod. 041795 Master Cylinder DUAL CIRCUIT Ø38 – Ø42 with Open Centre BOOSTER Ø50 with Accumulator

CONNECTIONS

A	Accumulator port	¼" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	38 mm
2nd circuit piston diameter	42 mm
1st circuit displacement	27 cm ³
2nd circuit displacement	27 cm ³
Total displacement	54 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	29.5 mm
2nd circuit stroke	20.5 mm
Ratio between 1st circuit and booster area	1.64
Ratio between 2nd circuit and booster area	1.35

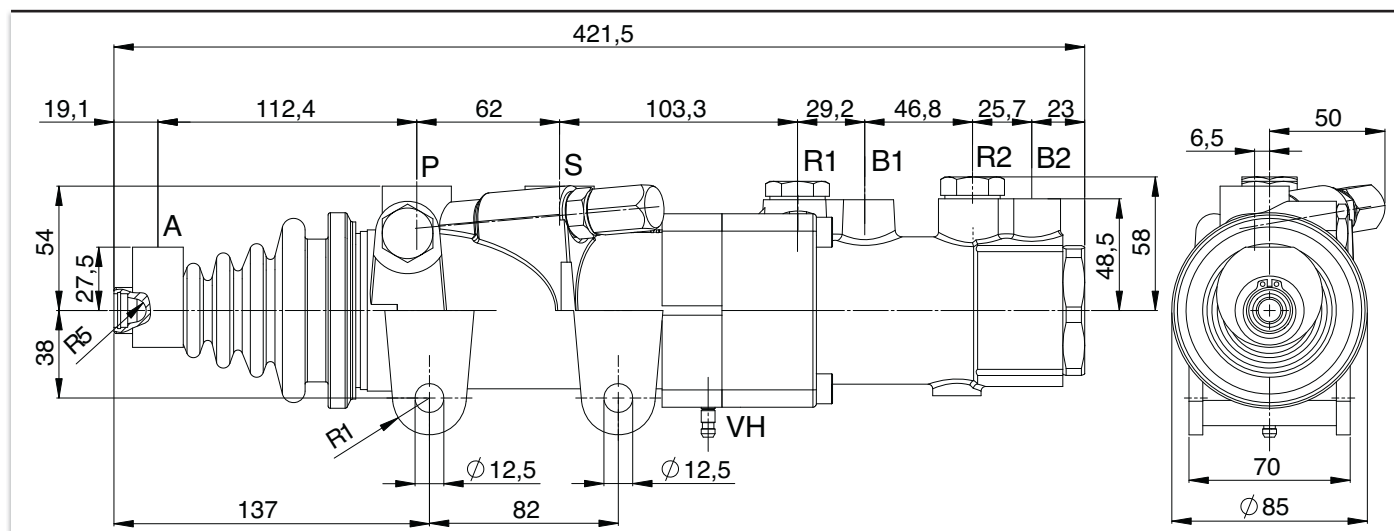
FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

ORDER PART NUMBER
04 1795 FN

Product class = 04

Horizontal assembly
orientation master cylinder = 1795See CODIFICATION
TABLE 120.010Master cylinder side for brake fluid (DOT 4) = FN
Master cyl.side for mineral oil (DEXRON II) = MN

cod. 041796**Master Cylinder DUAL CIRCUIT Ø42 – Ø46 with Open Centre
BOOSTER Ø50 with Accumulator****CONNECTIONS**

A	Accumulator port	1/4" Gas
P	Booster feeding	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M14x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M14x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

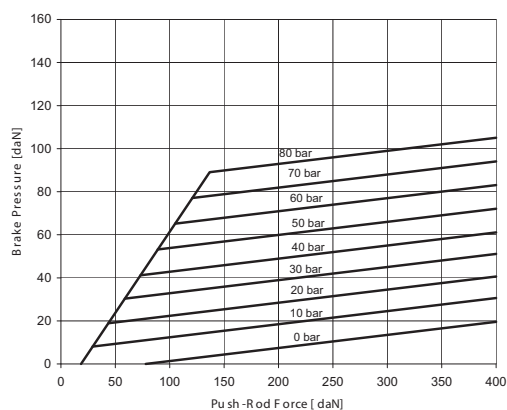
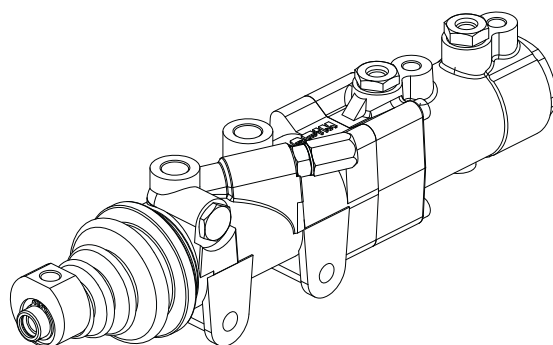
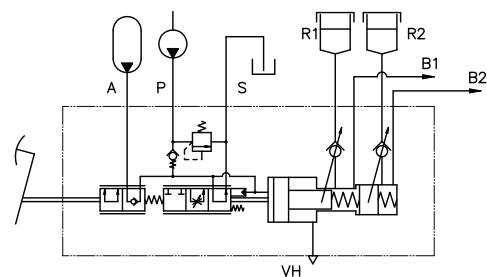
1st circuit piston diameter	42 mm
2nd circuit piston diameter	46 mm
1st circuit displacement	30 cm ³
2nd circuit displacement	35 cm ³
Total displacement	65 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	27.5 mm
2nd circuit stroke	22.5 mm
Ratio between 1st circuit and booster area	1.34
Ratio between 2nd circuit and booster area	1.12

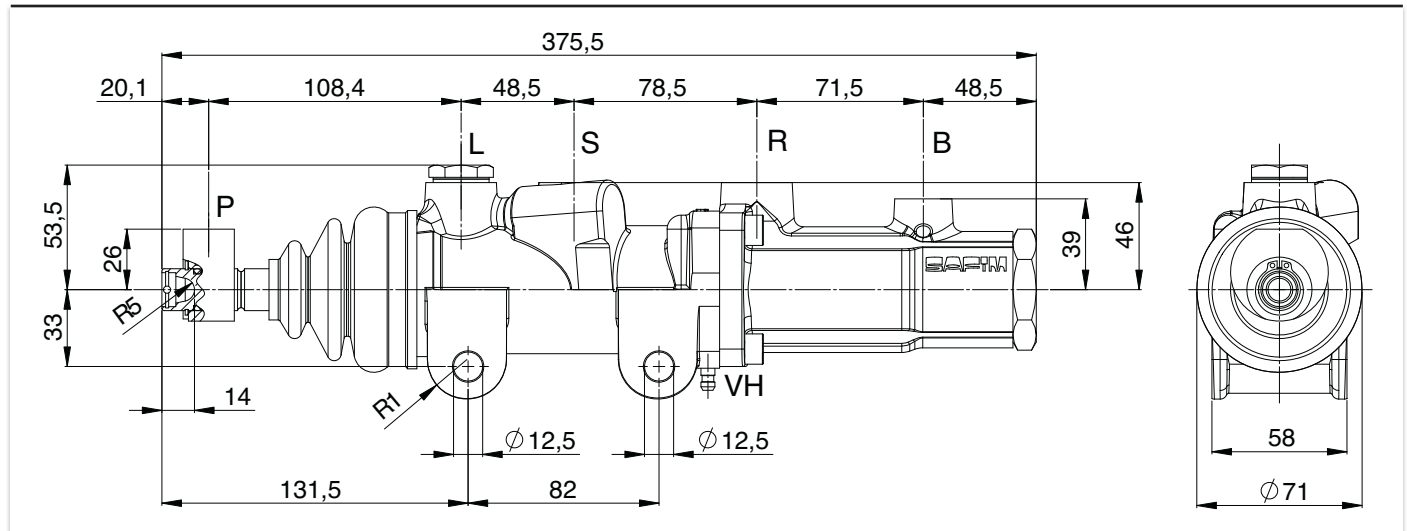
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Min. booster setting (excluding other versions)	30 bar
Max tank pressure	0.5 bar
Max feeding pressure with master cylinder not operating	1.5 bar
Booster oil flow	5÷22 l/min

ORDER PART NUMBER

04	1796	FN	
Product class = 04			
Horizontal assembly orientation master cylinder	= 1795		See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

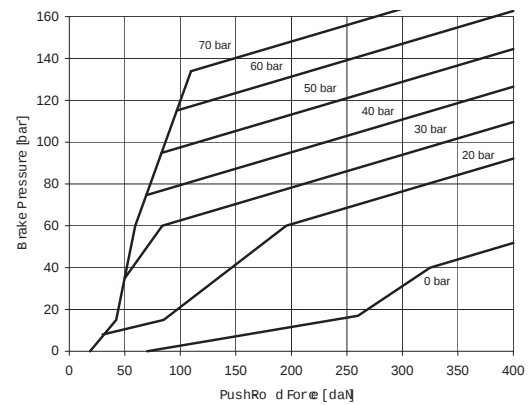
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC**

cod. 051328 Step Bore Master Cylinder SINGLE CIRCUIT Ø38/25 with Closed Centre BOOSTER Ø38

CONNECTIONS

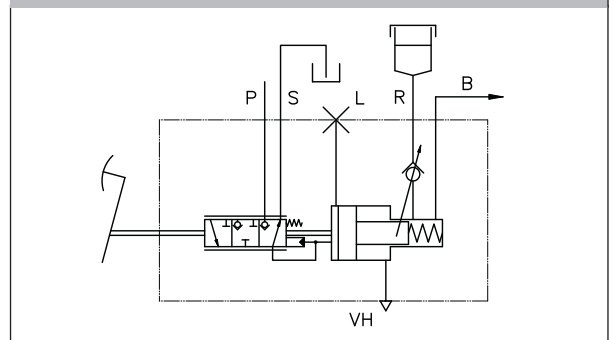
P	Booster feeding	¼" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

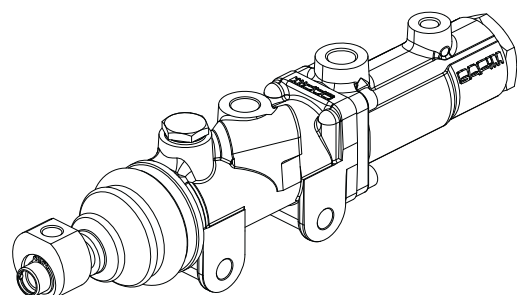
Piston diameter	38/25 mm
Displacement	19/44 cm ³
Booster control piston diameter	38 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.18

FUNCTION DIAGRAM

WORKING CONDITIONS

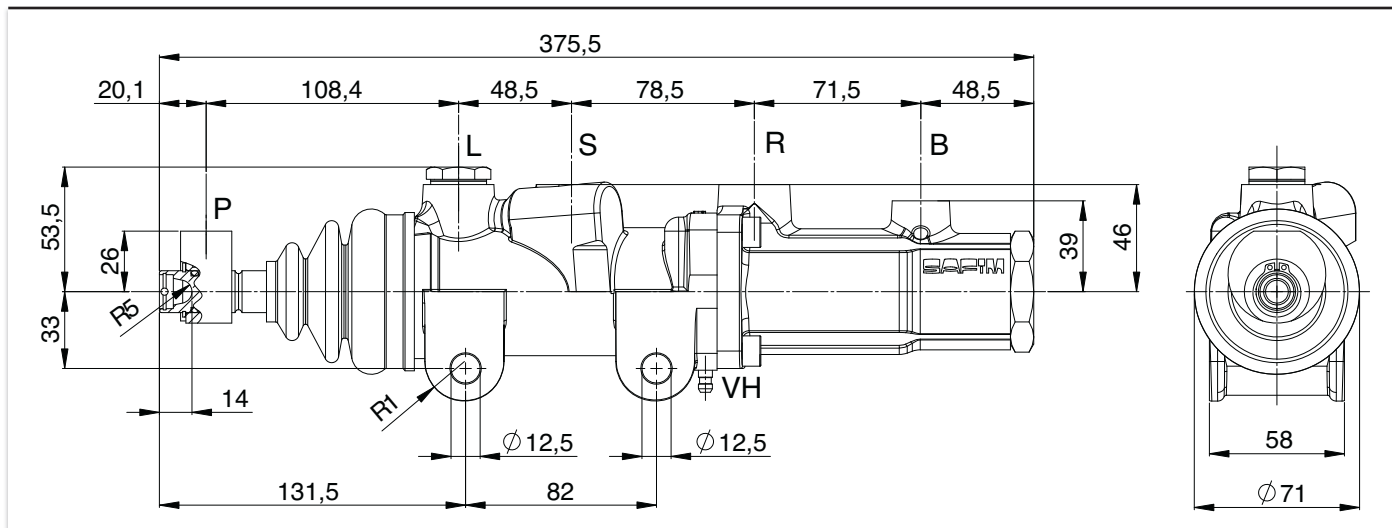
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

05	1328	FN	
Product class = 04			
Horizontal/Vertical assembly orientation master cylinder	= 1328		See CODIFICATION TABLE 120.010
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			



MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 051403**Step Bore Master Cylinder SINGLE CIRCUIT Ø40/30 with Closed Centre BOOSTER Ø40****CONNECTIONS**

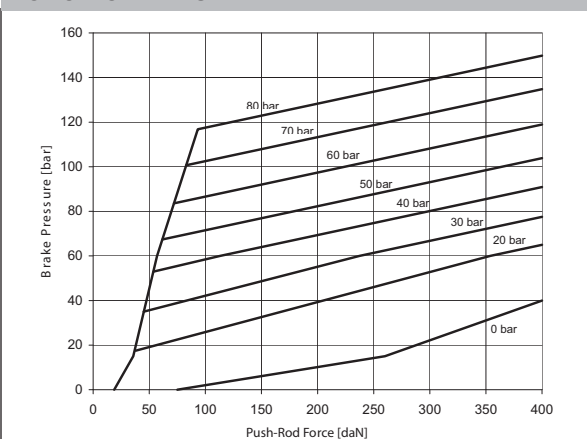
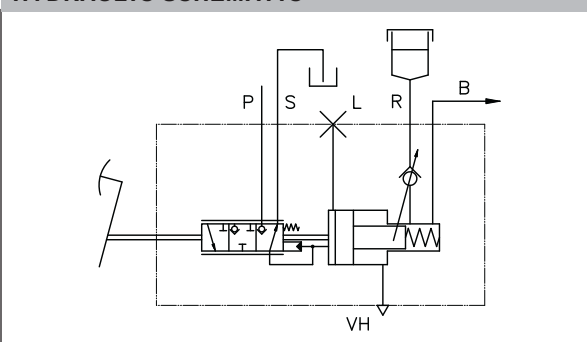
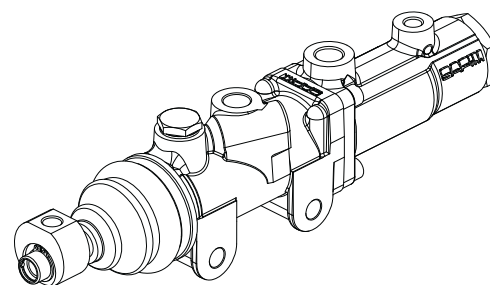
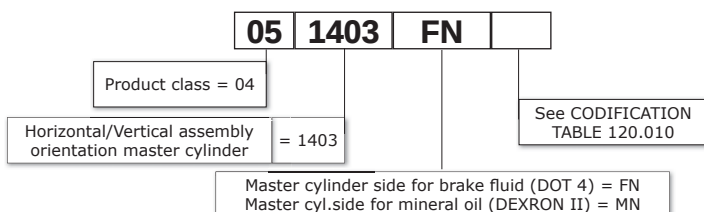
P	Booster feeding	1/4" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

Piston diameter	40/30 mm
Displacement	27.5/49 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.64

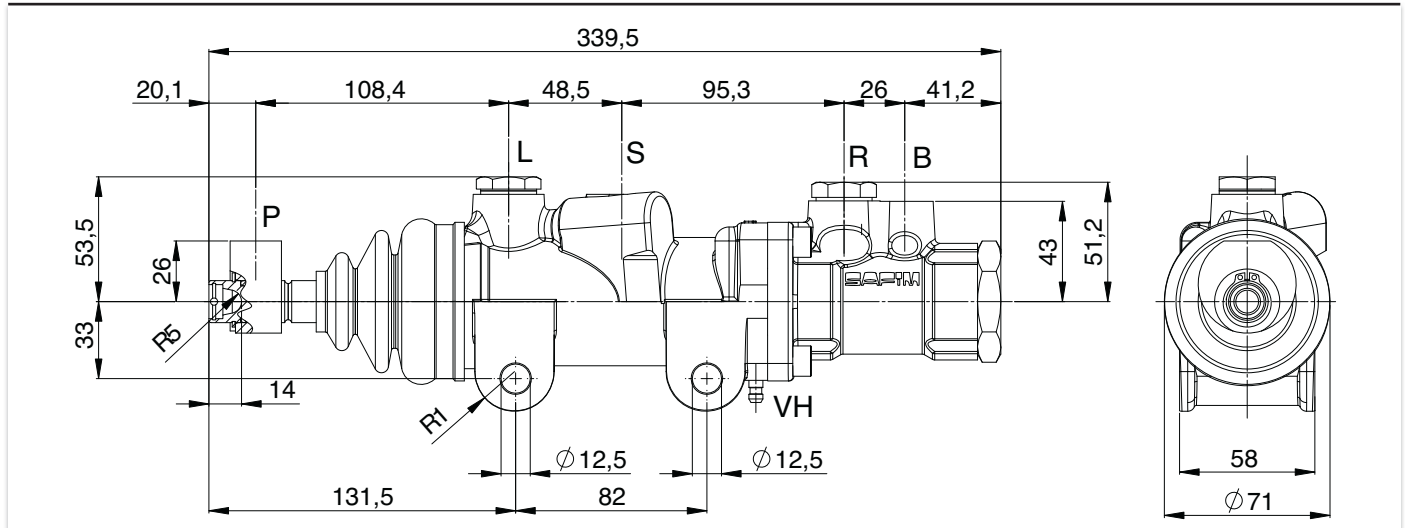
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

MNR and FNR versions can be assembled on pedal 022193, see page 110.010

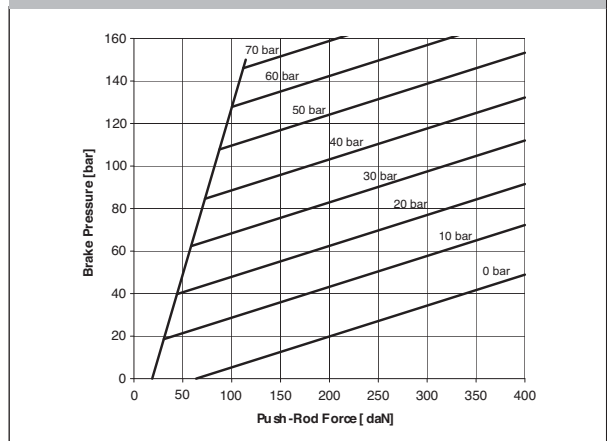
cod. 041329

Master Cylinder SINGLE CIRCUIT Ø25 with Closed Centre BOOSTER Ø40**CONNECTIONS**

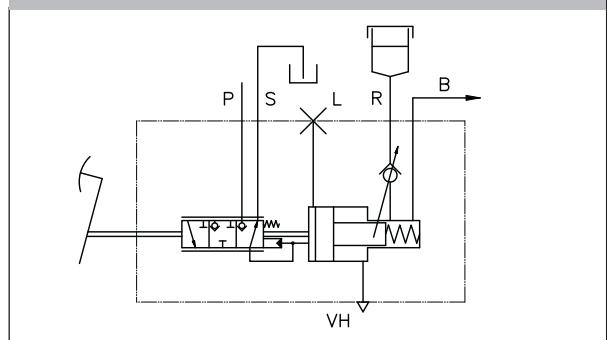
P	Booster feeding	¼" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M10x1.25
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

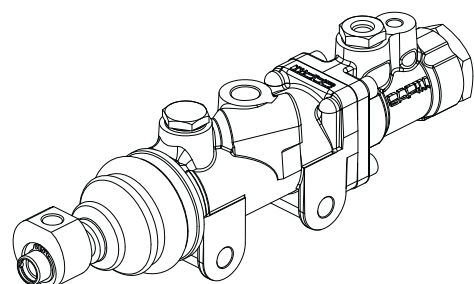
Piston diameter	25 mm
Displacement	19 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.36

FUNCTION DIAGRAM**WORKING CONDITIONS**

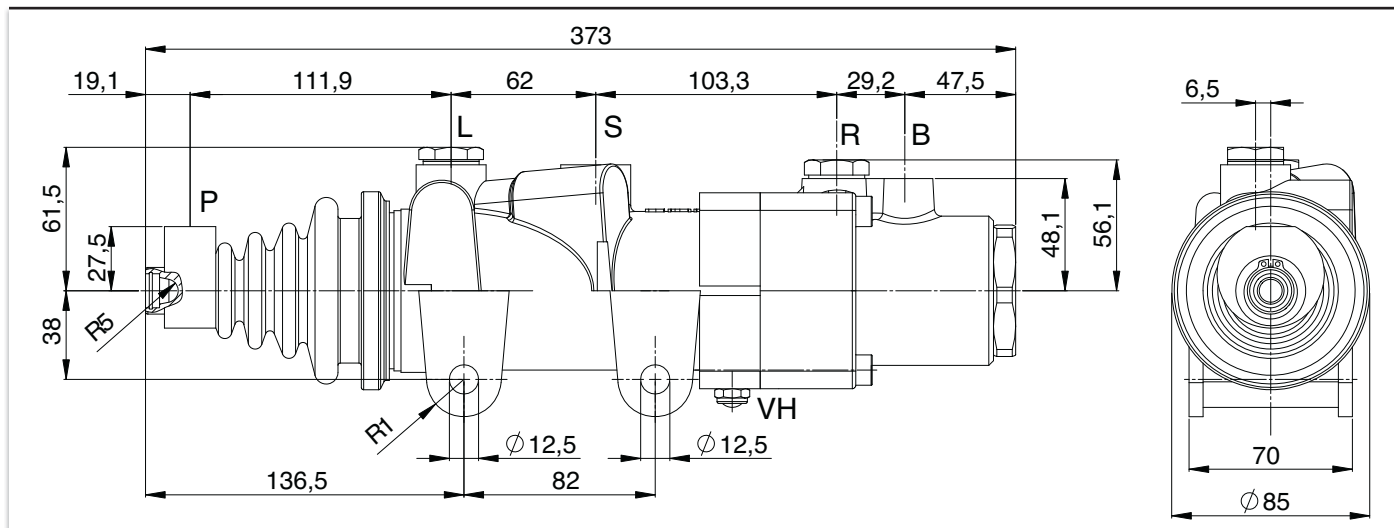
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

HYDRAULIC SCHEMATIC**ORDER PART NUMBER**

04	1329	FN	
Product class = 04			
Horizontal assembly orientation = 1329 Vertical assembly orientation = ****			
See CODIFICATION TABLE 120.010			
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			



MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 041436**Master Cylinder SINGLE CIRCUIT Ø35 with Closed Centre BOOSTER Ø50****CONNECTIONS**

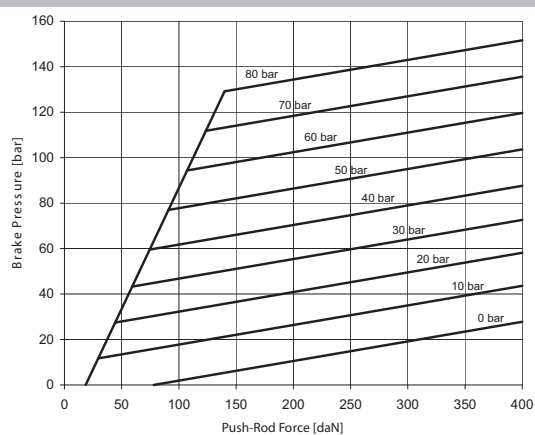
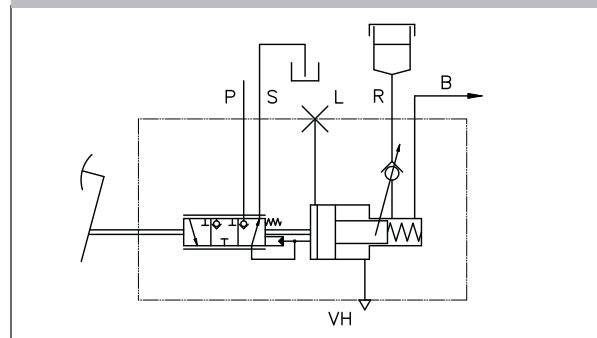
P	Booster feeding	1/4" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

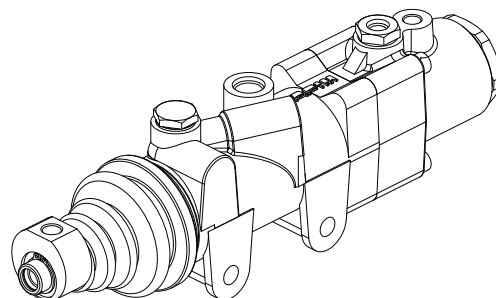
Piston diameter	35 mm
Displacement	47 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.94

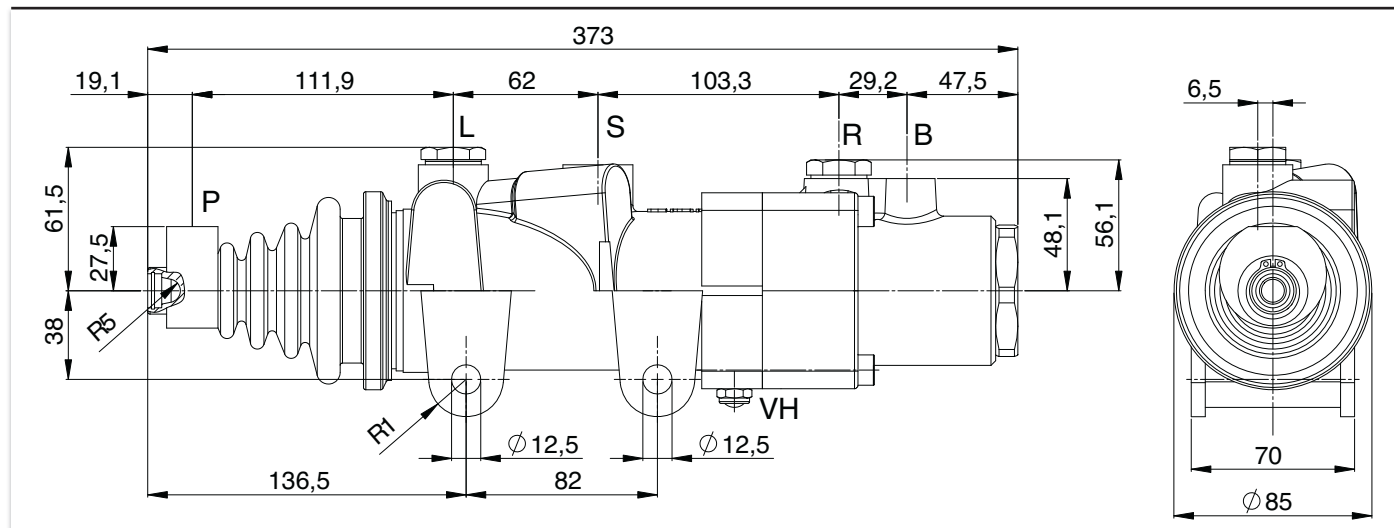
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

