

TSplus WT2S



Workpiece Pallet

Assembly and Maintenance Guide

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Workpiece Pallet

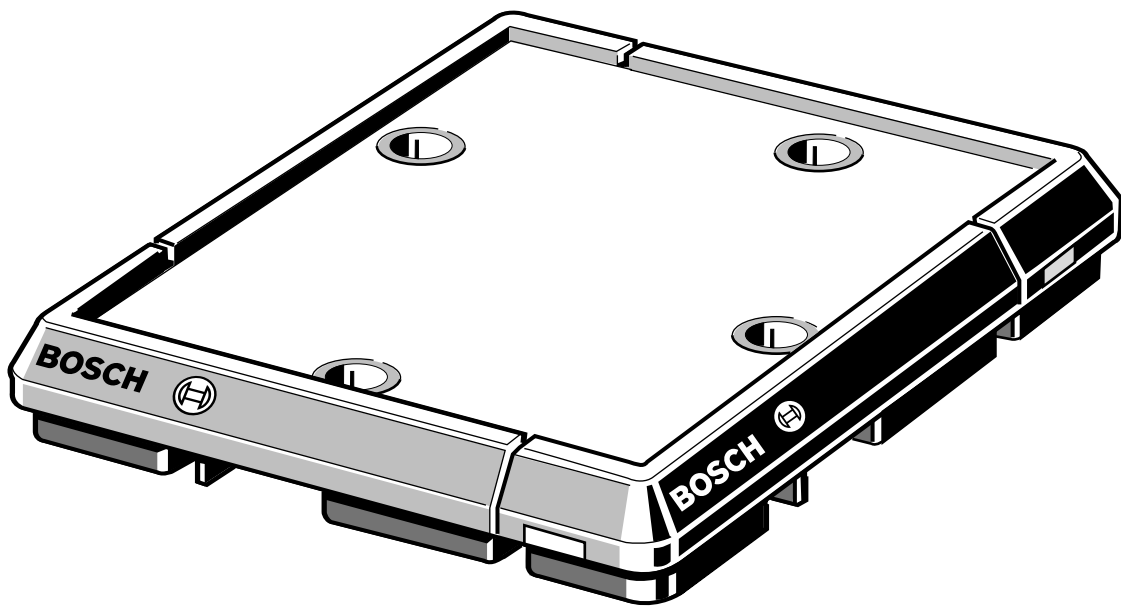



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IMPORTANT SAFETY INFORMATION

Warning!

Please read all assembly and maintenance instructions carefully before beginning set-up of the components in this document.

Where appropriate, warning symbols  have been included in this publication to alert you of potential or impending danger.

- Be sure to read and observe all safety warnings in this document as well as those attached to the individual modules. Failure to do so could result in potential risks to your health and safety as well as those around you.
- Covers and guards have been designed to eliminate pinch points and exposure to moving chains and gears. **DO NOT** operate the conveyor or any of the other components in the system with the guards removed. Serious injury may result!
- All set-up maintenance and repair work should be performed only by properly trained, qualified personnel. All operators must be properly trained in the use of this equipment.
- A qualified electrician must make all electrical connections when wiring the components installed in the *TSplus* system. Be sure to follow all local, state and federal regulations when installing electrical devices of any type. The customer assumes responsibility for the control system, and must provide an EMERGENCY-OFF SWITCH for the installed *TSplus* conveyor system.
- All power supplies must be LOCKED OUT before beginning maintenance or repair work of any type on the conveyor system. Proper LOCK OUT procedures include the identification of the locked out power supply with a tag to prevent the accidental restoration of power.
- *TSplus* pneumatic components are designed to operate in a range of 4–6 Bar (58–87psi). It is the user's responsibility to install a filtered, regulated air supply to limit the pressure to that recommended by the manufacturer. Before beginning any maintenance or repair, bleed off the pressure lines to all components to prevent unexpected or accidental movement of a system component which could result in personal injury.
- *TSplus* drives, returns and conveyor sections are designed to transport Bosch WT2S workpiece pallets. Proper usage is defined as the transport of parts and assemblies via the workpiece pallet and fixture during the assembly process. In no instances should the pallet payload, the downward force applied to the pallet, or the total load carrying capacity of the entire system be exceeded. Exceeding published specifications will result in premature wear or system failure and may cause damage to the motor, gearbox, roller chain, seals and other components.

SAVE THESE INSTRUCTIONS!

Liability:

In no event can the manufacturer accept warranty claims or liability claims for damages resulting from improper use of the equipment or as a result of changes made to the equipment other than those specified in this instruction manual.

Guarantee:

The manufacturer will accept no claims in which non-original spare parts have been used. For information on spare parts and replacement parts refer to publication no. 8981 500 XXX *TSplus* Spare Parts List.

Environmental Protection:

Always dispose of worn, damaged or obsolete parts in a responsible manner. Some components, such as gearboxes, contain lubricating oil which can pollute the environment. It is the user's responsibility to dispose of all hazardous material within the components following all local, state and federal guidelines. Please contact Bosch for copies of the Material Safety Data Sheets (MSDS) for the lubricating oil used in gearboxes.