04	1436	FN	
Product class = 04			
Horizontal assembly orientation = 1436			
See CODIFICATION TABLE 120.010			
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			



cod. 041437 Master Cylinder SINGLE CIRCUIT Ø38 with Closed Centre BOOSTER Ø50

CONNECTIONS

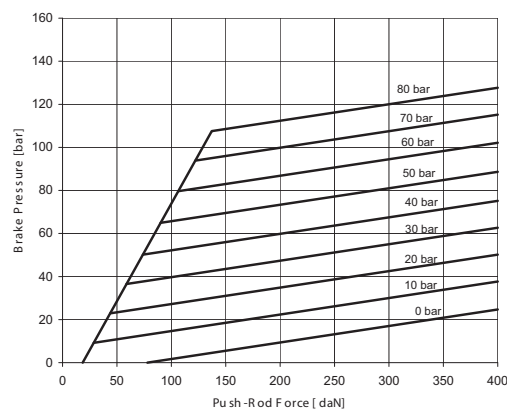
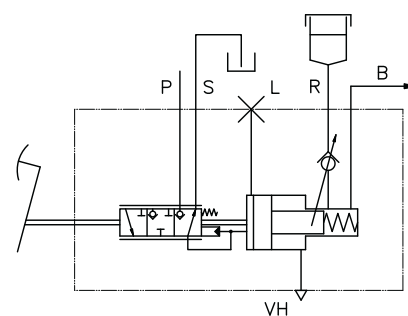
P	Booster feeding	¼" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

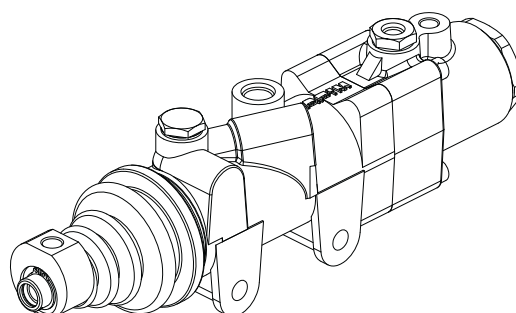
Piston diameter	38 mm
Displacement	55,5 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	50 mm
Ratio between 1st circuit and booster area	1.64

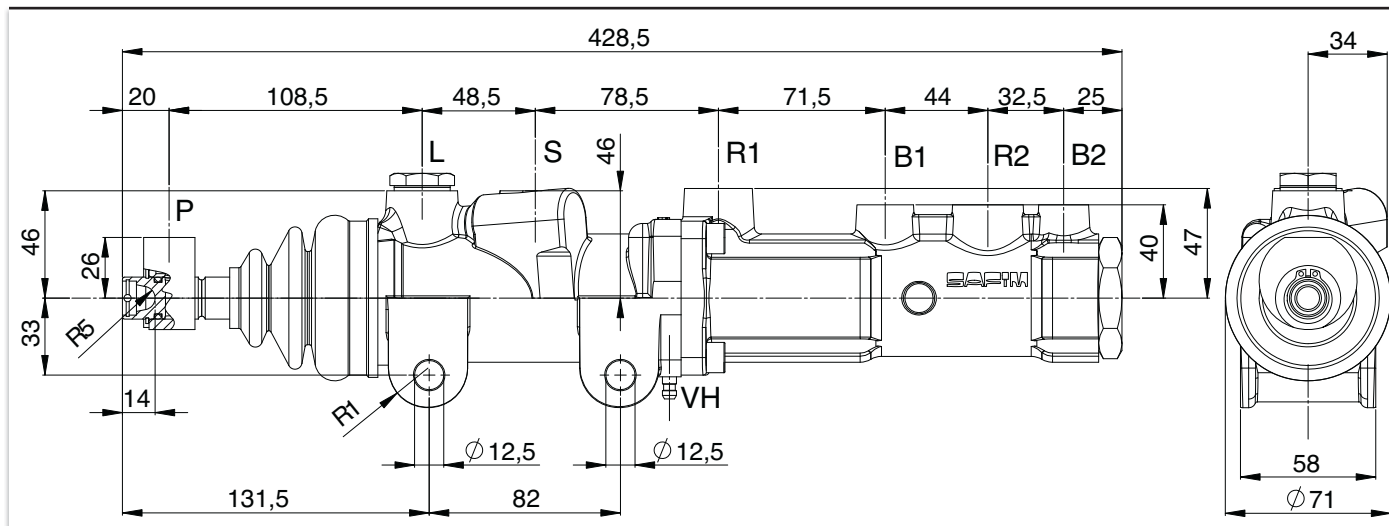
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	1437	FN	
Product class = 04			See CODIFICATION TABLE 120.010
Horizontal assembly orientation = 1437			
			Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN



cod. 051285 Step Bore Master Cylinder DUAL CIRCUIT Ø38/25 - Ø31,75 with Closed Centre BOOSTER Ø38

CONNECTIONS

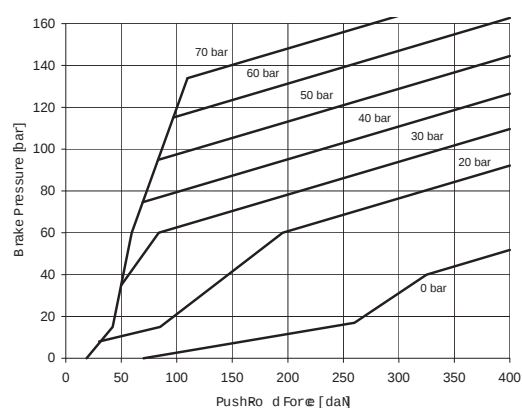
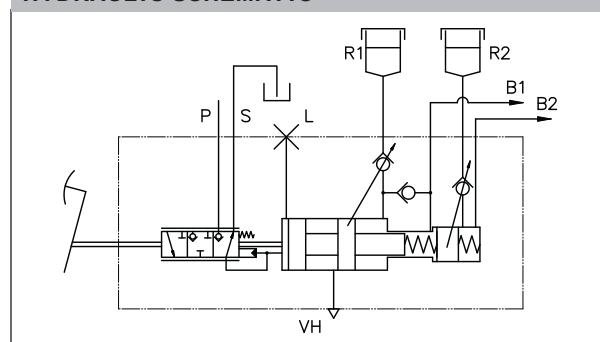
P	Booster feeding	1/4" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	38/25 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	5/30 cm ³
2nd circuit displacement	13.5 cm ³
Total displacement	18.5/43.5 cm ³
Booster control piston diameter	38 mm
Push-rod stroke	42 mm
1st circuit stroke	22 mm
2nd circuit stroke	18 mm
Ratio between 1st circuit and booster area	2.18
Ratio between 2nd circuit and booster area	1.31

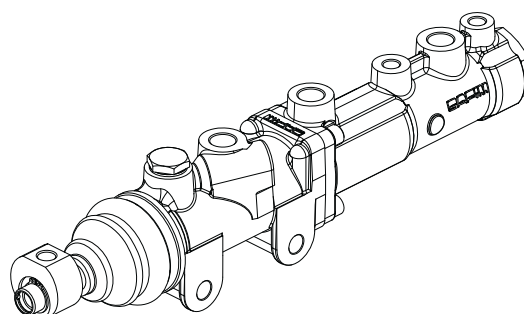
WORKING CONDITIONS

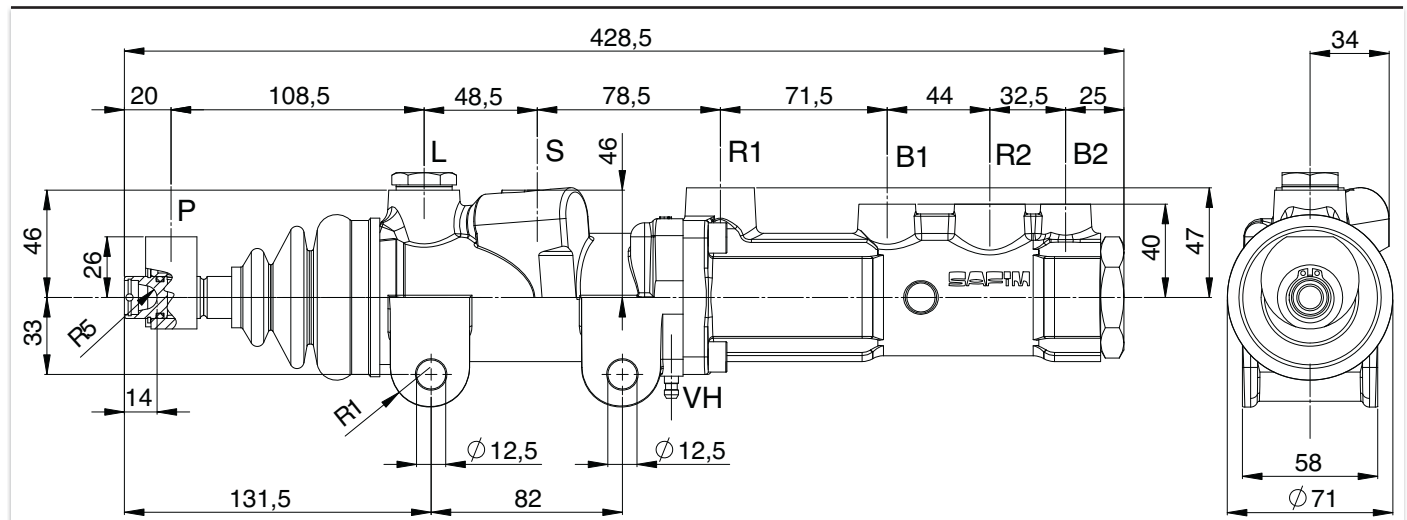
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

05	1285	FN	
Product class = 04			
Horizontal/Vertical assembly orientation master cylinder = 1285			
See CODIFICATION TABLE 120.010			
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN			

MNR and FNR versions can be assembled on pedal 022193, see page 110.010

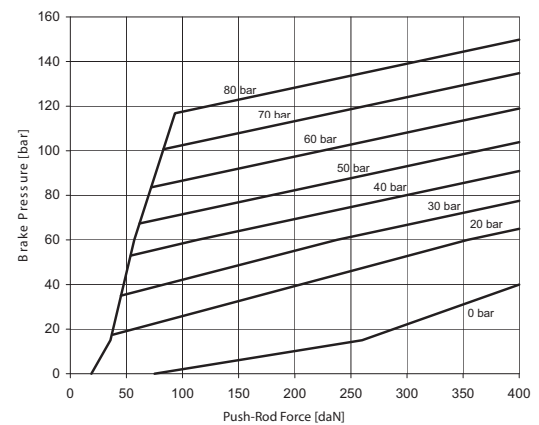
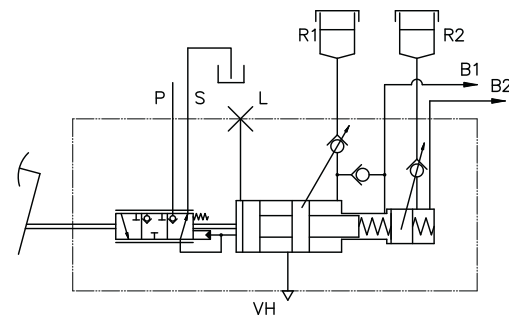


cod. 051410**Step Bore Master Cylinder DUAL CIRCUIT Ø40/30 - Ø35 with Closed Centre BOOSTER Ø40****CONNECTIONS**

P	Booster feeding	¼" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	40/30 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	8.5/30 cm ³
2nd circuit displacement	18 cm ³
Total displacement	26.5/48 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.64
Ratio between 2nd circuit and booster area	1.2

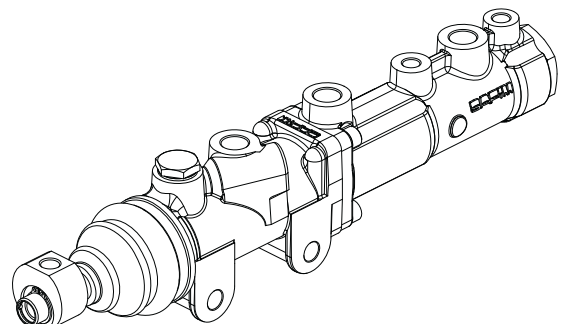
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****WORKING CONDITIONS**

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

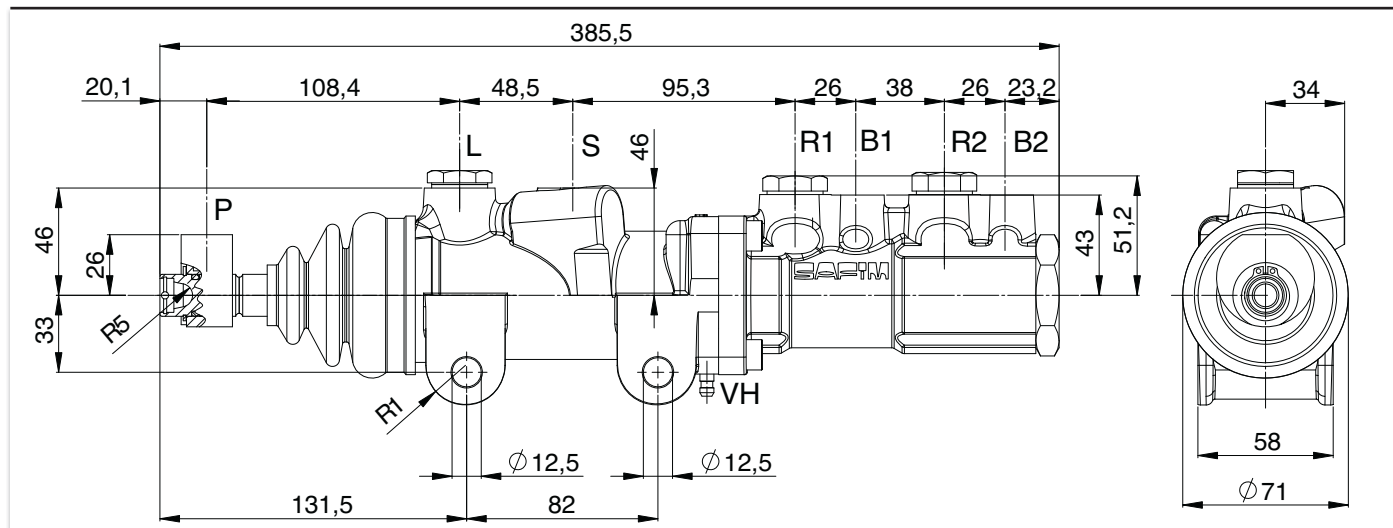
ORDER PART NUMBER

05	1410	FN	
Product class = 04			
Horizontal/Vertical assembly orientation master cylinder	= 1410		See CODIFICATION TABLE 120.010
		Master cylinder side for brake fluid (DOT 4) = FN	
		Master cyl.side for mineral oil (DEXRON II) = MN	

MNR and FNR versions can be assembled on pedal 022193, see page 110.010



cod. 041345 Master Cylinder DUAL CIRCUIT Ø25 – Ø29 with Closed Centre BOOSTER Ø40



CONNECTIONS

P	Booster feeding	¼" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M10x1.25
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M10x1.25
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

1st circuit piston diameter	25 mm
2nd circuit piston diameter	29 mm
1st circuit displacement	9 cm ³
2nd circuit displacement	9.5 cm ³
Total displacement	18 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	42 mm
1st circuit stroke	24.5 mm
2nd circuit stroke	15.5 mm
Ratio between 1st circuit and booster area	2.36
Ratio between 2nd circuit and booster area	1.75

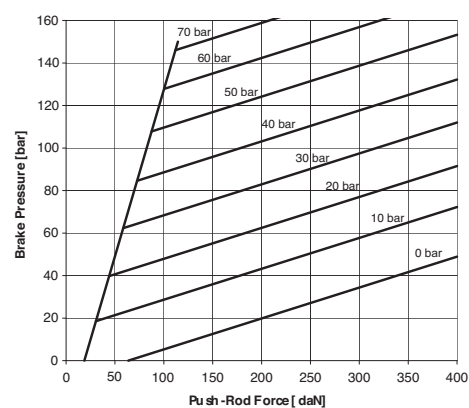
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

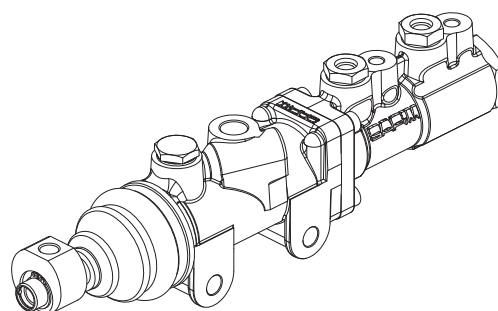
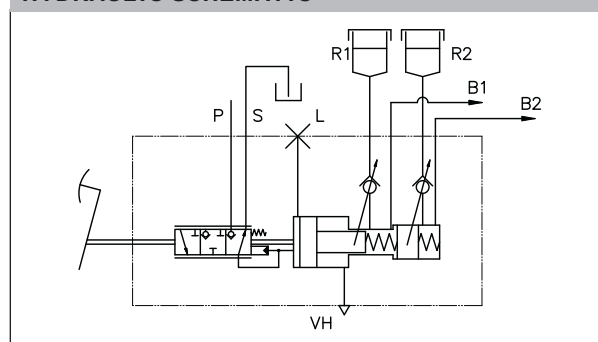
ORDER PART NUMBER

04		1345		FN		
Product class = 04						
Horizontal assembly orientation = 1345						See CODIFICATION TABLE 120.010
Vertical assembly orientation = ****						
Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN						

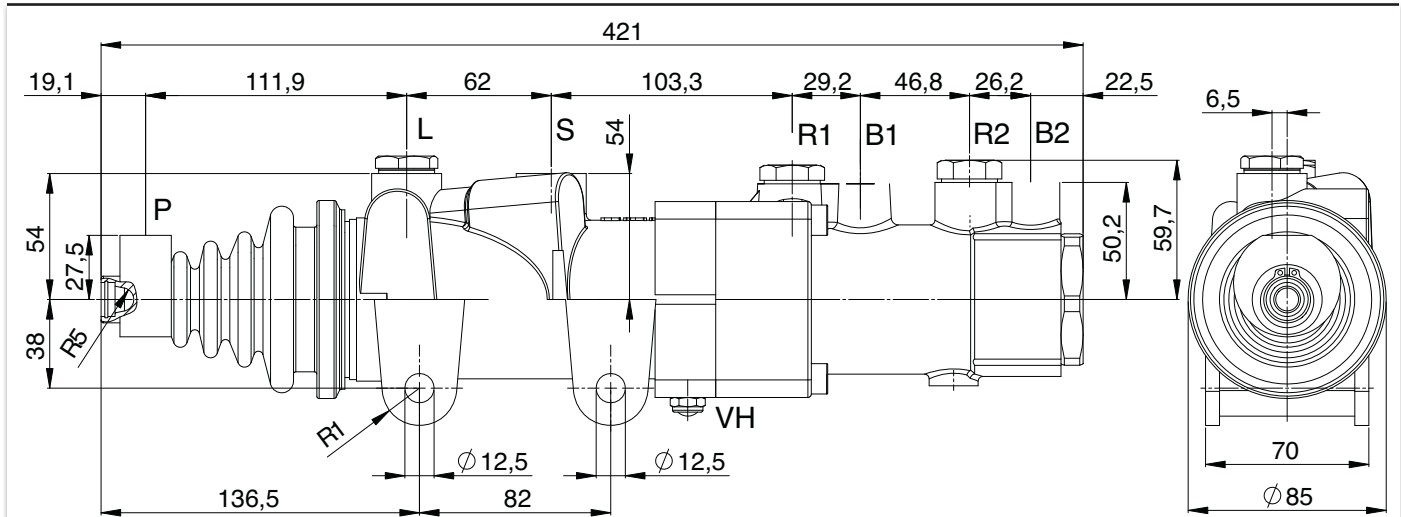
FUNCTION DIAGRAM



HYDRAULIC SCHEMATIC



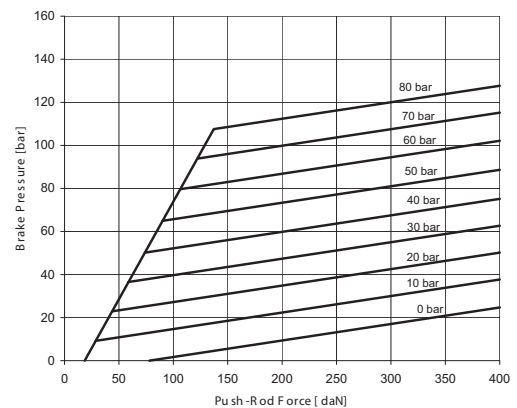
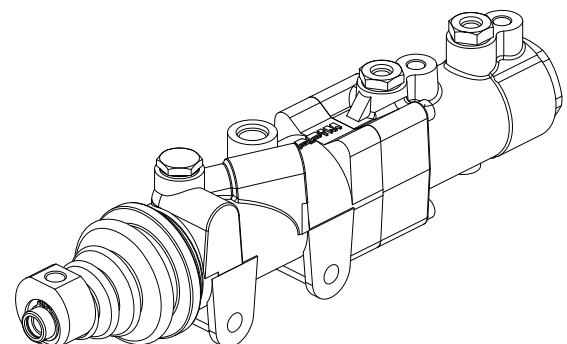
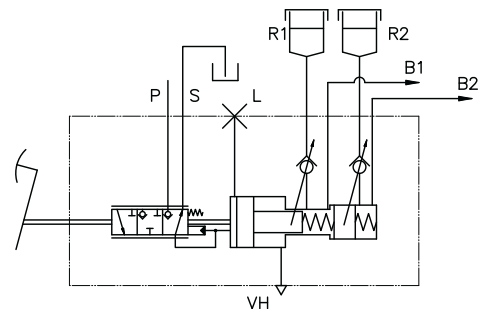
MNR and FNR versions can be assembled on pedal 022193, see page 110.010

cod. 041781**Master Cylinder DUAL CIRCUIT Ø38 – Ø42 with Closed Centre BOOSTER Ø50****CONNECTIONS**

P	Booster feeding	¼" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

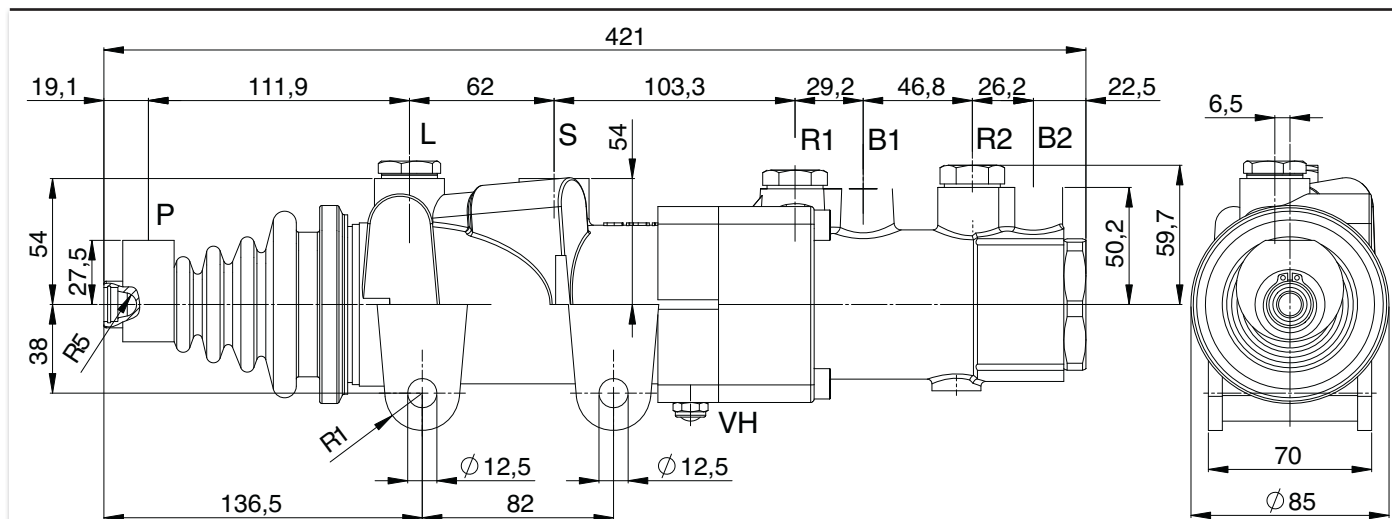
1st circuit piston diameter	38 mm
2nd circuit piston diameter	42 mm
1st circuit displacement	27 cm ³
2nd circuit displacement	27 cm ³
Total displacement	54 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	29.5 mm
2nd circuit stroke	20.5 mm
Ratio between 1st circuit and booster area	1.64
Ratio between 2nd circuit and booster area	1.35

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER****04 1781 FN**

Product class = 04

Horizontal assembly orientation = 1781

See CODIFICATION
TABLE 120.010Master cylinder side for brake fluid (DOT 4) = FN
Master cyl.side for mineral oil (DEXRON II) = MN

cod. 043647 Master Cylinder DUAL CIRCUIT Ø38 – Ø42 with Closed Centre BOOSTER Ø50

CONNECTIONS

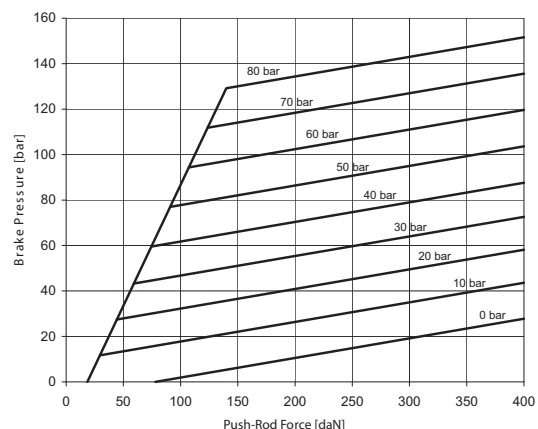
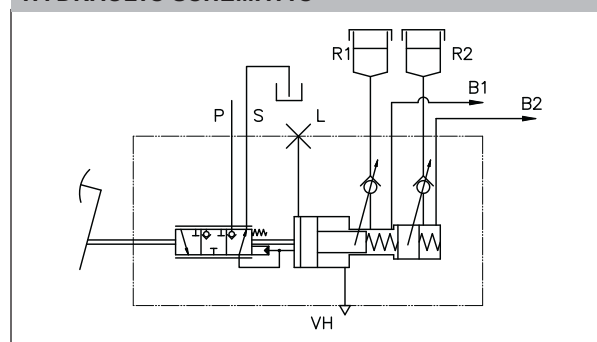
P	Booster feeding	1/4" Gas
L	LS signal port	M18x1.5
S	Tank port	M18x1.5
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.5
VH	Vent hole (only for FN – brake fluid)	

TECHNICAL FEATURES

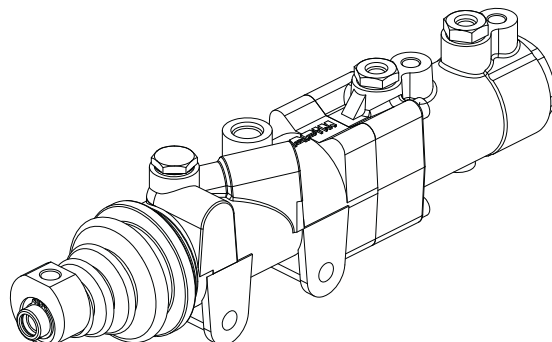
1st circuit piston diameter	35 mm
2nd circuit piston diameter	39 mm
1st circuit displacement	22.5 cm ³
2nd circuit displacement	23.5 cm ³
Total displacement	46 cm ³
Booster control piston diameter	50 mm
Push-rod stroke	52 mm
1st circuit stroke	29.5 mm
2nd circuit stroke	20.5 mm
Ratio between 1st circuit and booster area	1.94
Ratio between 2nd circuit and booster area	1.56

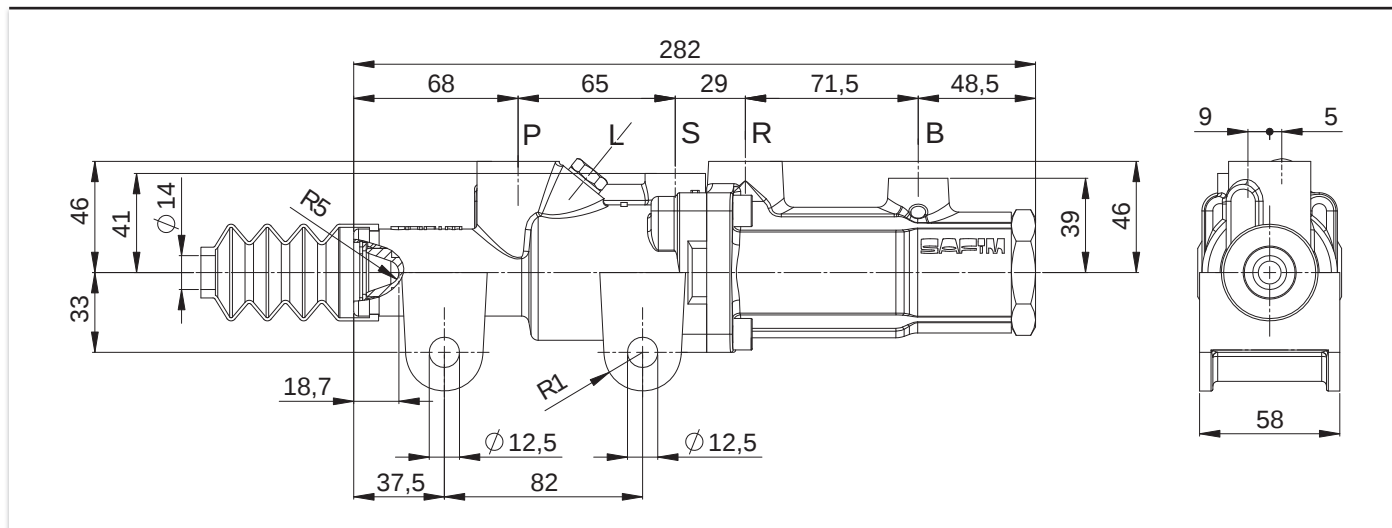
WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (brake fluid)	-30° ÷ +100°C
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	3647	FN	
Product class = 04			
Horizontal assembly orientation = 3647			See CODIFICATION TABLE 120.010
			Master cylinder side for brake fluid (DOT 4) = FN Master cyl.side for mineral oil (DEXRON II) = MN



cod. 052076MN Step Bore Master Cylinder SINGLE CIRCUIT Ø38/25 with Closed Centre BOOSTER Ø40 for Mineral Oil

CONNECTIONS

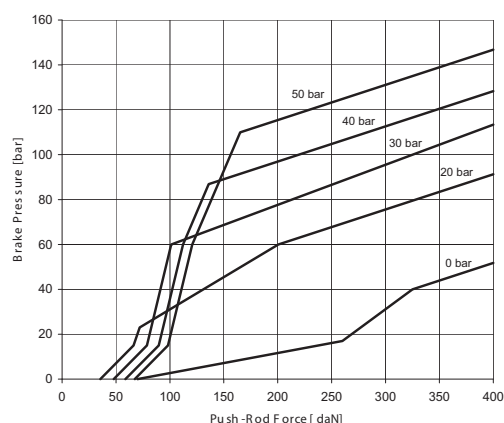
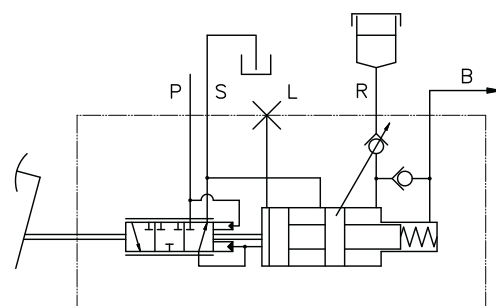
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	¼" Gas
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

Piston diameter	38/25 mm
Displacement	19/44 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.56

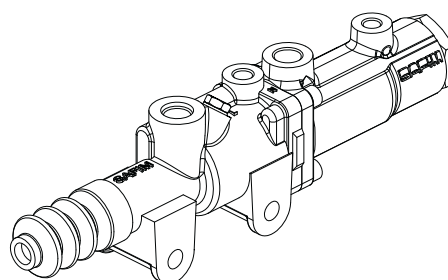
WORKING CONDITIONS

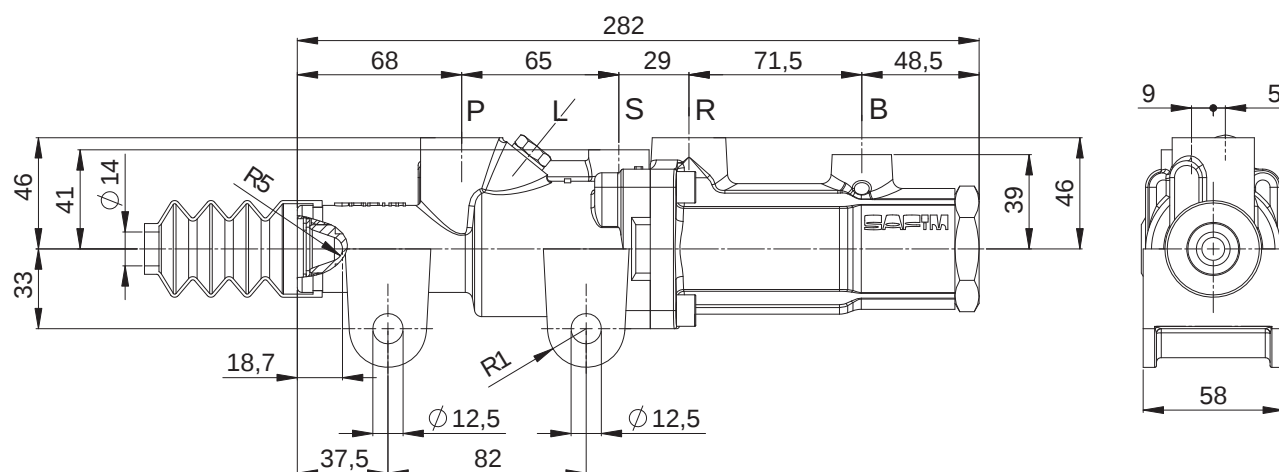
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

05	2076	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 2076		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	

MNO versions can be assembled on pedal 021678, see page 110.010



cod. 051979 MN Step Bore Master Cylinder SINGLE CIRCUIT Ø38/25 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

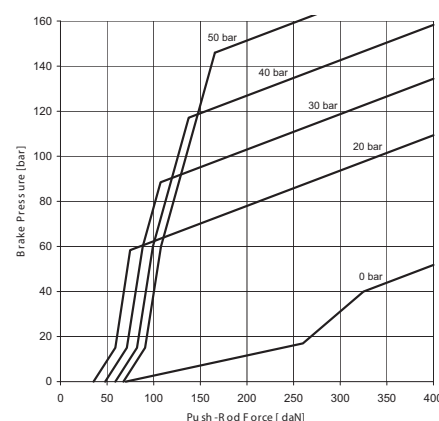
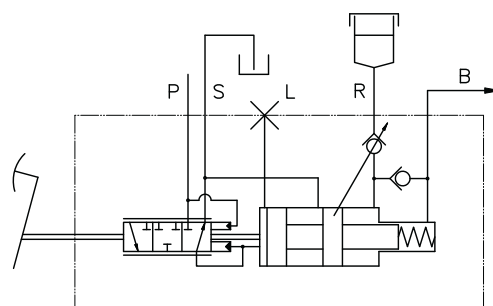
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

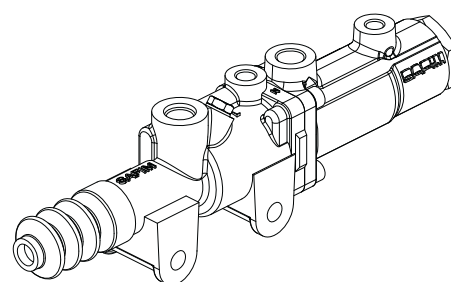
Piston diameter	38/25 mm
Displacement	19/44 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	3.3

WORKING CONDITIONS

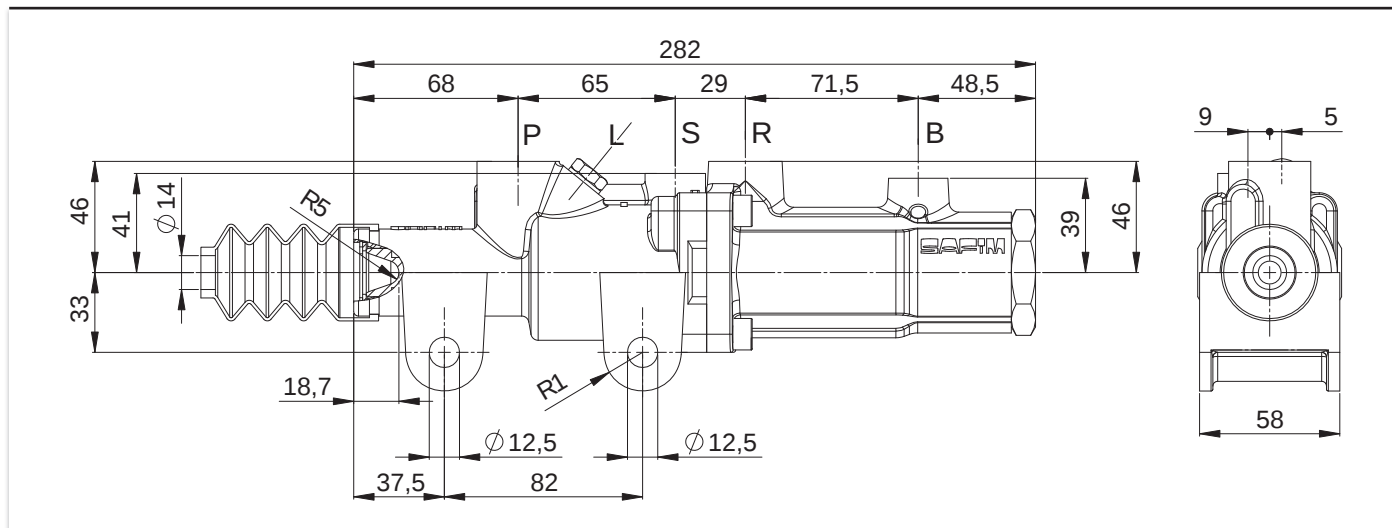
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

05	1979	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1979		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	



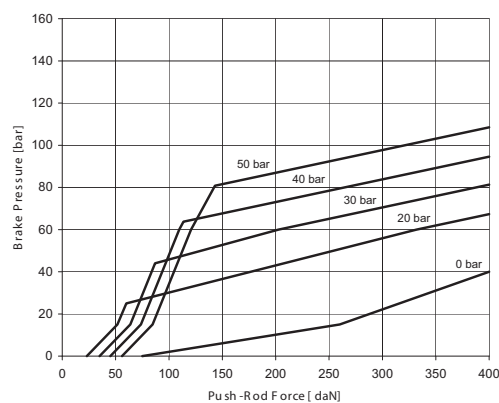
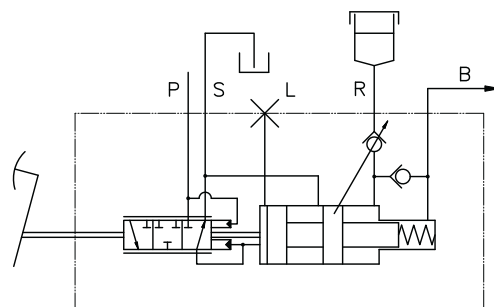
MNO versions can be assembled on pedal 021678, see page 110.010

cod. 051612 MN**Step Bore Master Cylinder SINGLE CIRCUIT Ø40/30
with Closed Centre BOOSTER Ø40 for Mineral Oil****CONNECTIONS**

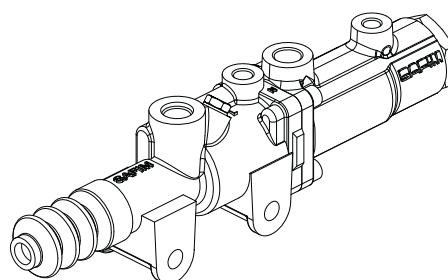
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

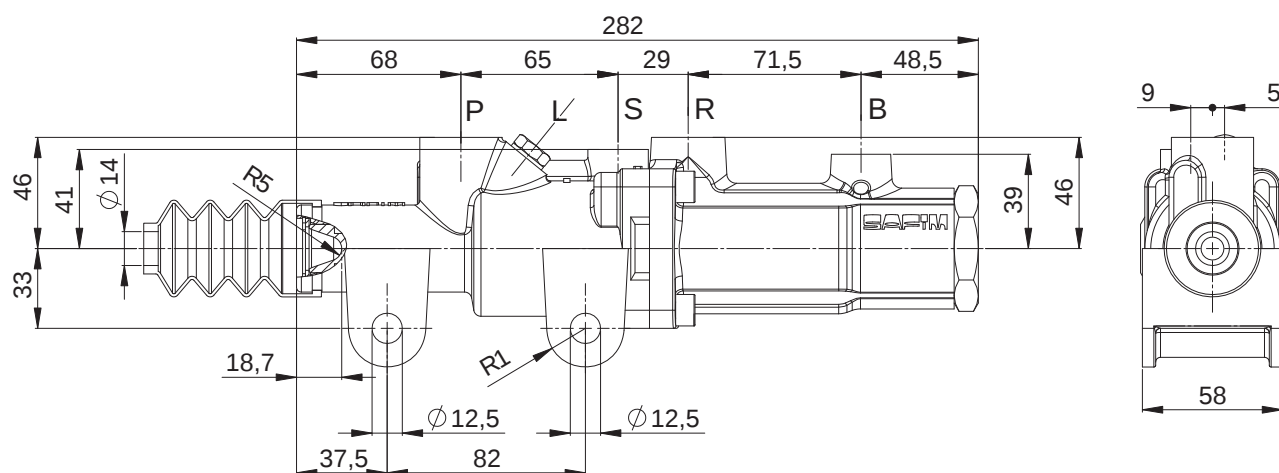
Piston diameter	40/30 mm
Displacement	27.5/49 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.7

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

05	1612	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1612		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	



MNO versions can be assembled on pedal 021678, see page 110.010

cod. 051614 MN**Step Bore Master Cylinder SINGLE CIRCUIT Ø40/30
with Closed Centre BOOSTER Ø46 for Mineral Oil****CONNECTIONS**

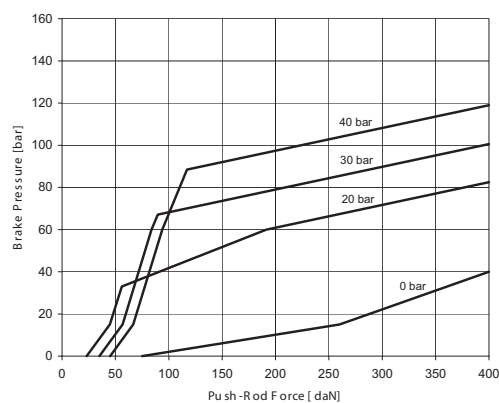
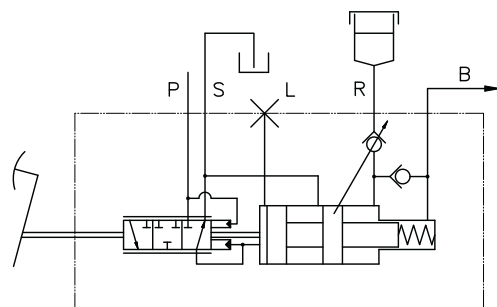
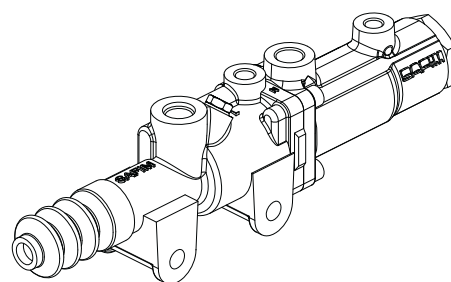
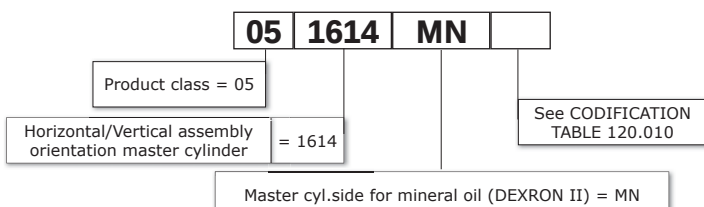
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M18x1.5 ISO 6149
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

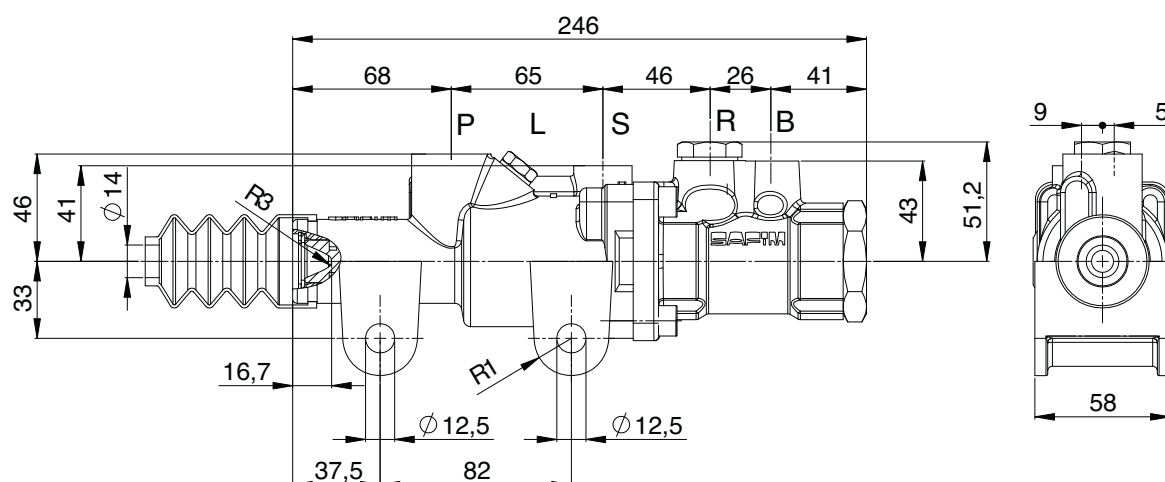
Piston diameter	40/30 mm
Displacement	27.5/49 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.35

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

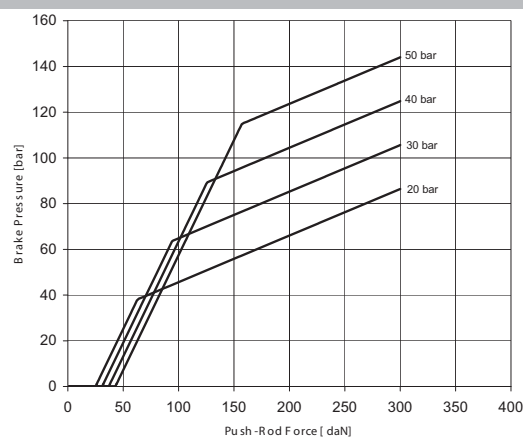
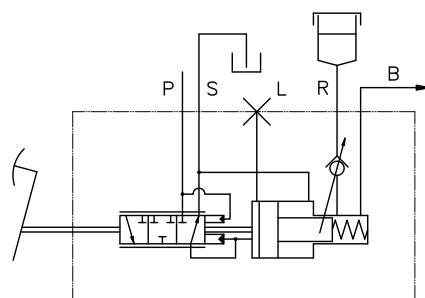
MNO versions can be assembled on pedal 021678, see page 110.010

cod. 041991MN**Master Cylinder SINGLE CIRCUIT Ø25 with Closed Centre BOOSTER Ø40 for Mineral Oil****CONNECTIONS**

P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M10x1.25

TECHNICAL FEATURES

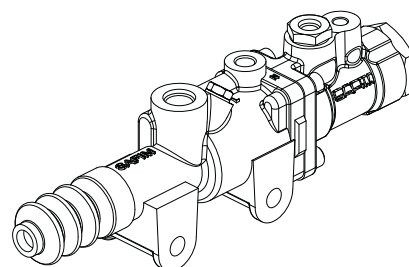
Piston diameter	25 mm
Displacement	19 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.56

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER****04 1991 MN**

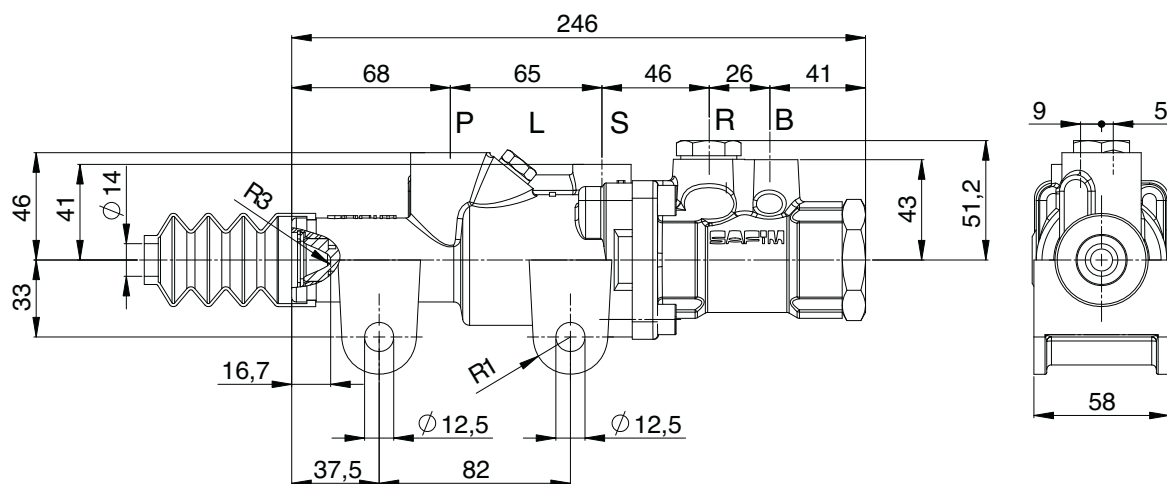
Product class = 04

Horizontal assembly orientation = 1991
Vertical assembly orientation = ****See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN



MNO versions can be assembled on pedal 021678, see page 110.010

cod. 041985MN**Master Cylinder SINGLE CIRCUIT Ø25 with Closed Centre BOOSTER Ø46 for Mineral Oil****CONNECTIONS**

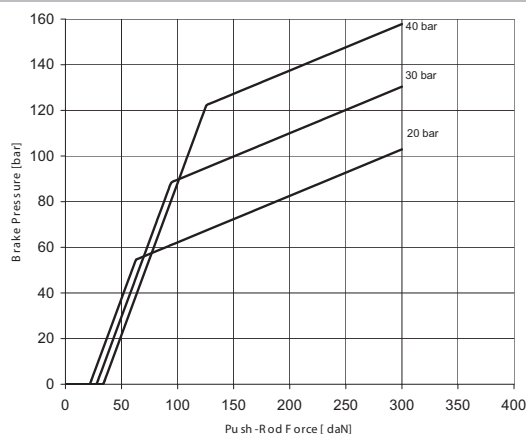
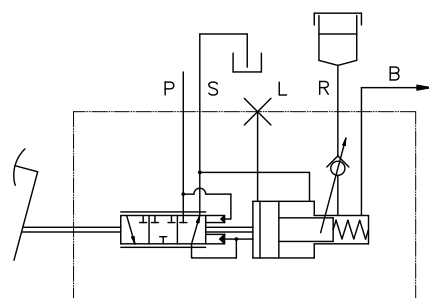
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5 ISO 6149
B	Connection to brakes	M10x1.25

TECHNICAL FEATURES

Piston diameter	25 mm
Displacement	19 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	46 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	3.3

WORKING CONDITIONS

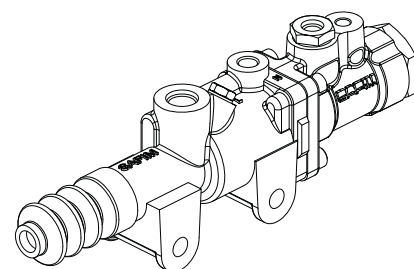
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER****04 1985 MN**

Product class = 04

Horizontal assembly orientation = 1985
Vertical assembly orientation = ****See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN

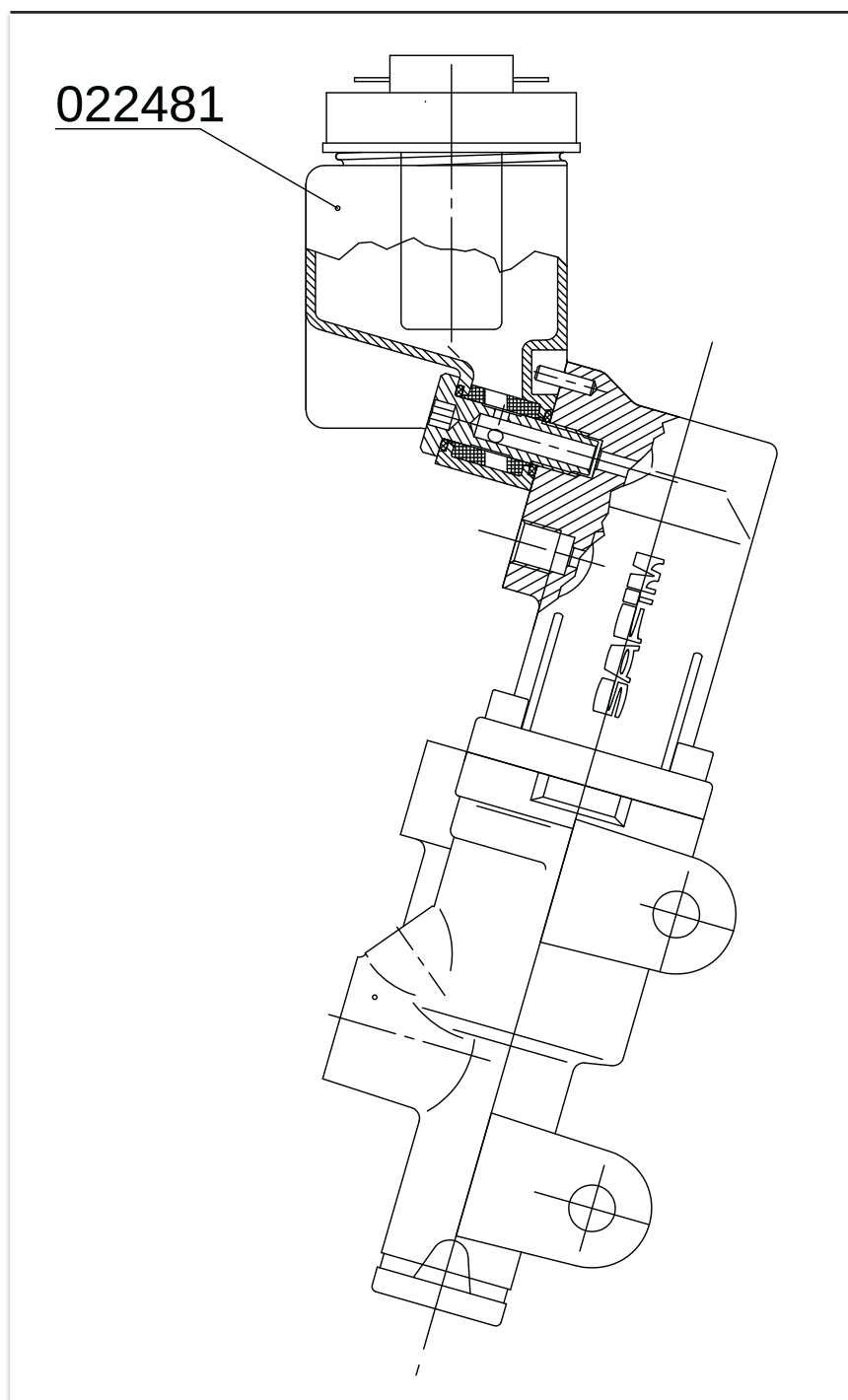


MNO versions can be assembled on pedal 021678, see page 110.010

Vertical – assembling master cylinders

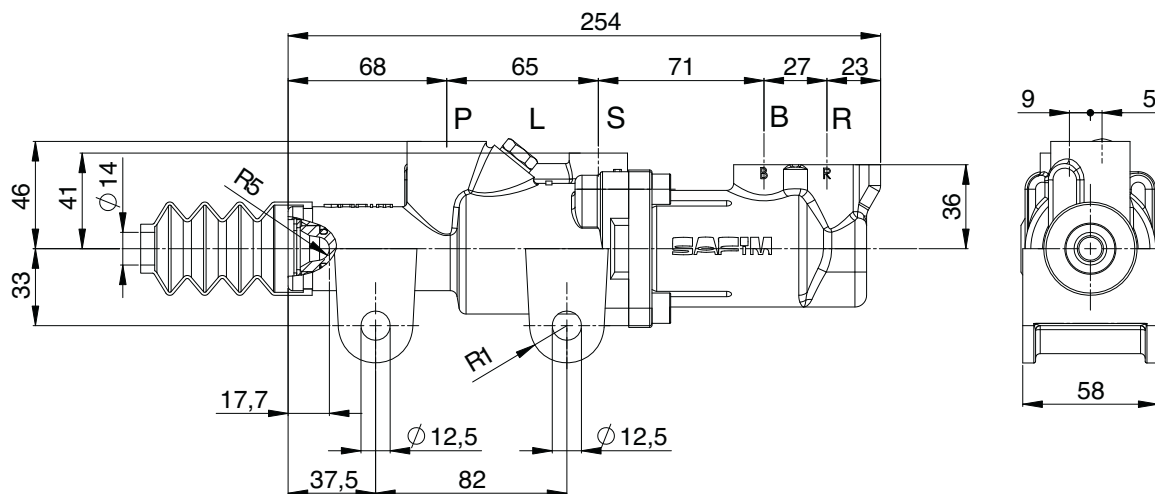
The master cylinders described in paragraph from 080.080 to 080.140 are equipped with a valve that connects them to the expander pot, opposite to the push-rod.

The correct assembling position of the master cylinder is vertical with push-rod turned downwards. This position makes the master cylinder self-bleeding.



SAFIM has produced a relevant compensation tank with great capacity (350cm³) to be connected to the head of the master cylinder directly.

Compensation tank + electric cap part number : **022481**

cod. 042405MN**Master Cylinder SINGLE CIRCUIT Ø31,75 with Closed Centre BOOSTER Ø34 for Mineral Oil****CONNECTIONS**

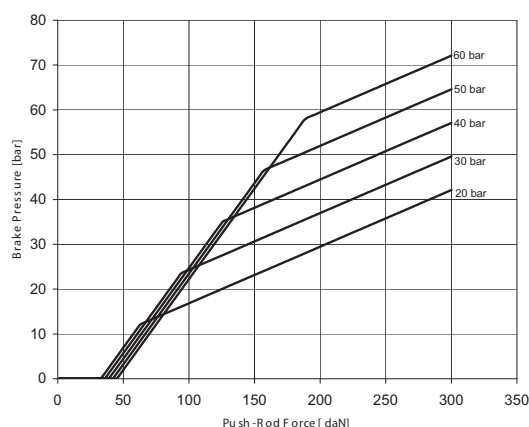
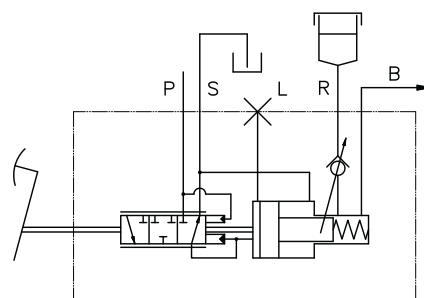
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

Piston diameter	31.75 mm
Displacement	30.9 cm³
Booster control piston diameter	34 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.15

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	80 bar
Booster side max pressure	80 bar
Max tank pressure	0.5 bar

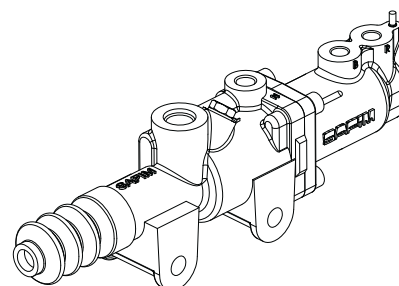
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER****04 2405 MN**

Product class = 04

Vertical assembly orientation = 2405

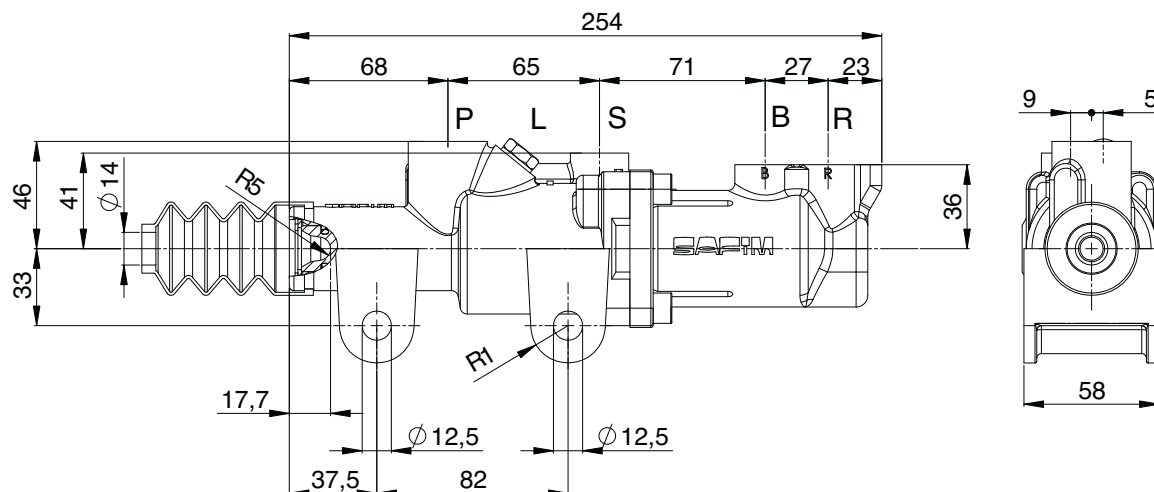
See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN



High reaction version cod. 042904MN

MNO version can be assembled on pedal 021678, see page 110.010

cod. 042569MN Master Cylinder SINGLE CIRCUIT Ø31,75 with Closed Centre BOOSTER Ø40 for Mineral Oil

CONNECTIONS

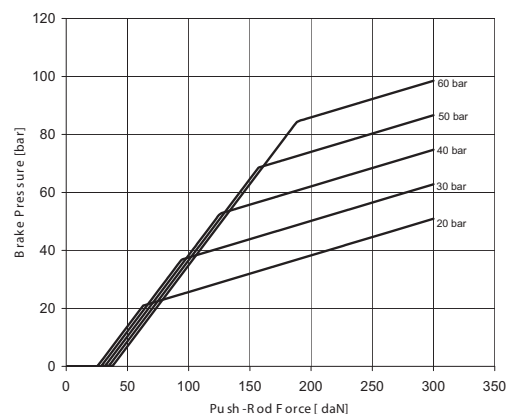
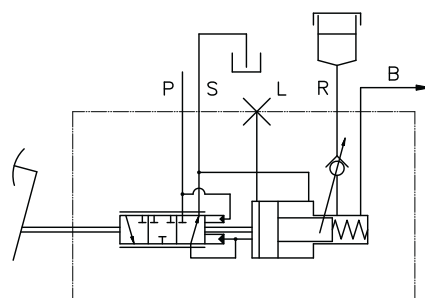
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

Piston diameter	31.75 mm
Displacement	30.9 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.59

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	80 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER
04 2569 MN

Product class = 04

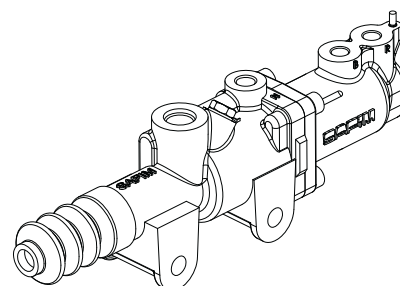
Vertical assembly orientation = 2569

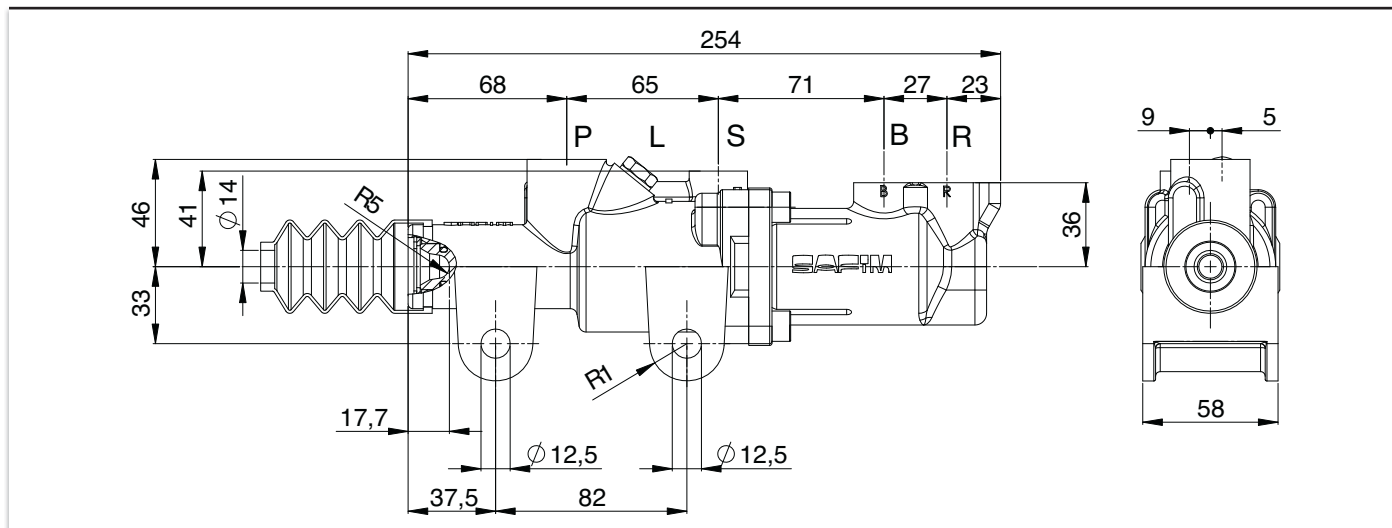
See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN

High reaction version cod. 042902MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 042570MN Master Cylinder SINGLE CIRCUIT Ø31,75 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

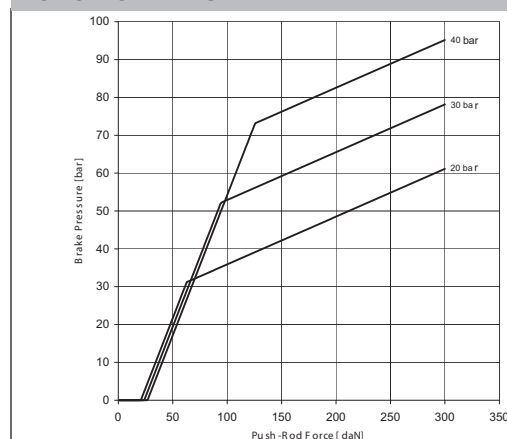
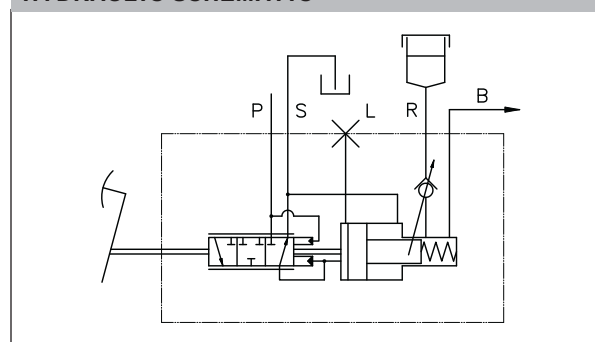
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

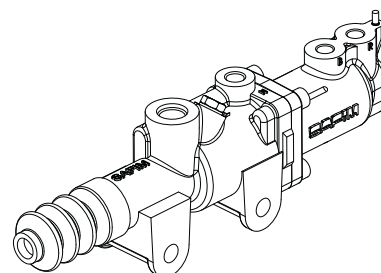
Piston diameter	31.75 mm
Displacement	30.9 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	2.10

WORKING CONDITIONS

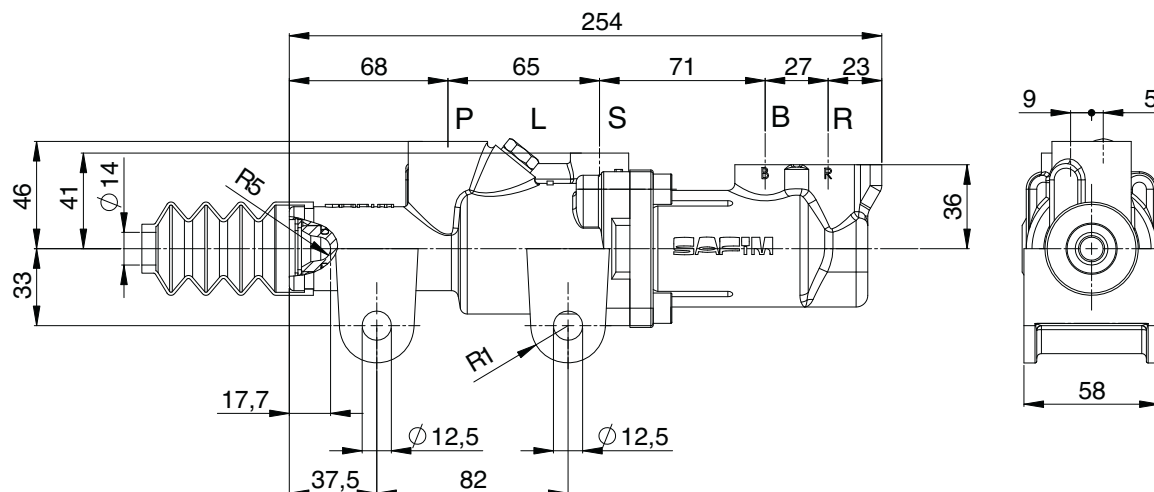
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	80 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	2570	MN	
Product class = 04			
Vertical assembly orientation = 2570			
Master cyl.side for mineral oil (DEXRON II) = MN			
See CODIFICATION TABLE 120.010			



High reaction version cod. 042905MN
 MNO version can be assembled on pedal 021678, see page 110.010

cod. 042571MN Master Cylinder SINGLE CIRCUIT Ø35 with Closed Centre BOOSTER Ø40 for Mineral Oil

CONNECTIONS

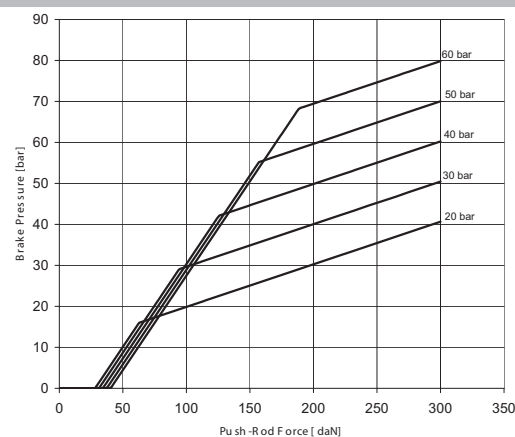
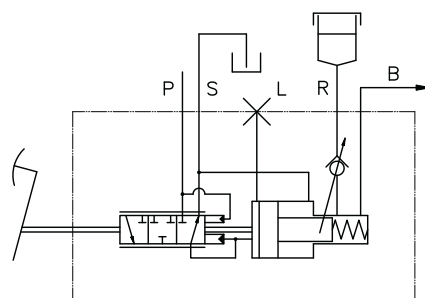
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	¼" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

Piston diameter	35 mm
Displacement	37.5 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.31

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	60 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER
04 2571 MN

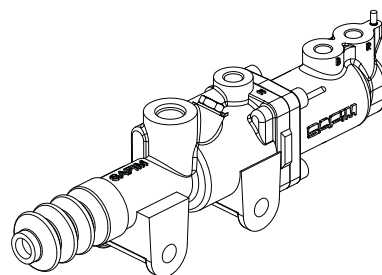
Product class = 04

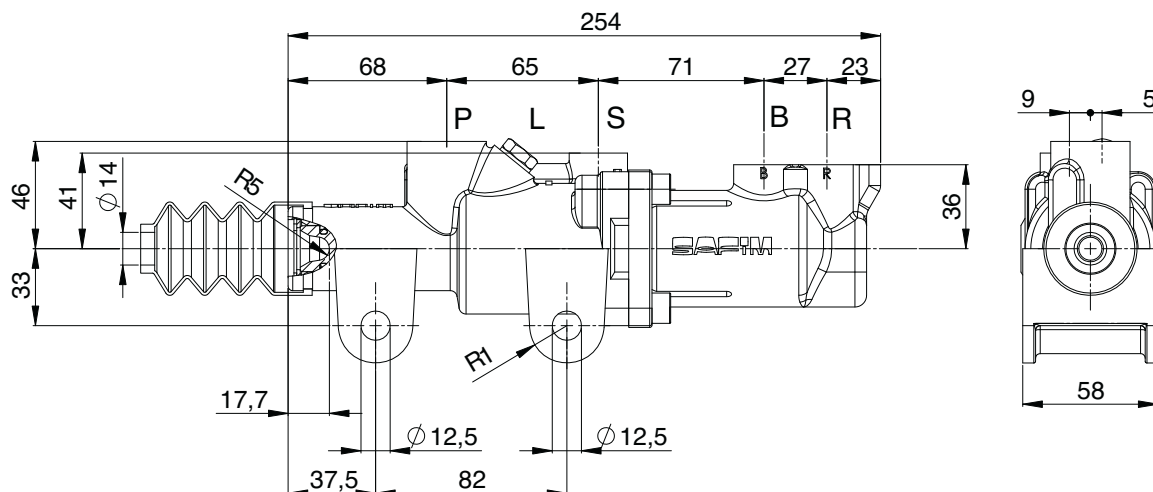
Vertical assembly orientation = 2571

See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 042572MN Master Cylinder SINGLE CIRCUIT Ø35 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

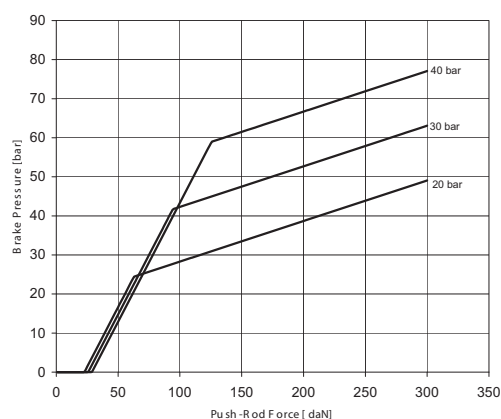
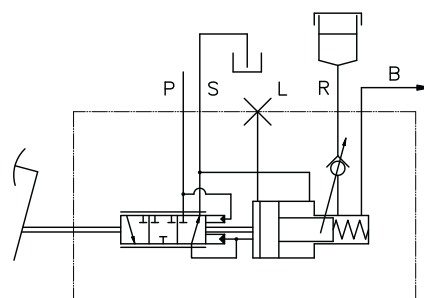
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

Piston diameter	35 mm
Displacement	37.5 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.73

WORKING CONDITIONS

Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	60 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

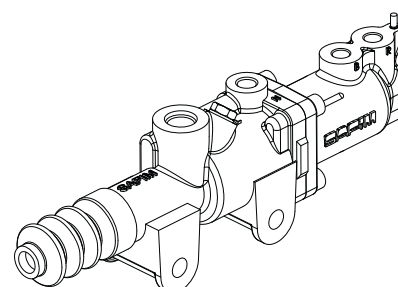
FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER
04 2572 MN

Product class = 04

Vertical assembly orientation = 2572

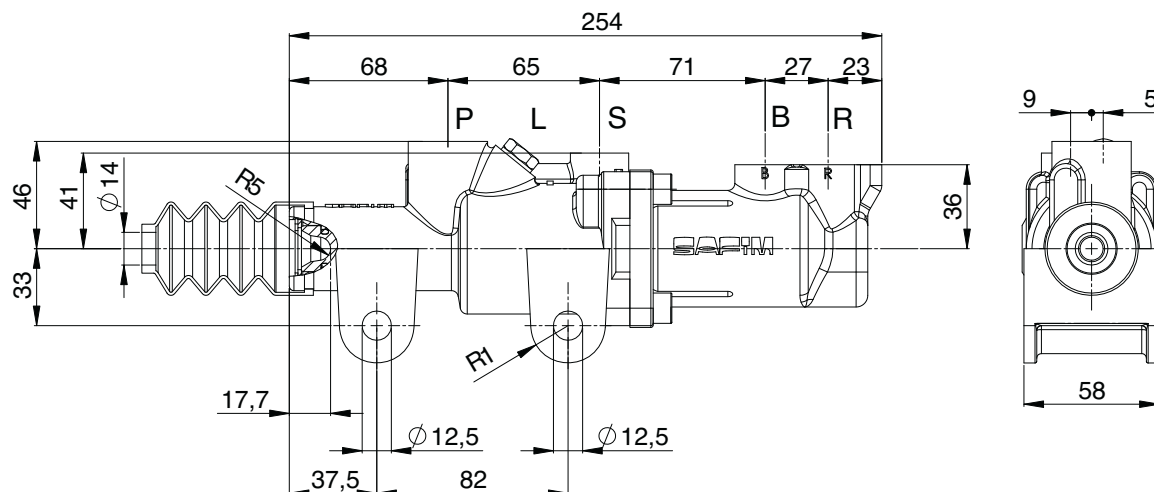
 See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN



High reaction version cod. 042905MN

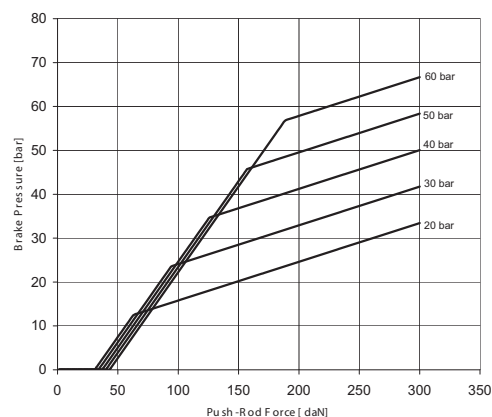
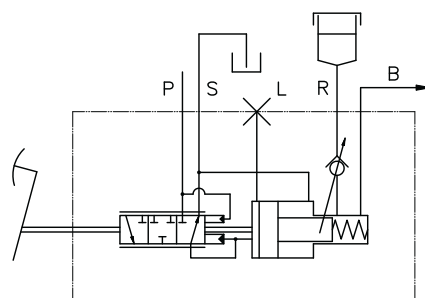
MNO version can be assembled on pedal 021678, see page 110.010

cod. 042573MN Master Cylinder SINGLE CIRCUIT Ø38 with Closed Centre BOOSTER Ø40 for Mineral Oil

CONNECTIONS

P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	¼" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

Piston diameter	38 mm
Displacement	44.2 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.11

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER
04 2573 MN

Product class = 04

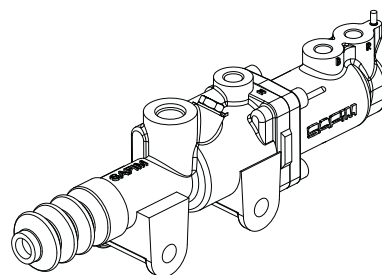
Vertical assembly orientation = 2573

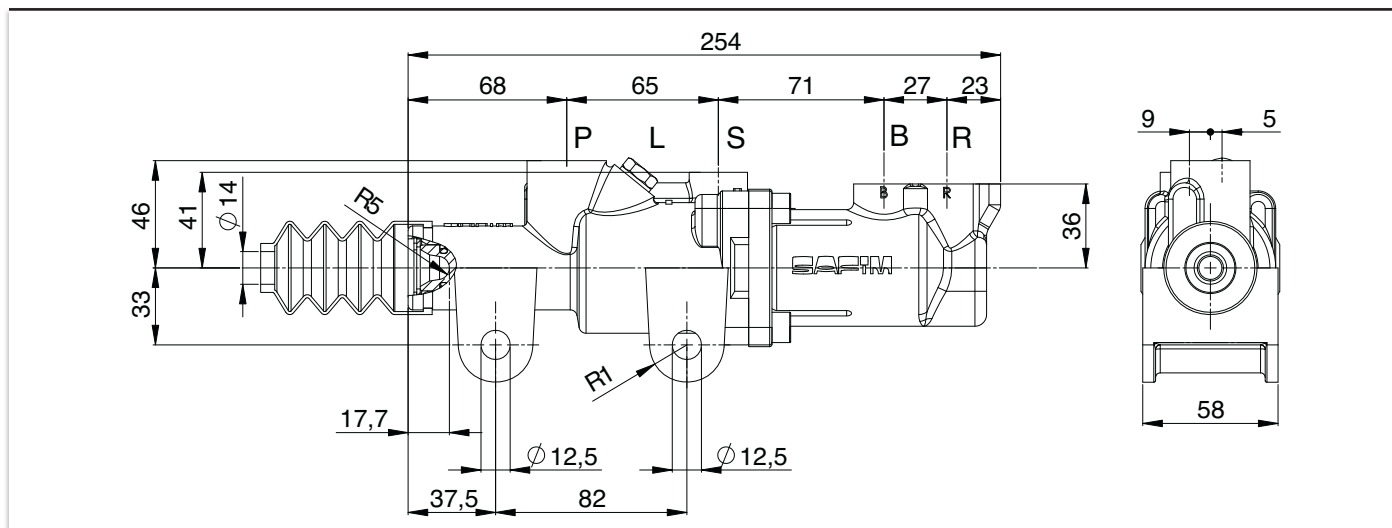
See CODIFICATION
TABLE 120.010

Master cyl.side for mineral oil (DEXRON II) = MN

High reaction version cod. 042906MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 042574MN Master Cylinder SINGLE CIRCUIT Ø38 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

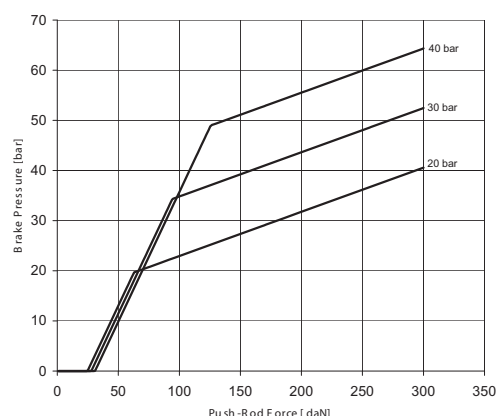
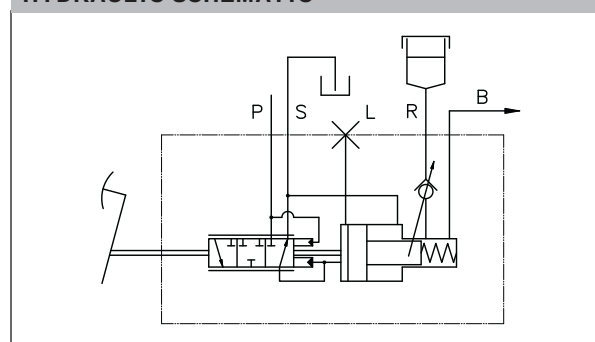
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R	Master cylinder filling	M12x1.5
B	Connection to brakes	M12x1.5

TECHNICAL FEATURES

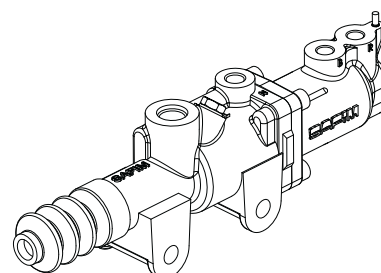
Piston diameter	38 mm
Displacement	44.2 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	40 mm
Ratio between 1st circuit and booster area	1.47

WORKING CONDITIONS

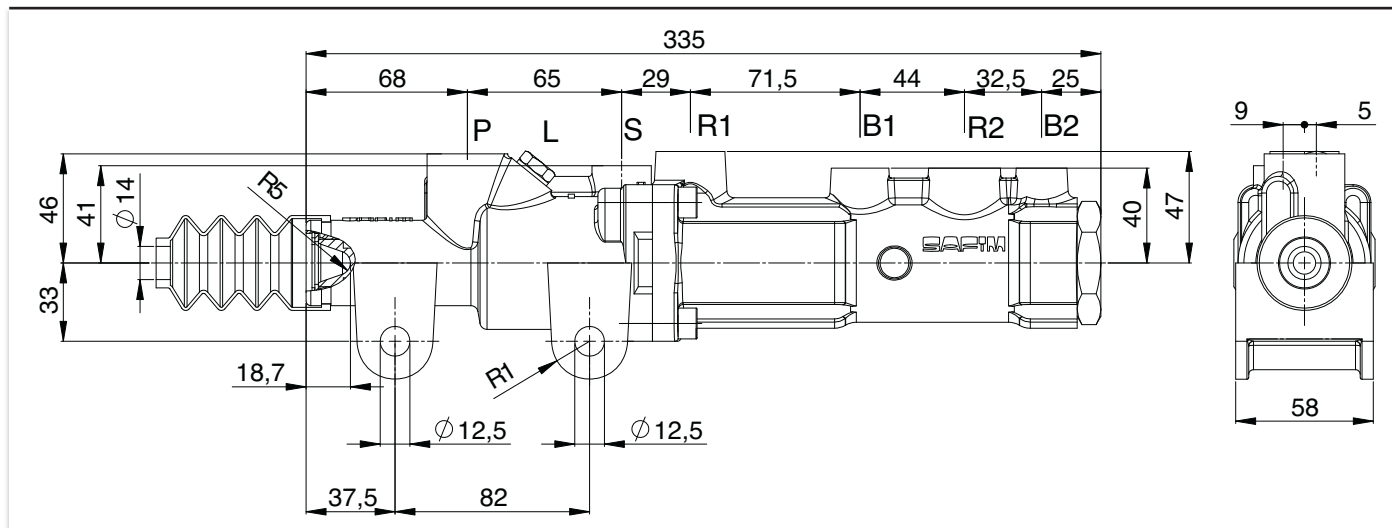
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	50 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	2574	MN	
Product class = 04			
Vertical assembly orientation = 2574			See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	



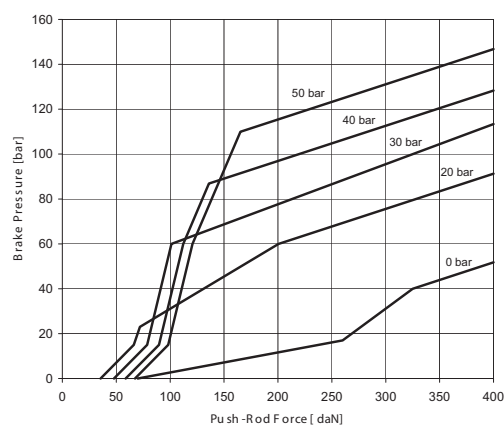
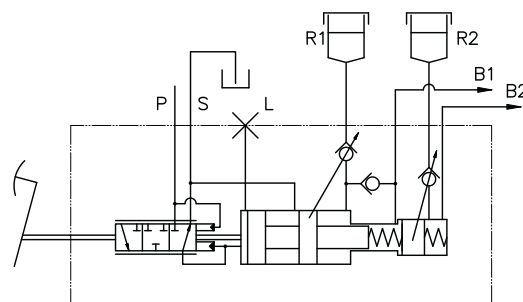
High reaction version cod. 042907MN
MNO version can be assembled on pedal 021678, see page 110.010

cod. 051971MN**Step Bore Master Cylinder DUAL CIRCUIT Ø38/25 -
Ø31,75 with Closed Centre BOOSTER Ø40 for Mineral Oil****CONNECTIONS**

P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

1st circuit piston diameter	38/25 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	5/30 cm ³
2nd circuit displacement	13.5 cm ³
Total displacement	18.5/43.5 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	22 mm
2nd circuit stroke	18 mm
Ratio between 1st circuit and booster area	2.56
Ratio between 2nd circuit and booster area	1.58

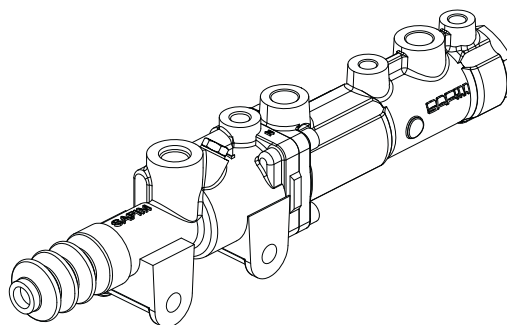
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****WORKING CONDITIONS**

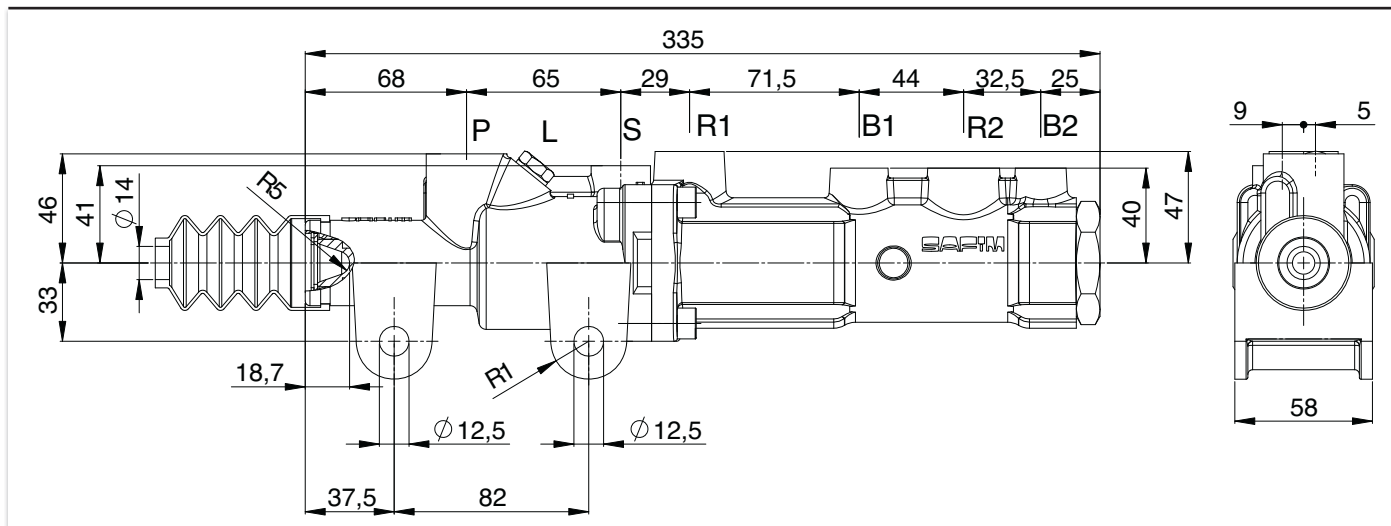
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

ORDER PART NUMBER

05	1971	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1971		See CODIFICATION TABLE 120.010
		Master cylinder side for brake fluid (DOT 4) = FN	
		Master cyl.side for mineral oil (DEXRON II) = MN	

MNO versions can be assembled on pedal 021678, see page 110.010



cod. 052072MN Step Bore Master Cylinder DUAL CIRCUIT Ø38/25 - Ø31,75 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

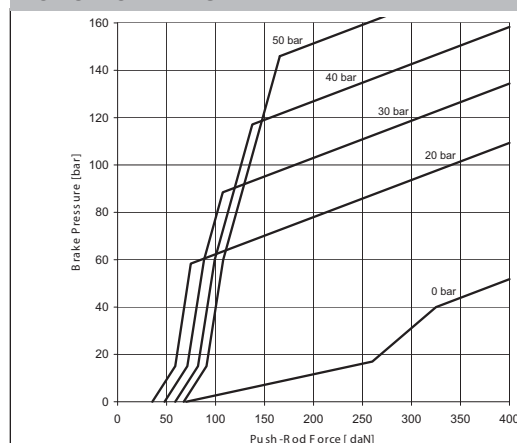
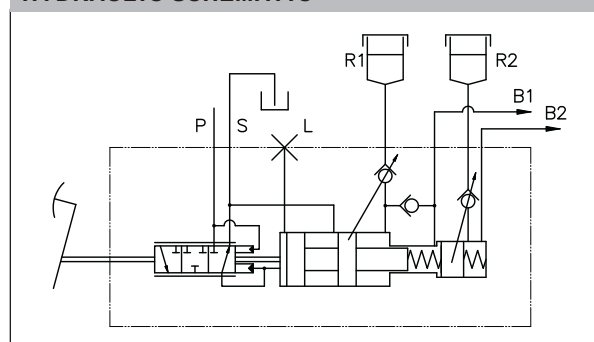
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

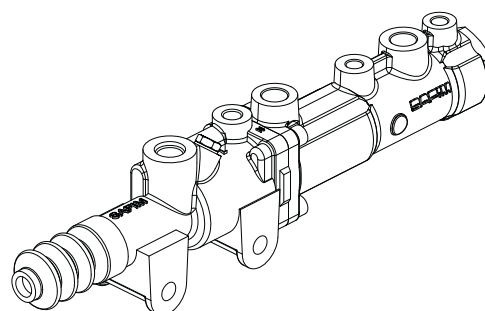
1st circuit piston diameter	38/25 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	5/30 cm ³
2nd circuit displacement	13.5 cm ³
Total displacement	18.5/43.5 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	22 mm
2nd circuit stroke	18 mm
Ratio between 1st circuit and booster area	3.3
Ratio between 2nd circuit and booster area	2.1

WORKING CONDITIONS

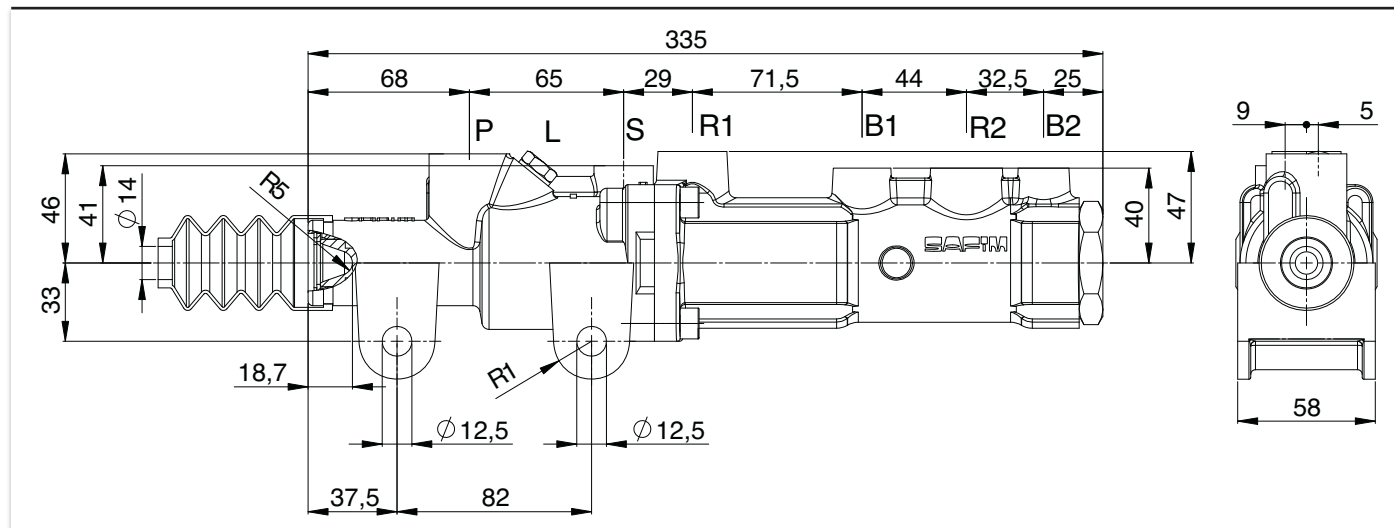
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

05	2072	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 2072		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	



MNO versions can be assembled on pedal 021678, see page 110.010

cod. 051613 MN**Step Bore Master Cylinder DUAL CIRCUIT Ø40/30 - Ø35
with Closed Centre BOOSTER Ø40 for Mineral Oil****CONNECTIONS**

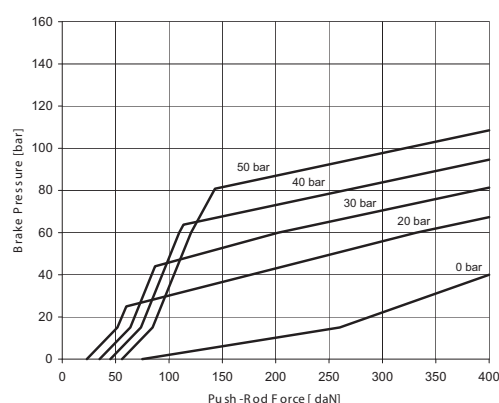
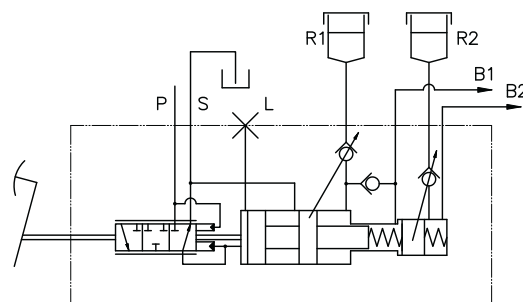
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

1st circuit piston diameter	40/30 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	8.5/30 cm ³
2nd circuit displacement	18 cm ³
Total displacement	26.5/48 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.77
Ratio between 2nd circuit and booster area	1.3

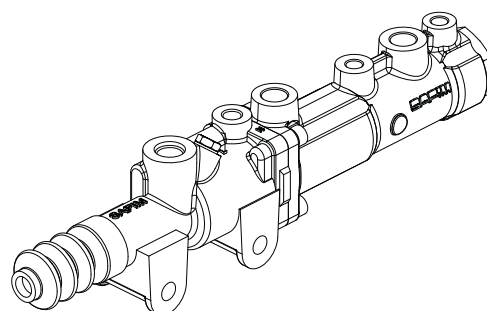
WORKING CONDITIONS

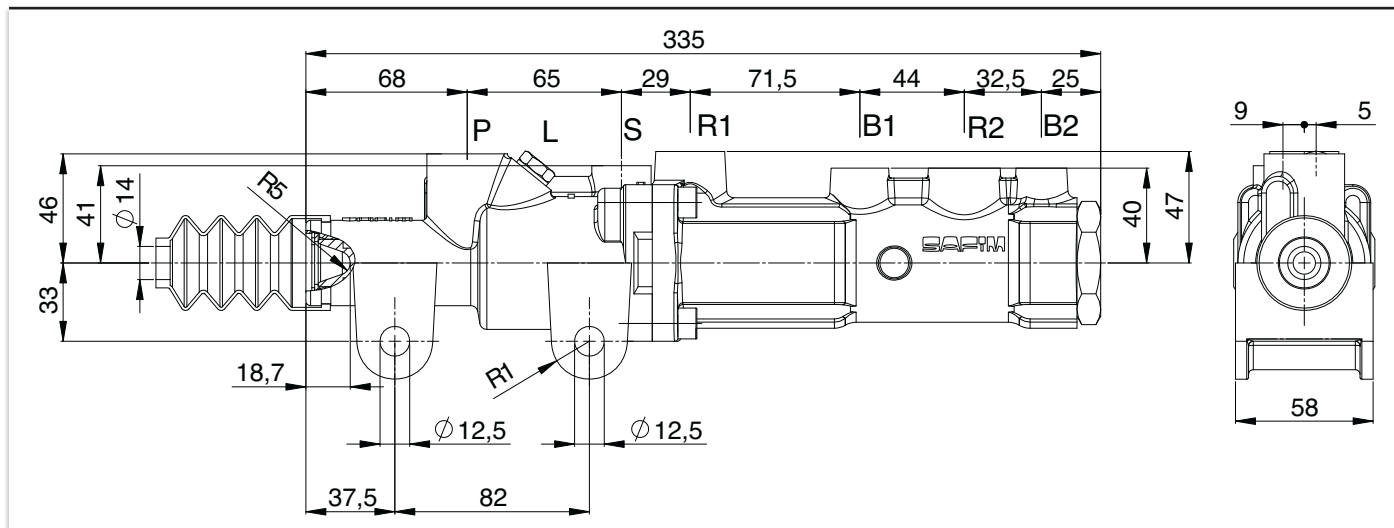
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

05	1613	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1613		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	

MNO versions can be assembled on pedal 021678, see page 110.010



cod. 051615 MN**Step Bore Master Cylinder DUAL CIRCUIT Ø40/30 - Ø35
with Closed Centre BOOSTER Ø46 for Mineral Oil****CONNECTIONS**

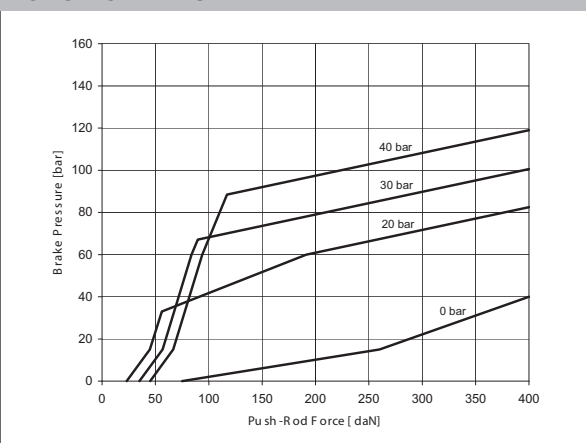
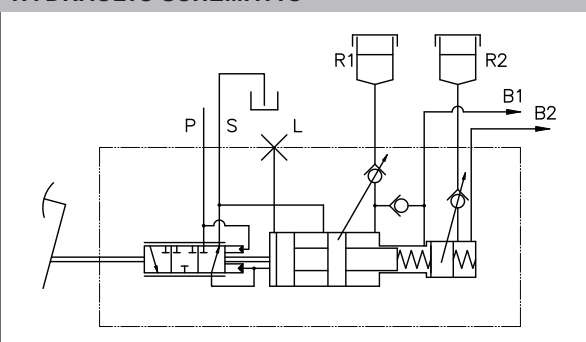
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5 ISO 6149
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5 ISO 6149
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

1st circuit piston diameter	40/30 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	8.5/30 cm ³
2nd circuit displacement	18 cm ³
Total displacement	26.5/48 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	2.35
Ratio between 2nd circuit and booster area	1.72

WORKING CONDITIONS

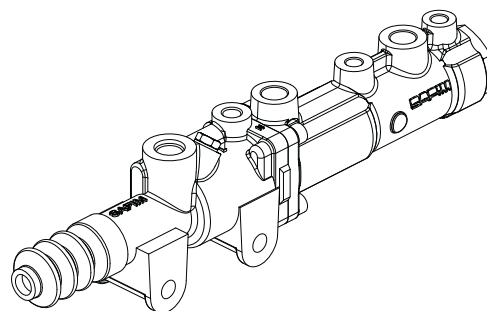
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

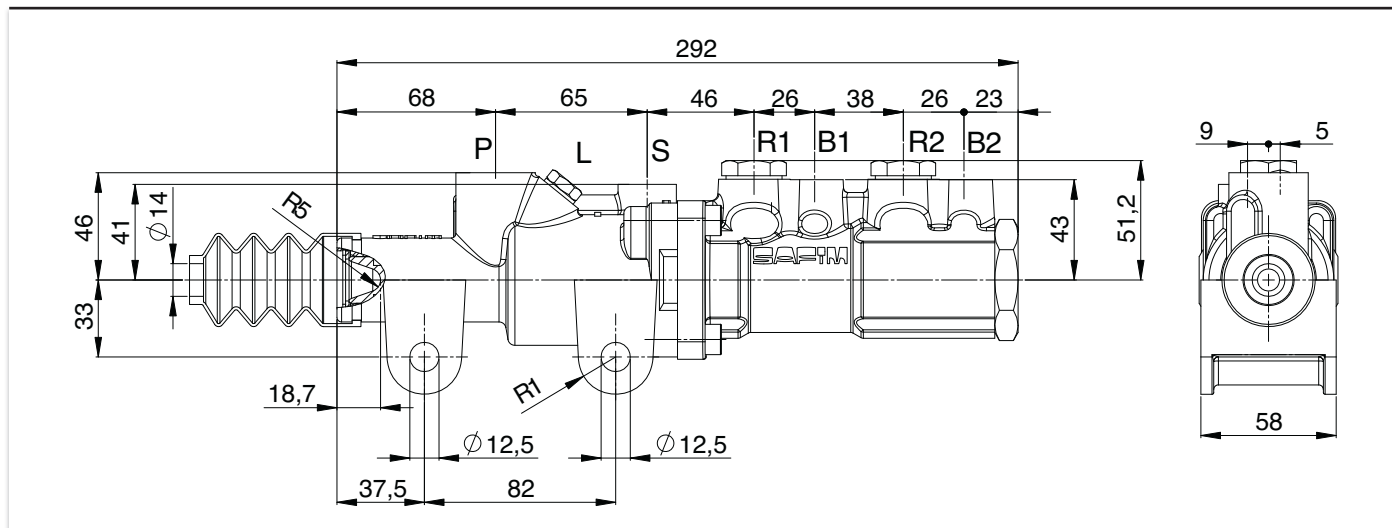
FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

05	1615	MN	
Product class = 05			
Horizontal/Vertical assembly orientation master cylinder	= 1615		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	

High reaction version cod. 053055MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 041772 MN**Master Cylinder DUAL CIRCUIT Ø25 with Closed Centre BOOSTER Ø40 for Mineral Oil****CONNECTIONS**

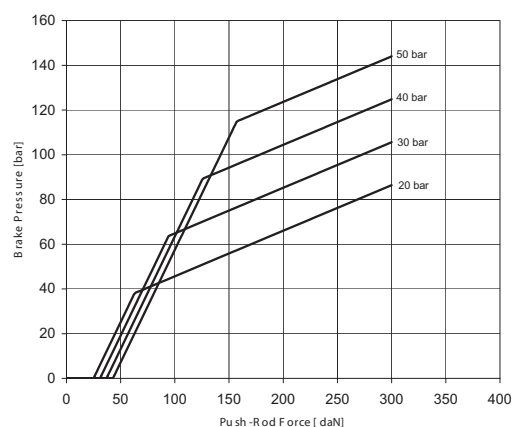
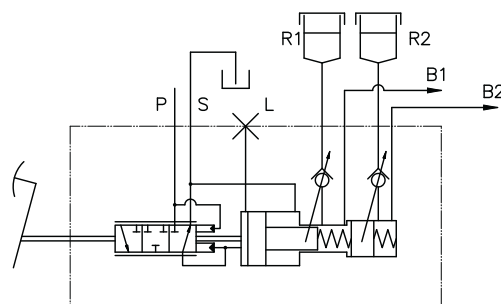
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	¼" Gas
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M10x1.25
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M12x1.25

TECHNICAL FEATURES

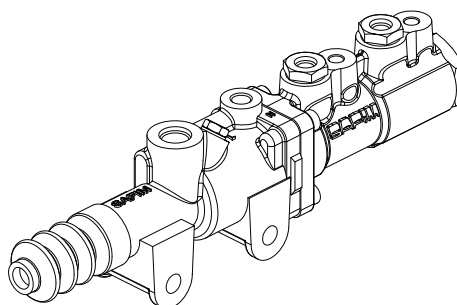
1st circuit piston diameter	25 mm
2nd circuit piston diameter	29 mm
1st circuit displacement	9 cm³
2nd circuit displacement	9.5 cm³
Total displacement	18.5 cm³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	24.5 mm
2nd circuit stroke	15.5 mm
Ratio between 1st circuit and booster area	2.56
Ratio between 2nd circuit and booster area	1.9

WORKING CONDITIONS

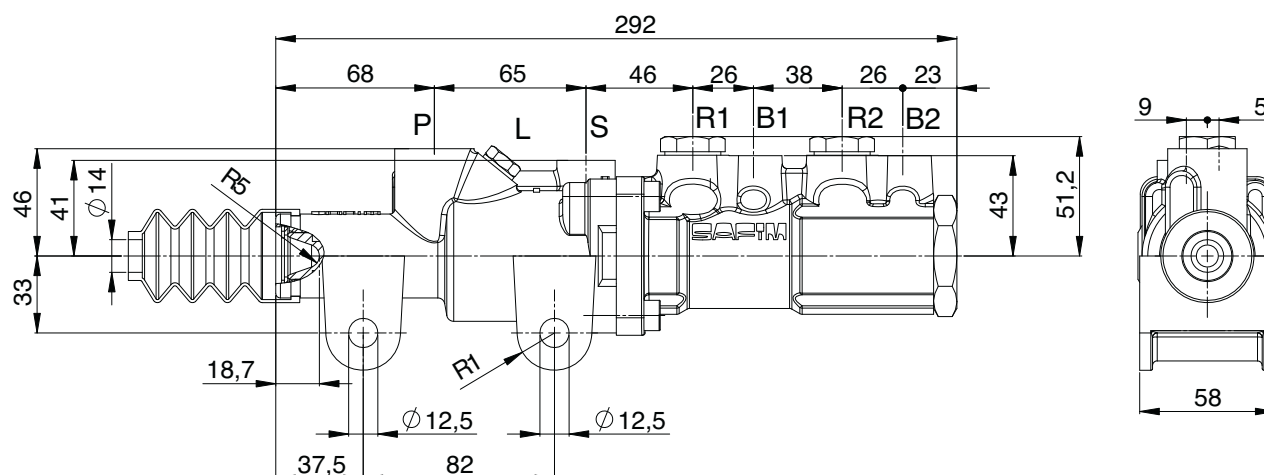
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

04	1772	MN	
Product class = 04			
Horizontal assembly orientation = 1772			See CODIFICATION TABLE 120.010
Vertical assembly orientation = ****			
Master cyl.side for mineral oil (DEXRON II) = MN			



MNO version can be assembled on pedal 021678, see page 110.010

cod. 041773 MN Master Cylinder DUAL CIRCUIT Ø25 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

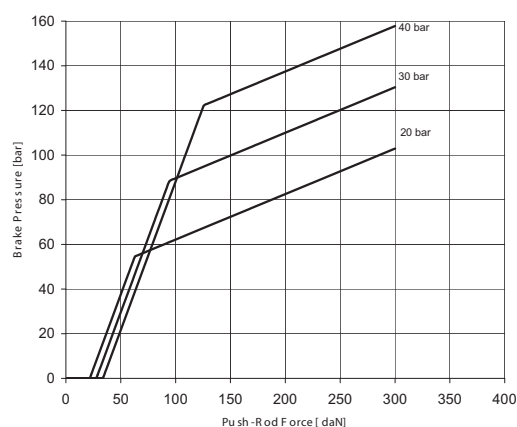
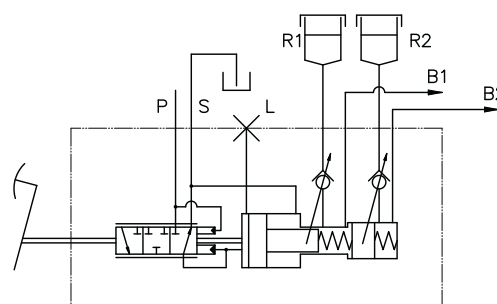
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M12x1.5 ISO 6149
B1	Connection to brakes	M10x1.25
R2	Master cylinder filling	M12x1.5 ISO 6149
B2	Connection to brakes	M10x1.25

TECHNICAL FEATURES

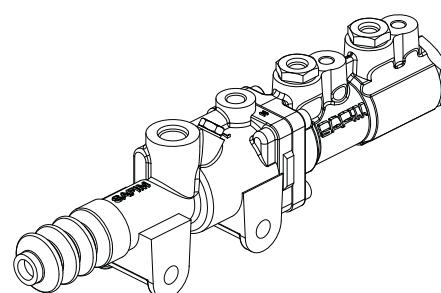
1st circuit piston diameter	25 mm
2nd circuit piston diameter	29 mm
1st circuit displacement	9 cm ³
2nd circuit displacement	9.5 cm ³
Total displacement	18.5 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	24.5 mm
2nd circuit stroke	15.5 mm
Ratio between 1st circuit and booster area	3.3
Ratio between 2nd circuit and booster area	2.5

WORKING CONDITIONS

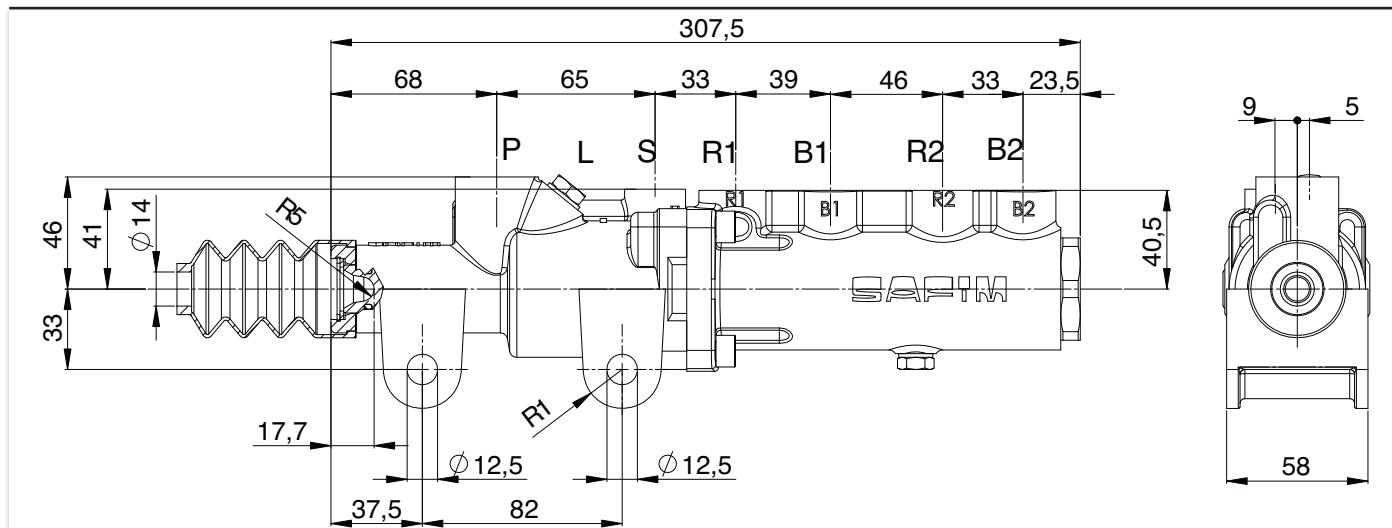
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	150 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	1773	MN	
Product class = 04			
Horizontal assembly orientation = 1773			See CODIFICATION TABLE 120.010
Vertical assembly orientation = ****			
Master cyl.side for mineral oil (DEXRON II) = MN			



MNO version can be assembled on pedal 021678, see page 110.010

cod. 043000MN Master Cylinder DUAL CIRCUIT Ø31,75 with Closed Centre BOOSTER Ø40 for Mineral Oil

CONNECTIONS

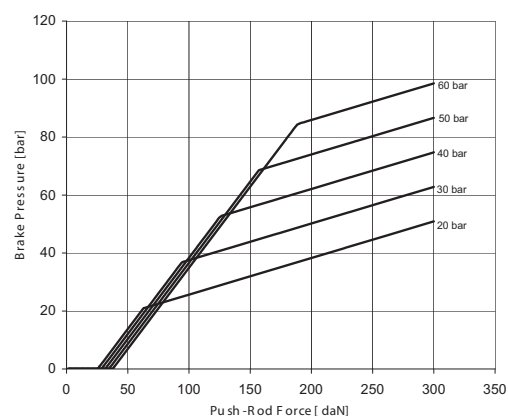
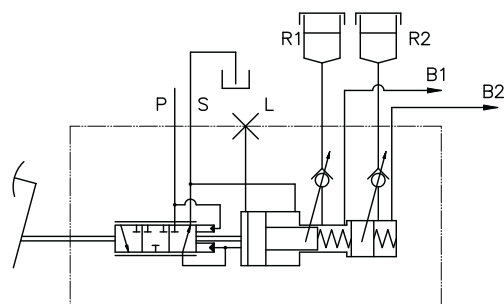
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

1st circuit piston diameter	31.75 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	14.3 cm ³
2nd circuit displacement	14.3 cm ³
Total displacement	28.6 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.6
Ratio between 2nd circuit and booster area	1.6

WORKING CONDITIONS

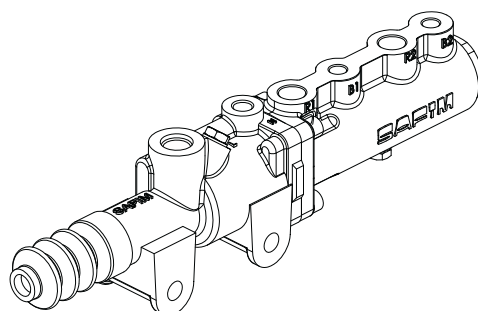
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	80 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

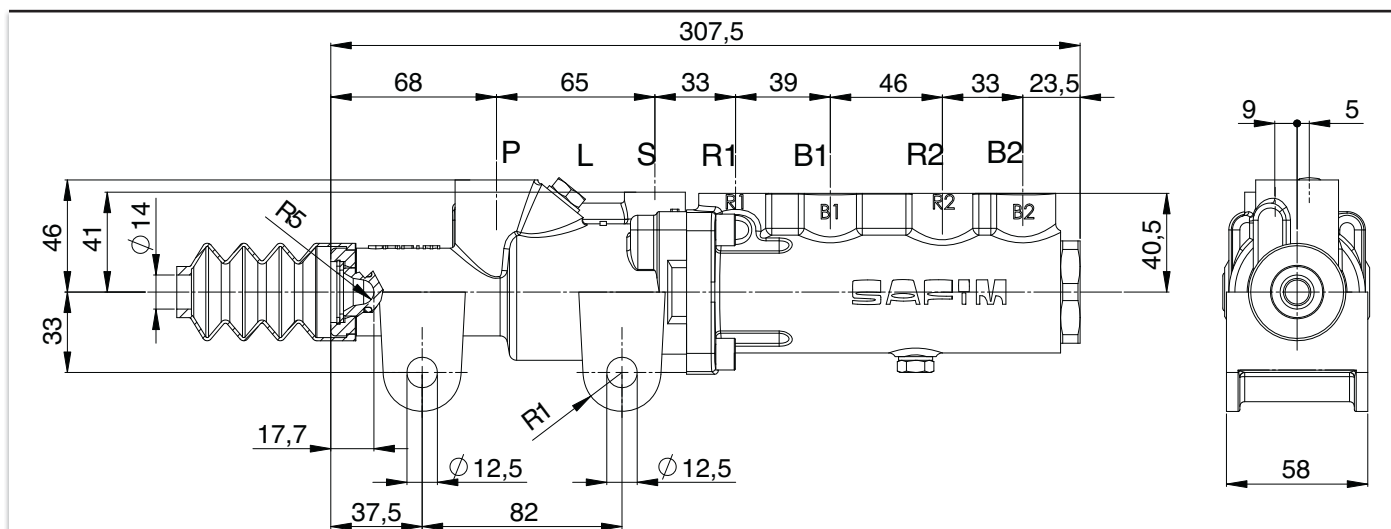
FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	3000	MN	
Product class = 04			
Horizontal/Vertical assembly orientation master cylinder	= 3000		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	

High reaction version cod. 043001MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 043002MN Master Cylinder DUAL CIRCUIT Ø31,75 with Closed Centre BOOSTER Ø46 for Mineral Oil

CONNECTIONS

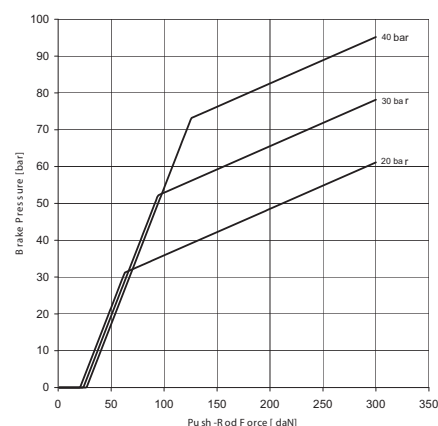
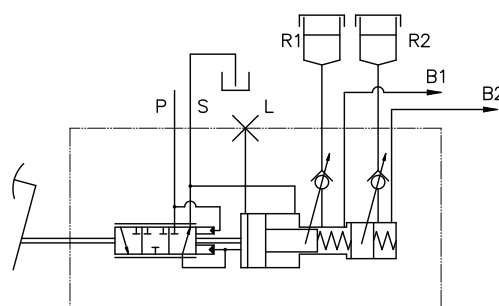
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

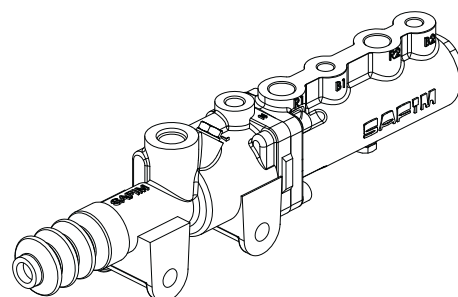
1st circuit piston diameter	31.75 mm
2nd circuit piston diameter	31.75 mm
1st circuit displacement	14.3 cm ³
2nd circuit displacement	14.3 cm ³
Total displacement	28.6 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	2.1
Ratio between 2nd circuit and booster area	2.1

WORKING CONDITIONS

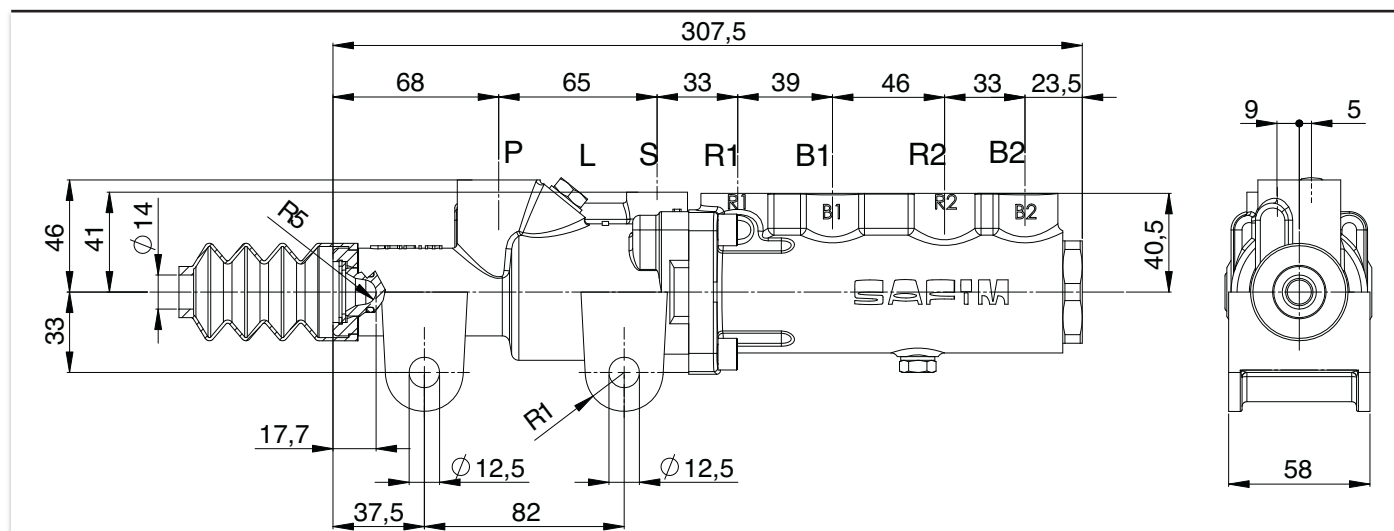
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	80 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	3002	MN	
Product class = 04			
Horizontal/Vertical assembly orientation master cylinder	= 3002		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	



High reaction version cod. 043003MN
MNO version can be assembled on pedal 021678, see page 110.010

cod. 043004MN Master Cylinder DUAL CIRCUIT Ø35 with Closed Centre BOOSTER Ø40 for Mineral Oil

CONNECTIONS

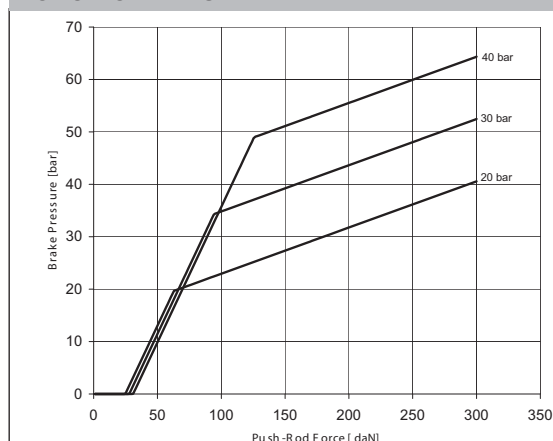
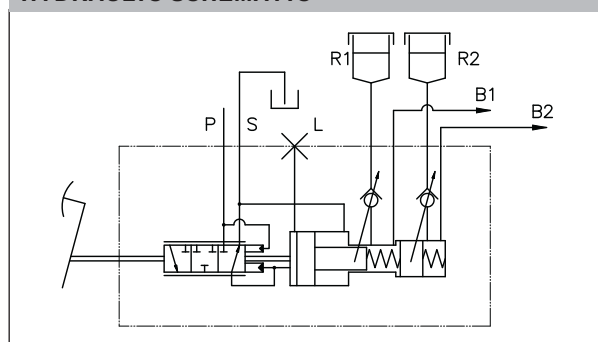
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	¼" Gas
R1	Master cylinder filling	M18x1.5
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

1st circuit piston diameter	35 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	17.3 cm ³
2nd circuit displacement	17.3 cm ³
Total displacement	34.6 cm ³
Booster control piston diameter	40 mm
Push-rod stroke	43 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.3
Ratio between 2nd circuit and booster area	1.3

WORKING CONDITIONS

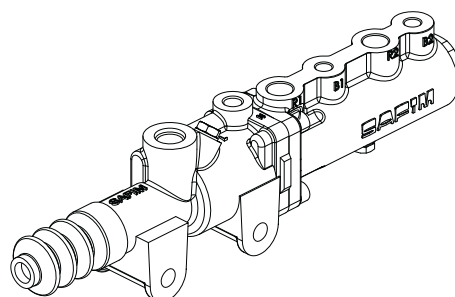
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	60 bar
Booster side max pressure	60 bar
Max tank pressure	0.5 bar

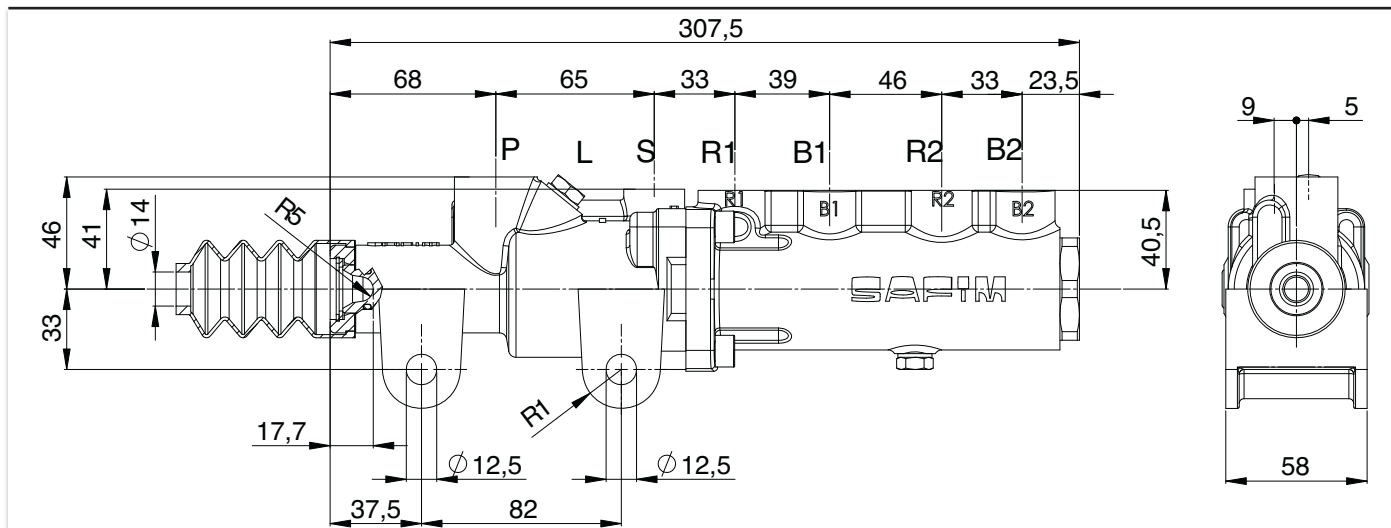
FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC

ORDER PART NUMBER

04	3004	MN	
Product class = 04			
Horizontal/Vertical assembly orientation master cylinder	= 3004		See CODIFICATION TABLE 120.010
		Master cyl.side for mineral oil (DEXRON II) = MN	

High reaction version cod. 043005MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 043006MN**Master Cylinder DUAL CIRCUIT Ø35 with Closed Centre
BOOSTER Ø46 for Mineral Oil****CONNECTIONS**

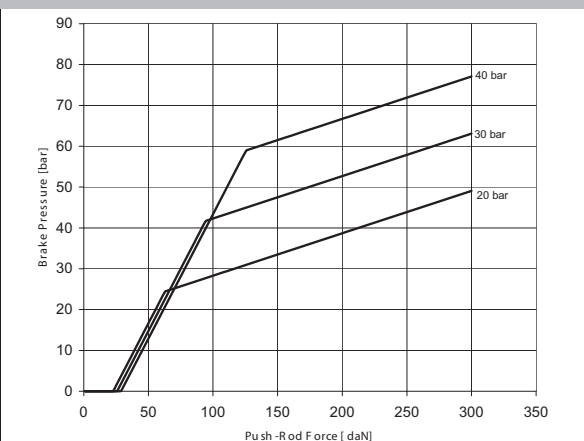
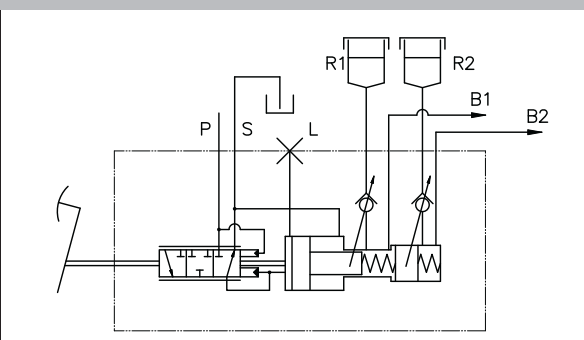
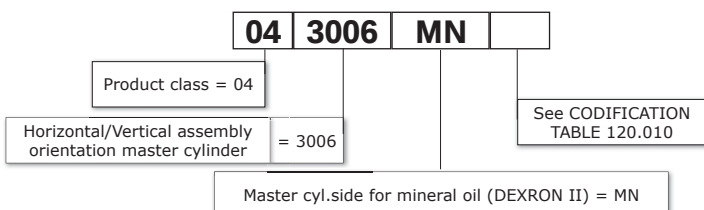
P	Booster feeding	M18x1.5 ISO 6149
L	LS signal port	M10x1
S	Tank port	1/4" Gas
R1	Master cylinder filling	M18x1.5
B1	Connection to brakes	M12x1.5
R2	Master cylinder filling	M18x1.5
B2	Connection to brakes	M12x1.5

TECHNICAL FEATURES

1st circuit piston diameter	35 mm
2nd circuit piston diameter	35 mm
1st circuit displacement	17.3 cm ³
2nd circuit displacement	17.3 cm ³
Total displacement	34.6 cm ³
Booster control piston diameter	46 mm
Push-rod stroke	43 mm
1st circuit stroke	20 mm
2nd circuit stroke	20 mm
Ratio between 1st circuit and booster area	1.7
Ratio between 2nd circuit and booster area	1.7

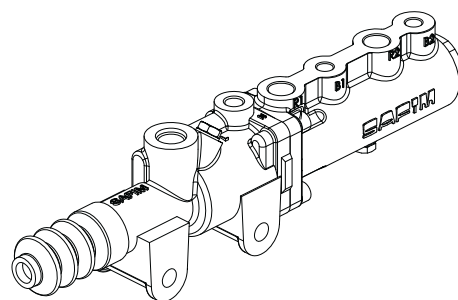
WORKING CONDITIONS

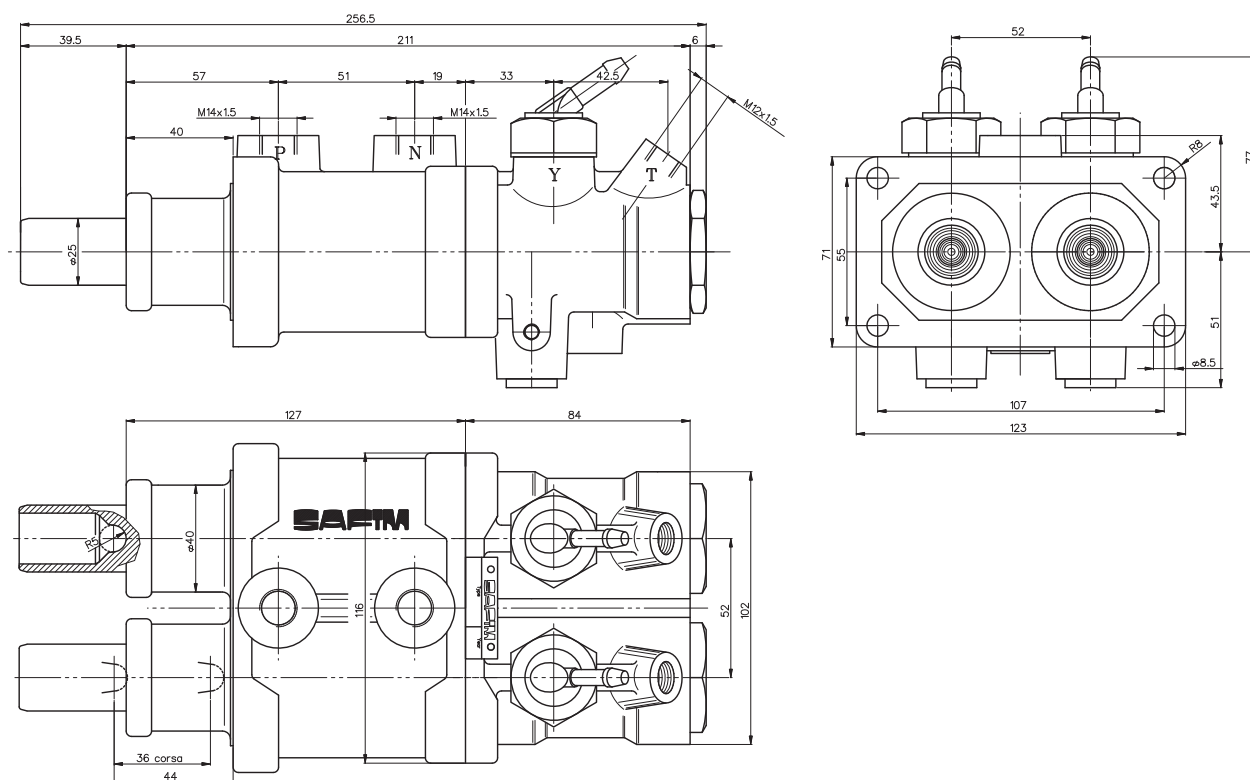
Booster feeding fluid : hydraulic oil	SAE 10-20
Booster oil filtration degree	NAS 1638 class 9
Oil temperature range (mineral oil)	-20° ÷ +90°C
Master cylinder side max pressure	60 bar
Booster side max pressure	40 bar
Max tank pressure	0.5 bar

FUNCTION DIAGRAM**HYDRAULIC SCHEMATIC****ORDER PART NUMBER**

High reaction version cod. 043007MN

MNO version can be assembled on pedal 021678, see page 110.010



cod. 0 415 3 2 MN **Balanced Master Cylinder TWIN CIRCUIT Ø25 with Closed Centre BOOSTER Ø48 for Mineral Oil**

CONNECTIONS

P	Oil inlet	M14x1.5
N	Tank	M14x1.5
Y	Compensation Tank	
T	Brakes	M12x1.5

TECHNICAL FEATURES

Stroke	36 mm
Unitarian displacement	17 cm ³
Booster control piston diameter	48 mm
Master cylinder piston diameter	25 mm
Ratio between master cyl. and booster area	1/3.5
Weight	9 kg

Note : The compensation valve is open after 4 mm of stroke

WORKING CONDITIONS

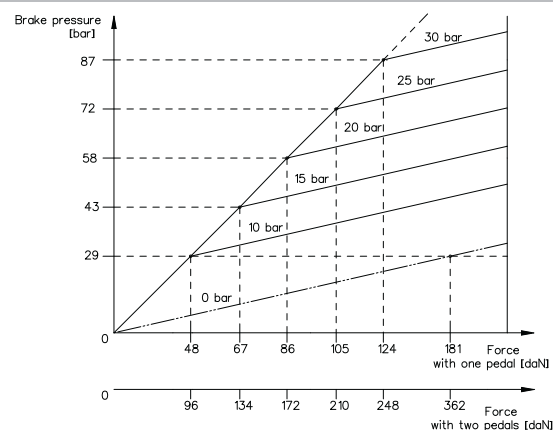
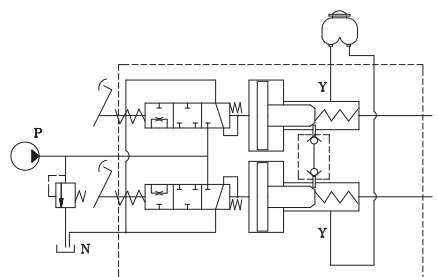
Oil type	Brake circuit : HYDRAULIC OIL – DEXRON – LHM
	Booster circuit : HYDRAULIC OIL SAE 10-20
Max brakes pressure	120 bar
Max booster pressure	33 bar
Temperature range	-20°C / +80 °C

ORDER PART NUMBER
04 1532 MN

Product class = 04

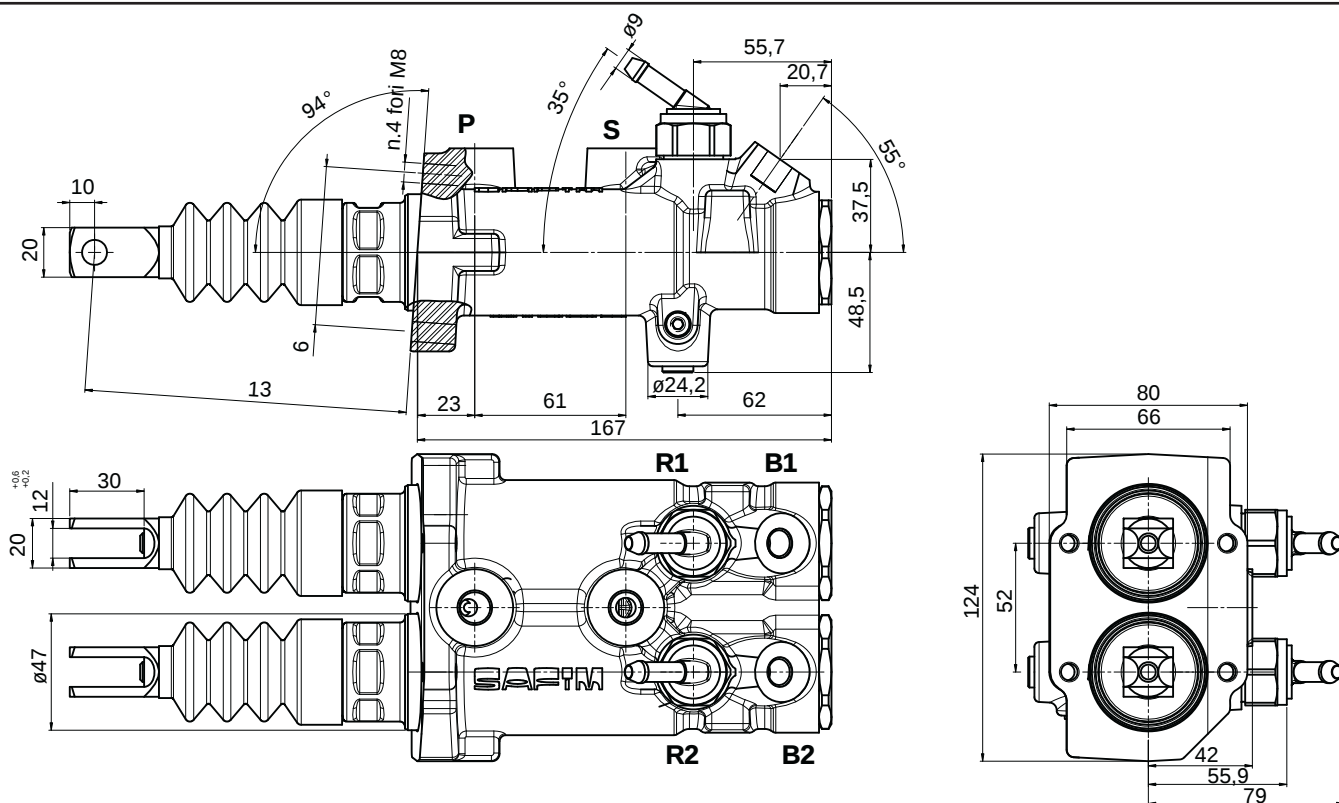
 Horizontal/Vertical assembly
orientation master cylinder = 1532

Master cyl.side for mineral oil (DEXRON II) = MN

FUNCTION DIAGRAM

HYDRAULIC SCHEMATIC


cod. 042744MN

Balanced Master Cylinder TWIN CIRCUIT Ø28 with Closed Centre BOOSTER Ø40 for Mineral Oil



CONNECTIONS

P	Oil inlet	M14x1.5
S	Tank	M14x1.5
B1,B2	Front brakes	M12x1.5
R1,R2	Compensation Tank	

TECHNICAL FEATURES

Piston stroke	36 mm
Push-rod stroke	37,5 mm
Total displacement	42 cm ³
Piston diameter	28 mm
Booster diameter	40 mm
Ratio between booster and piston area	2.04

WORKING CONDITIONS

Oil type	Brake circuit : HYDRAULIC OIL – DEXRON – LHM
	Booster circuit : HYDRAULIC OIL SAE 10-20
Max brakes pressure	120 bar
Max booster pressure	60 bar
Temperature range	-20°C / +80 °C

ORDER PART NUMBER

04	2744	MN
----	------	----

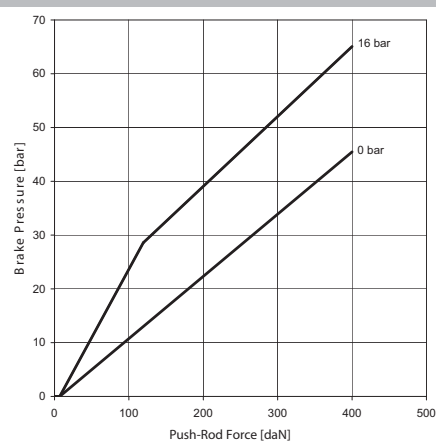
Product class = 04

Horizontal assembly
orientation master cylinder

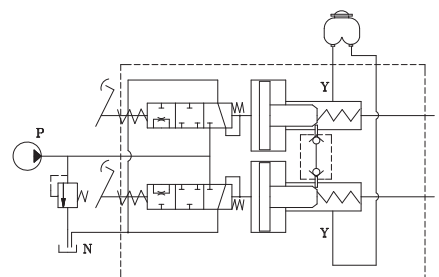
$$= 2744$$

Master cyl.side for mineral oil (DEXRON II) = MN

FUNCTION DIAGRAM

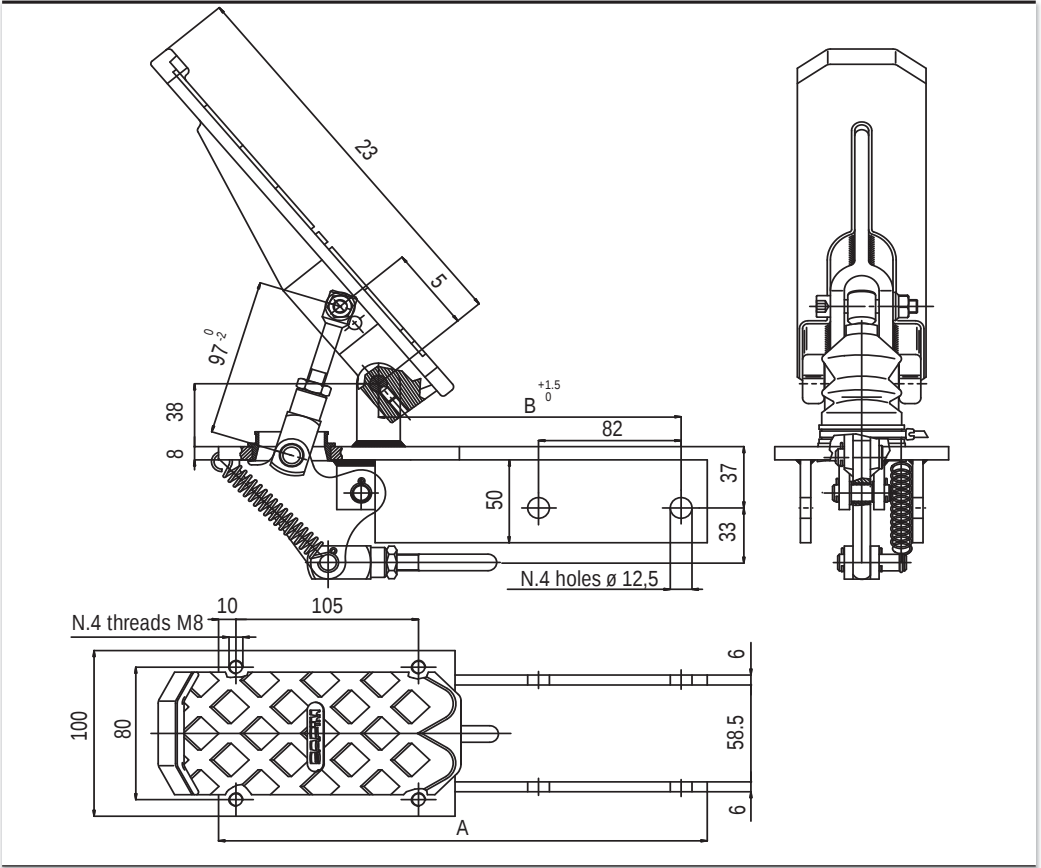


HYDRAULIC SCHEMATIC



HORIZONTAL
PEDAL
ASSEMBLY

Cod.	021678	022193
A	281	359
B	174	252
ASSEMBLY OF ø38, ø40 and ø46 BOOSTER MASTER CYLINDERS	Open centre booster	Open centre booster with accumu- lator
	Closed centre booster for mi- neral oil	Closed centre booster
OPTIO- NAL RE- QUESTED (see page 120.010)	O	R

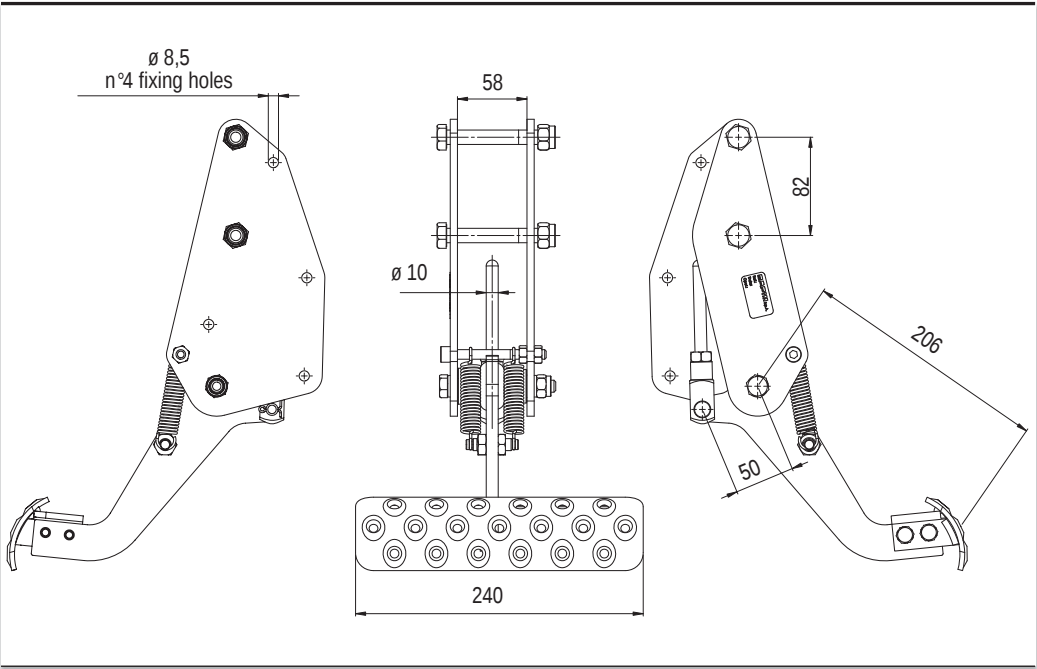


VERTICAL
PEDAL
ASSEMBLY

Cod.	023611
------	--------

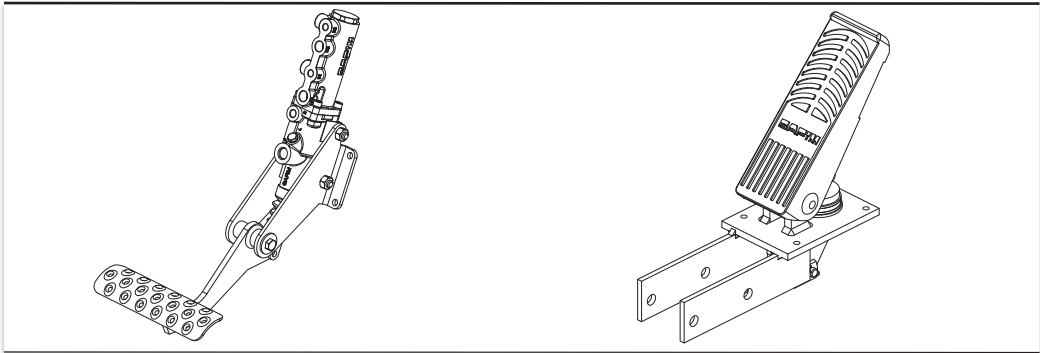
For assembly of ø38,
ø40 and ø46 Booster
Master Cylinders

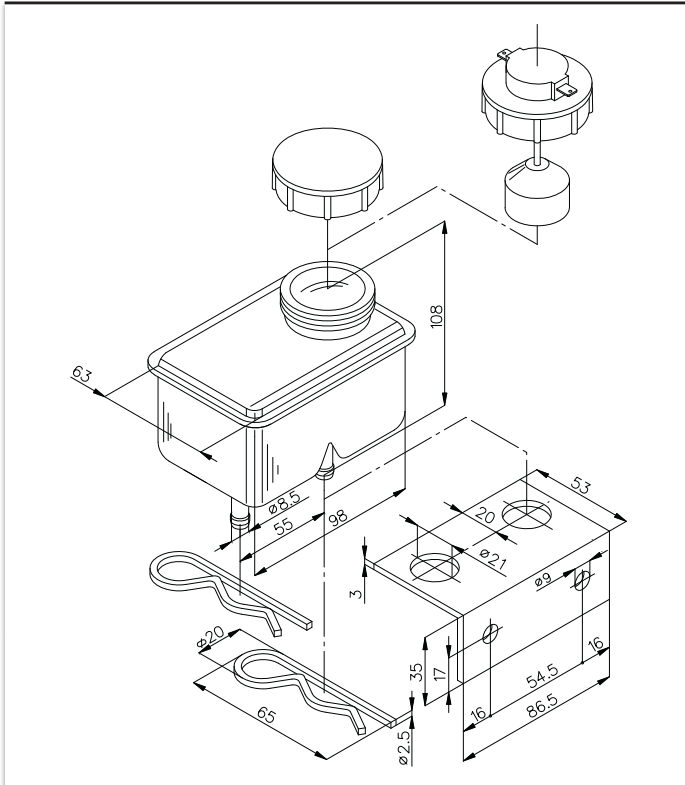
- Open centre booster
- Closed centre booster for mineral oil
- Available for all kinds of master cylinder with booster



OTHER PEDAL
ASSEMBLIES
ARE AVAILABLE

contact SAFIM for infor-
mations



**RO15319**

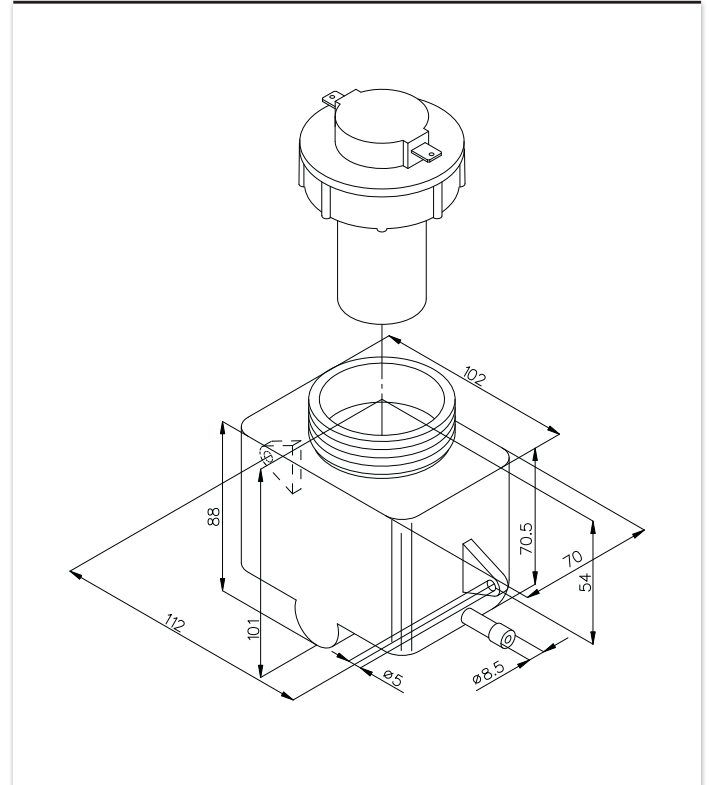
Capacity 250 cc

ACCESSORIES

Cap for electric check Cod. RO15432

Support Cod. 12200

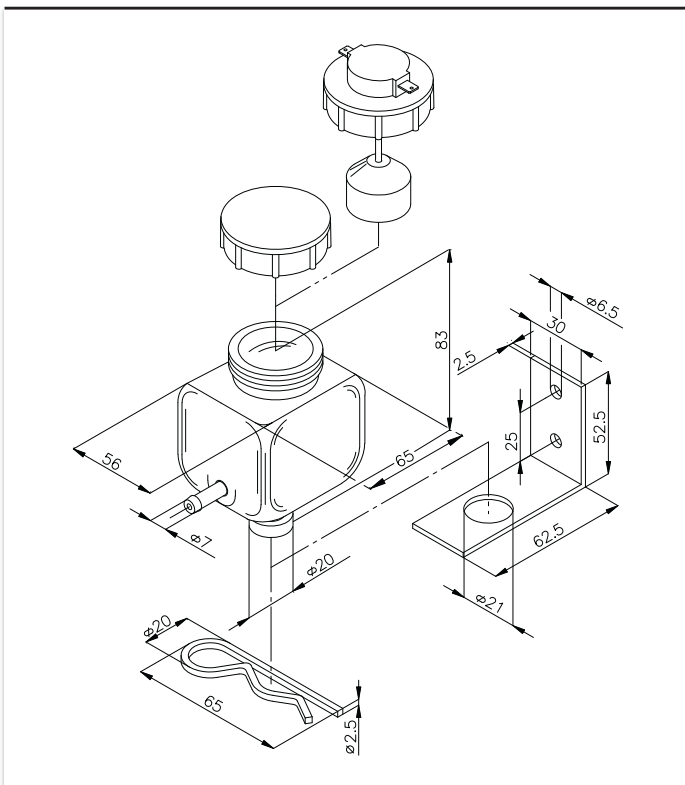
Retaining springs Cod. BL15419



Type of oil	Mineral oil DEXTRON - LHM	022564MN
	Brake fluid DOT 3-4	022564FN

Max capacity 350 cc

Min level 190 cc

**RO15425**

Capacity 160 cc

ACCESSORIES

Cap for electric check Cod. RO15432

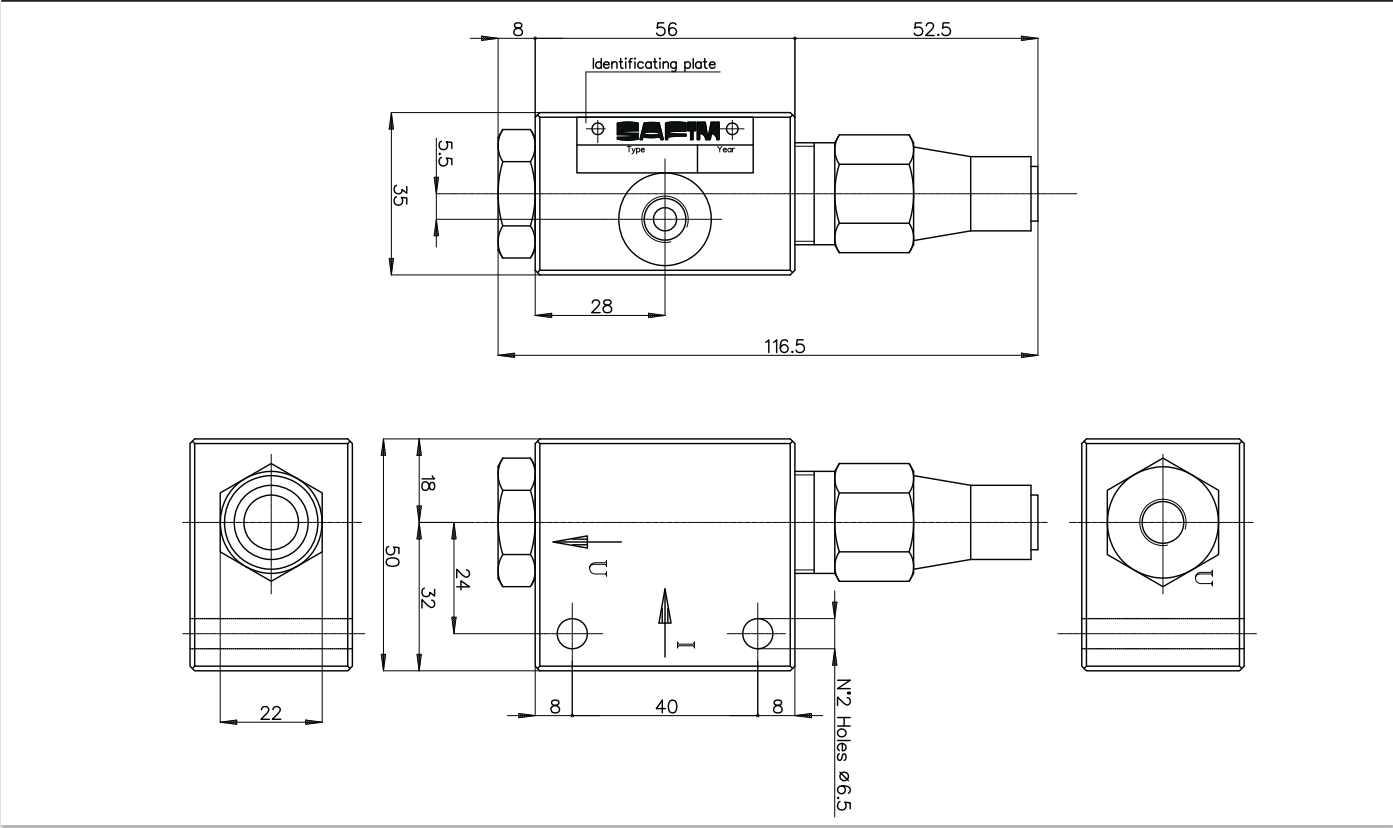
Support Cod. 11807

Retaining springs Cod. BL15419

cod. 202743

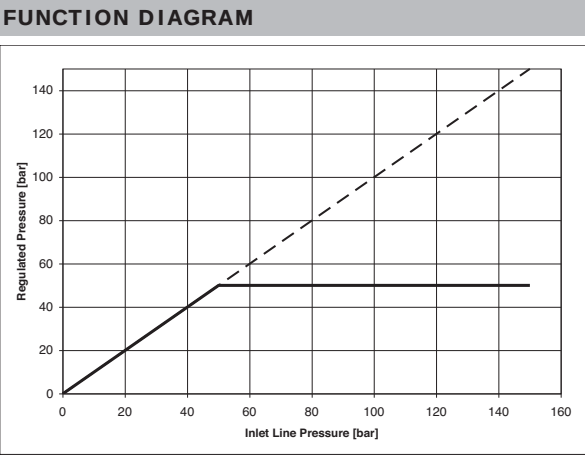
Pressure limiting valve

The brake force limiting valve is suitable for braking systems with brake master cylinders. As it doesn't have an outlet for a possible overpressures, this brake force limiting valve shall be regarged as a dynamic one, because in case of dirt or oil losses the reduced pressure might reach the same level as the oil inlet pressure for very long braking time.



CONNECTIONS		
U	Regulated pressure	M10x1 DIN 3852-1X
I	Inlet lines pressure	M10x1 DIN 3852-1X

TECHNICAL FEATURES	
Max pressure in I	120 bar
ΔP max between I - U	80 bar
Filtration degree : NAS 1638 cat. B	
Temperature range (Mineral oil)	-20 / +90 °C
Temperature range (Brake fluid)	-30 / +100 °C



ORDER PART NUMBER

20

2743

MN

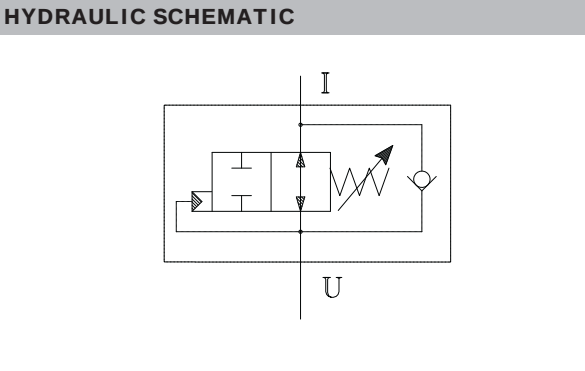
/

50

Product class = 20

	Type of oil	Setting (±2.5 bar)
MN	Mineral oil	From 15 to 100 bar
FN	Brake fluid DOT 3-4	(step of 5 bar)

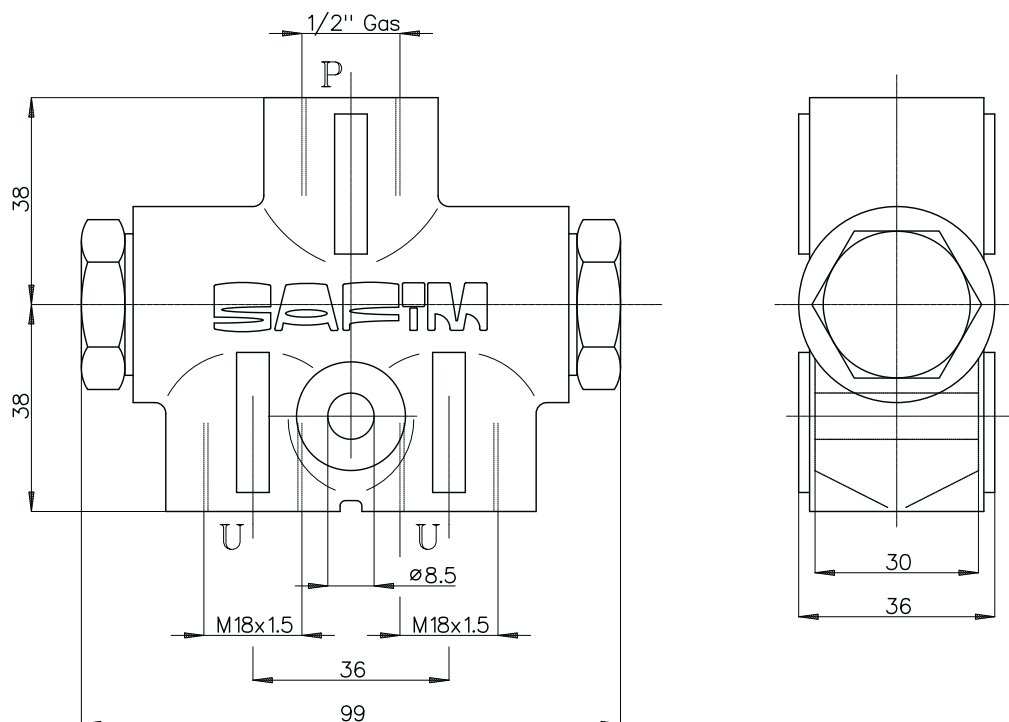
SPARE PARTS	
Valve code	Seal kit
202743MN/	SG13813
202743FN/	SG13814



cod. 201064 Flow Divider

This kind of valve splits input flow into equal parts.

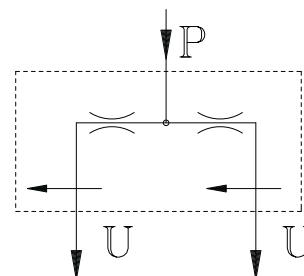
Flow dividers have different sizes according to their application fields, solely depending on input flow ranges

**CONNECTIONS**

P	Input flow	1/2" GAS
U	Flow to services	M18x1.5

TECHNICAL FEATURES

Max input flow	40 l/min
Max working pressure	210 bar
Working temperature	-20°C / +90°C

HYDRAULIC SCHEMATIC**ORDER PART NUMBER**

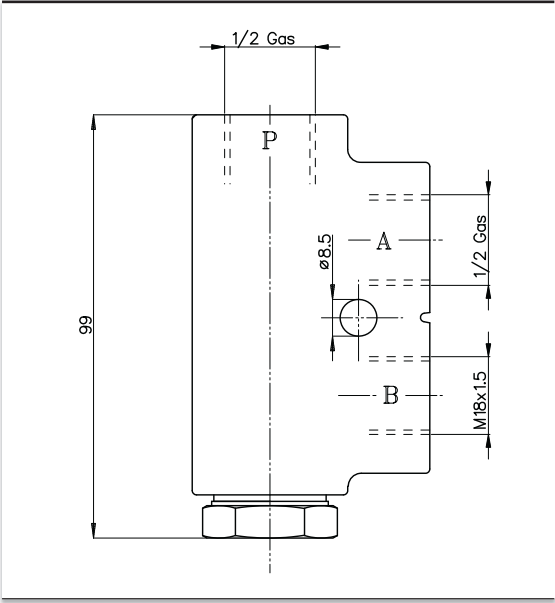
20 1064 /

Input flow (P) l/min	Code
Da 5 a 12	5
Da 8 a 20	8
Da 12 a 30	12
Da 16 a 40	16
Da 20 a 50	20

cod. 201062

cod. 201240

Priority Valve



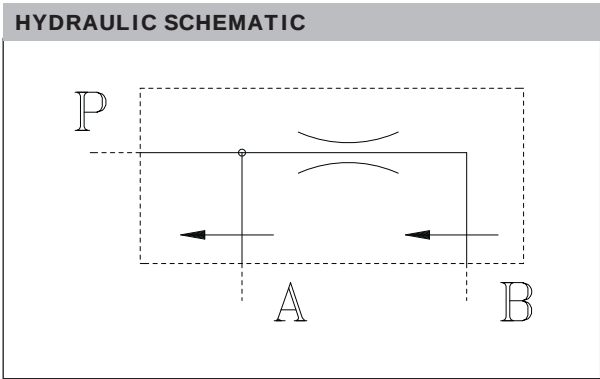
This kind of valve feeds two independent circuits with just a single pump, through a metering unit that keeps priority flow constant and directs residual flow into the secondary circuit.

The priority valve setting is fixed, whilst the nominal priority flow rate may vary according to pressure.

Flow ratings stated were recorded according to some tests' results carried out on a series of valves using mineral based hydraulic oil with 3,5 °E viscosity at temperature of 40 °C.

CONNECTIONS		
P	Input flow	1/2" GAS
A	Residual flow	1/2" GAS
B	Priority flow	M18x1.5

TECHNICAL FEATURES		Code
Max Inlet flow	40 l/min	201062
	60-70 l/min	201240
Max working pressure	210 bar	
Working temperature	-20°C / +90°C	



ORDER PART NUMBER

20

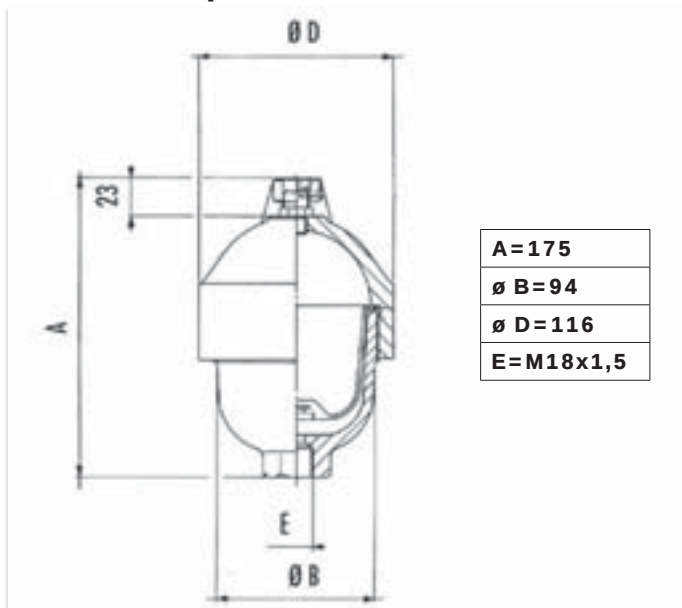
1062

1240

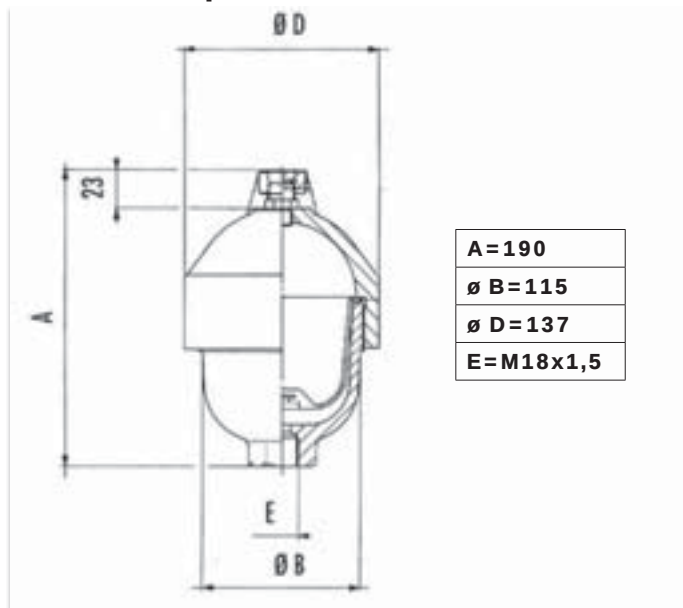
 /

Order Part No.	L / min
20.1062-20.1240 / 21	21
20.1062-20.1240 / 19.5	19.5
20.1062-20.1240 / 16	16
20.1062-20.1240 / 15	15
20.1062-20.1240 / 14	14
20.1062-20.1240 / 13.3	13.3
20.1062-20.1240 / 13	13
20.1062-20.1240 / 12.5	12.5
20.1062-20.1240 / 11	11
20.1062-20.1240 / 10.7	10.7
20.1062-20.1240 / 9.3	9.3
20.1062-20.1240 / 9	9
20.1062-20.1240 / 8.5	8.5
20.1062-20.1240 / 8	8
20.1062-20.1240 / 6.6	6.6
20.1062-20.1240 / 5.5	5.5
20.1062-20.1240 / 3.5	3.5
20.1062-20.1240 / 2.75	2.75
20.1062-20.1240 / 1.75	1.75

Bladded separator accumulator 0.5 L



Bladded separator accumulator 0.75 L



TECHNICAL FEATURES

Nominal volume	0.5 l
Test pressure	315 bar
Max allowable pressure ratio	6/1
Working temperature	-15 °C ~ +80 °C
Assembly	In only position
Diaphragm	ECO
Body	Forged Steel
Weight	3,6 kg

TECHNICAL FEATURES

Nominal volume	0.75 l
Max working pressure	210 bar
Max allowable pressure ratio	6/1
Working temperature	-15 °C ~ +80 °C
Assembly	In only position
Diaphragm	ECO
Body	Forged Steel
Weight	5,5 kg

ORDER PART NUMBER

MO 15557 / XX

Charging pressure setting [bar]:
15 - 20 - 25 - 30 - 40 - 50

MO 15557 Standard charging pressure 60 bar

ORDER PART NUMBER

MO 15558 / XX

Charging pressure setting [bar]:
15 - 20 - 25 - 30 - 40 - 50

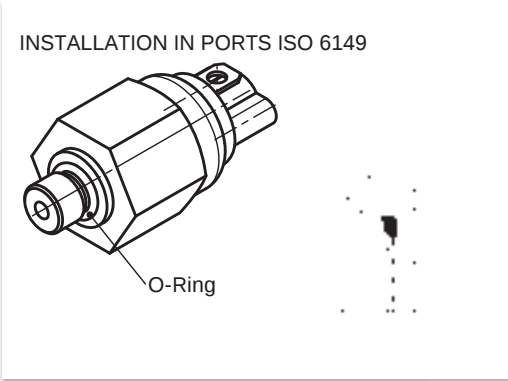
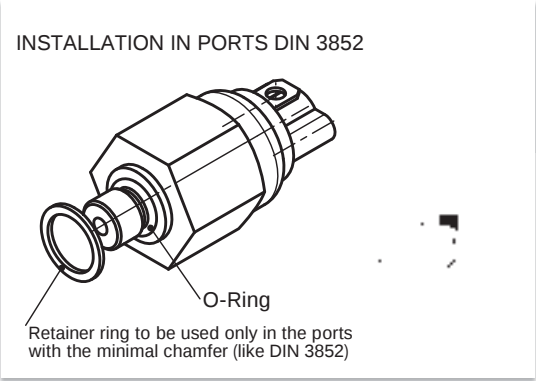
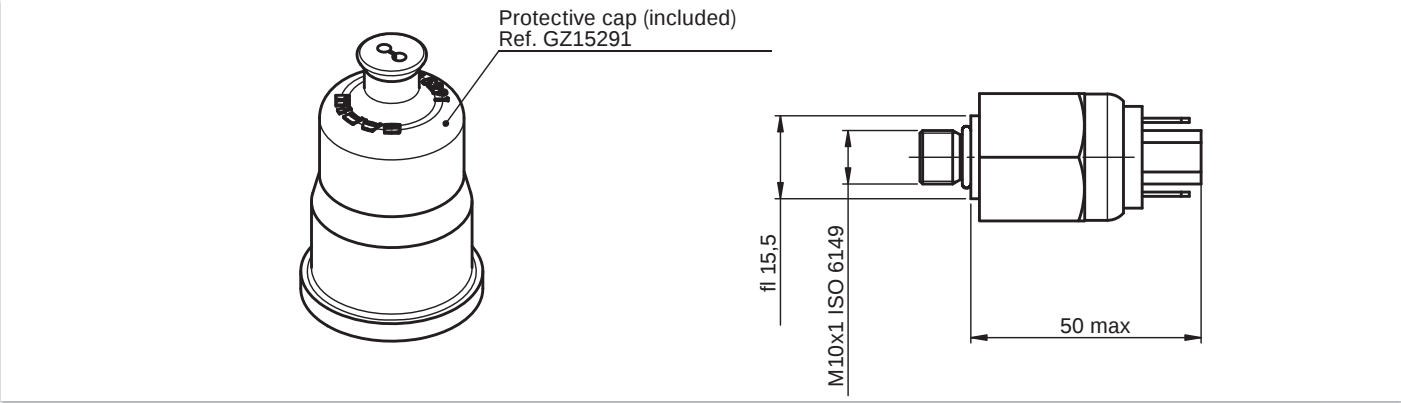
MO 15558 Standard charging pressure 60 bar

Pressure Switches

To adjust the pressure to be checked, use a small screwdriver and turn the adjustment screw (V), being careful not to fully compress the spring.

The position of the electrical contacts NA or NC refers to the stable state, i.e. with no pressure.

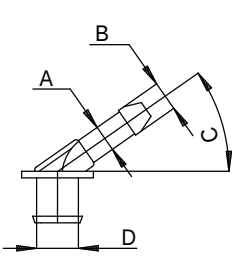
It is recommended to protect the electrical connections and the internal parts against the penetration of dampness, dust, solvents, paints, etc. with the protective cap.

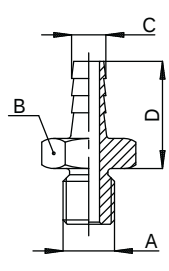


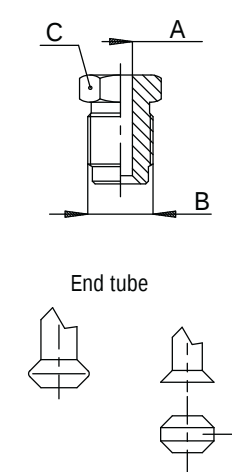
ORDER PART NUMBER				
	Order Part Number (*)	Working range (bar)	Actuation tolerance range at 20°C (bar)	Max static pressure limit
NORMALLY OPEN PRESSURE SWITCHES (NA)	MO17069/1-10	1-10	±0,5	300
	MO17069/10-20	10-20	±1,0	300
	MO17069/20-50	20-50	±2,0	300
	MO17067/30-75	30-75	±3,0	600
	MO17067/70-205	70-205	±7,0	600
NORMALLY CLOSED PRESSURE SWITCHES (NC)	MO17070/1-10	1-10	±0,5	300
	MO17070/10-20	10-20	±1,0	300
	MO17070/20-50	20-50	±2,0	300
	MO17068/30-75	30-75	±3,0	600
	MO17068/70-205	70-205	±7,0	600

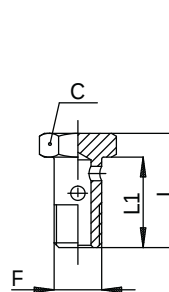
(*) The pressure switch includes protection cap

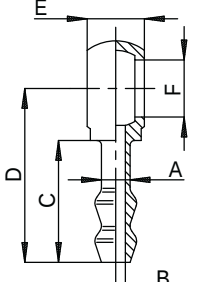
For other informations contact our technical department.

	Measurements				Order part number
	A	B	C	D	
	6	7	0	12.5	RO15374
	8	9	35	12.5	RO15645
	8	8.5	90	12	11269

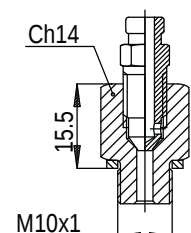
	Measurements				Order part number
	A	B	C	D	
	M12x1.5	19	8	25	RO15215
	M18x1.5	24	8	25	RO15216

	Measurements			Order part number
	A	B	C	
	5.1	M10x1	13	RO15958
	5.1	M10x1.25	13	RO15176
	6.1	M12x1	13	RO15294
	6.1	M12x1.25	13	BL15594
	6.1	M12x1.5	12	RO15175
	6.1	1/4"	13	11637
BICONICAL ADAPTER REF. BL15217 To be used when the tube end has only one countersunk profile				

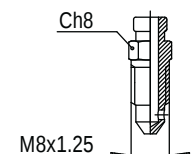
	Measurements				Order part number
	F	L1	L	C	
	M10x1	21	26	14	BL15495
	M10x1	33	38	14	12465
	M10x1.25	21	26	14	RO15293
	M12x1.25	23	29	17	11514
	M12x1.5	23	28	17	BL15737
	M14x1.5	30	38	19	BL15730
	M18x1.5	25.5	32	27	RO15777

	Measurements						Order part number
	A	B	C	D	E	F	
	6	4	16	28	10	10	RO15770
	6	4	16	32	12	12	RO15739
	8	5	18	31	12	12	RO15738
	8	5	23	37	12	18	12458

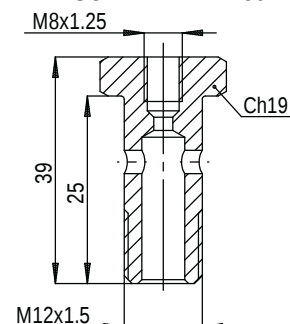
BLEEDER SCREW UNIT REF. 021630

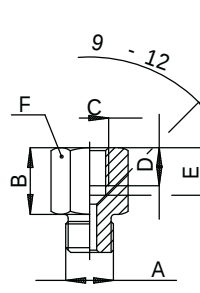


BLEEDER SCREW UNIT REF. RO15154



BORED BOLT WITH HOLE FOR BLEEDER SCREW REF. 12591

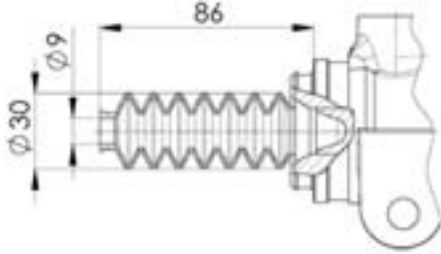
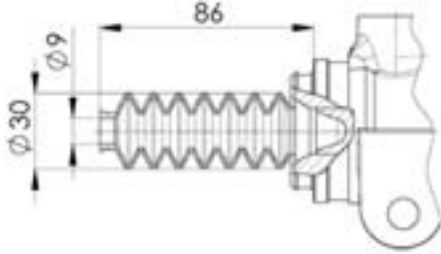
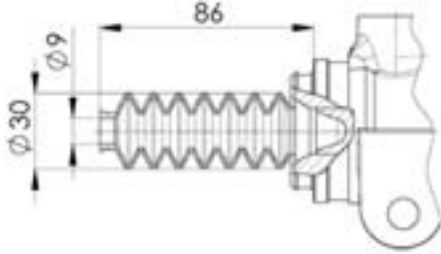
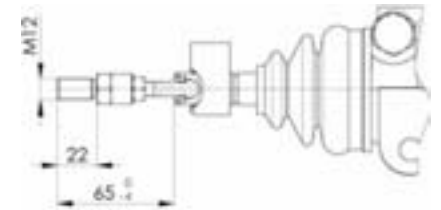
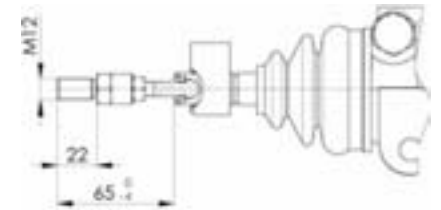
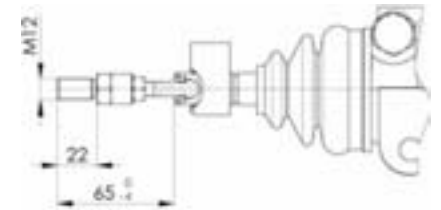
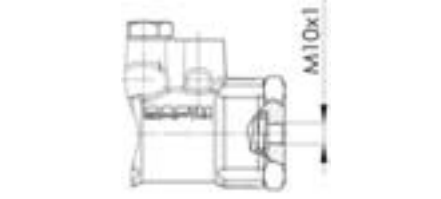
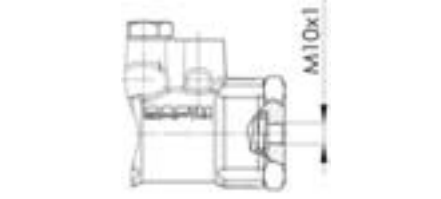
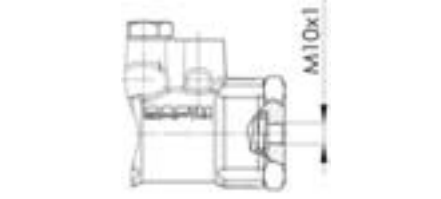
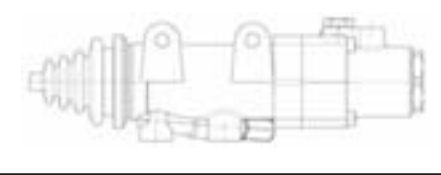
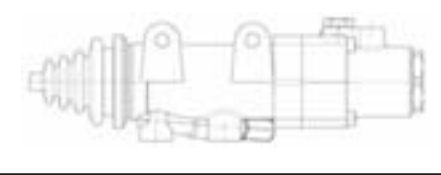
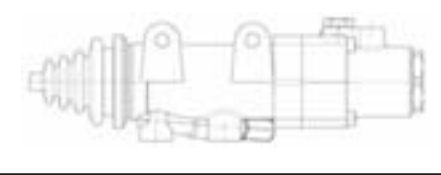


	Measurements						Order part number
	A	B	C	D	E	F	
	M10x1	14	M8x1,25	8	10	14	11993
	M10x1	17	M12x1,5	12	13	19	12832
	M10x1.25	18	M12x1,5	9.5	12.5	17	BL15277
	M12x1.5	16	M10x1,25	7.5	10	19	BL15278
	M14x1.5	17	M10x1	12	14	19	RO16182
	M14x1.5	17	M12x1.5	12	15	19	12592
	M16x1.5	17	M12x1.5	13	15	22	13291
	3/8"	22	1/4"	14	17	22	BL16040

ATTENTION: The figures given in this table are only approximate. We reserve the right to make variations without prior notice.

CODIFICATION TABLE

The codify below is used only for master cylinders with hydraulic booster.
It allows to identify some assembly particularities by the reading of standard order part number.
The identification letter is added after the basic part number of the master cylinder, like the example below.

041059FN	/1	-C			
		<table><tr><td>-C</td><td>SPECIAL RUBBER COVER FOR VERY DIRTY ENVIROMENT. Only for open centre booster d.38/40 and closed centre booster for mineral oil</td><td></td></tr></table>	-C	SPECIAL RUBBER COVER FOR VERY DIRTY ENVIROMENT. Only for open centre booster d.38/40 and closed centre booster for mineral oil	
-C	SPECIAL RUBBER COVER FOR VERY DIRTY ENVIROMENT. Only for open centre booster d.38/40 and closed centre booster for mineral oil				
	/1	<table><tr><td>/1</td><td>SAFETY PUSH-ROD Only for booster with pressure inlet or accumulator port on the rod. (See page 010.120)</td><td></td></tr></table>	/1	SAFETY PUSH-ROD Only for booster with pressure inlet or accumulator port on the rod. (See page 010.120)	
/1	SAFETY PUSH-ROD Only for booster with pressure inlet or accumulator port on the rod. (See page 010.120)				
		<table><tr><td>D</td><td>M10x1 THREAD Pressure switch port (See page 010.030)</td><td></td></tr></table>	D	M10x1 THREAD Pressure switch port (See page 010.030)	
D	M10x1 THREAD Pressure switch port (See page 010.030)				
		<table><tr><td>O</td><td>BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (See page 010.030)</td><td></td></tr></table>	O	BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (See page 010.030)	
O	BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (See page 010.030)				
		<table><tr><td>P</td><td>M10x1 THREAD + BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (D + O</td><td></td></tr></table>	P	M10x1 THREAD + BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (D + O	
P	M10x1 THREAD + BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (D + O				
		<table><tr><td>R</td><td>SAFETY PUSH-ROD + BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (/1 + O)</td><td></td></tr></table>	R	SAFETY PUSH-ROD + BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (/1 + O)	
R	SAFETY PUSH-ROD + BOOSTER BODY ROTATED OF 180° RESPECT TO MASTER CYL. BODY (/1 + O)				

REASSUMING TABLE OF MASTER CYLINDERS WITH HYDRAULIC BOOSTER

Master cylinders with hydraulic booster, single circuit					
	KIND OF BOOSTER				
Total displacement	OLD REFERENCE	OPEN CENTER	OPEN CENTER WITH ACCUMULATOR	CLOSED CENTER	CLOSED CENTER FOR MINERAL OIL
19 / 44	12355	020.010	040.010	060.010	080.010-020
27.5 / 49	12356	020.020	040.020	060.020	080.030-040
19	13350	020.030	040.030	060.030	080.050-060
30.9	-				080.080-100
37.5	-				080.110-120
44.2	-				080.130-140
47	13351	020.040	040.040	060.040	
55.5	13352	020.050	040.050	060.050	
67	65 cc	020.060	040.060		

Master cylinders with hydraulic booster, double circuit					
	KIND OF BOOSTER				
Total displacement	OLD REFERENCE	OPEN CENTER	OPEN CENTER WITH ACCUMULATOR	CLOSED CENTER	CLOSED CENTER FOR MINERAL OIL
18.5 / 43.5	12350	030.010	050.010	070.010	090.010-020
26.5 / 48	12351	030.020	050.020	070.020	090.030-040
18.5	13355	030.030	050.030	070.030.	090.050-060
28.6	-				090.070-080
36.6	-				090.090-100
46	13356	030.040	050.040	070.050	
54	13357	030.050	050.050	070.040	
65	65 cc	030.060	050.060		

PART NUMBER INDEX

Basic P / N	Page
051022	030.020
051026	020.010
051028	030.010
051030	020.020
041031	030.040
041032	020.040
041037	030.030
041038	020.030
041044	030.050
041059	020.050
041145	030.060
051285	070.010
051328	060.010
041329	060.030
041345	070.030
051403	060.020
051410	070.020
041436	060.040
041437	060.050
041532	100.010
041772	090.050
041773	090.060
041781	070.040
041786	040.050
041787	050.040
041790	050.030
041791	040.040
041794	040.030
041795	050.050

Basic P / N	Page
041796	050.060
041985	080.060
041991	080.050
042173	040.060
042178	020.060
042405	080.080
042569	080.090
042570	080.100
042571	080.110
042572	080.120
042573	080.130
042574	080.140
042744	100.020
043000	090.070
043002	090.080
043004	090.090
043006	090.100
051612	080.030
051613	090.030
051614	080.040
051615	090.040
051788	050.020
051789	050.010
051792	040.020
051793	040.010
051971	090.010
051979	080.020
052072	090.020
052076	080.010

PRODUCTS



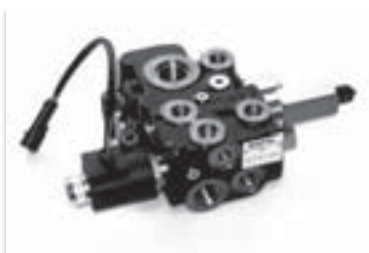
Master cylinders

Master cylinders Master cylinders with or without hydraulic booster, single or double circuit, single or step-bore piston



SAFIM S6 brake valves

SAFIM S6 brake valves Completely powered brake valves



Master priority valve

Master priority valve Valve controlling steering and accumulators charge.



Wheel cylinders

Brake wheel cylinders Multi-function, negative and positive brake cylinders.



Farm tractors hydraulic braking

Hydraulic trailer brake braking system Trailer brake valves for European and Italian market, quick-release couplings, service and parking brake cylinders.



Accessories

Accessories to complete the hydraulic brakes system.



SAFIM was awarded the following quality certificates: ISO 9001 in the year 1999, VISION 2000 in the year 2002.

The quality system is completely supported by paperwork and it has 3 procedure levels:

- a) "Quality manual" explaining SAFIM internal management and company policy.
- b) "Operating procedures" regulating the main company processes and appointing tasks to our staff.
- c) "Technical procedures" giving the necessary instructions to carry out the different jobs appointed to our staff.

All the procedures results related to our products are being recorded and listed so that any quality indicator can be accessed at any time.



SAFIM SAFIM was awarded the quality certificate ISO 14001:2004 in the year 2006.

Since 2006 we attended the environmental certification ISO 14001:2004



SAFIM S.p.A.

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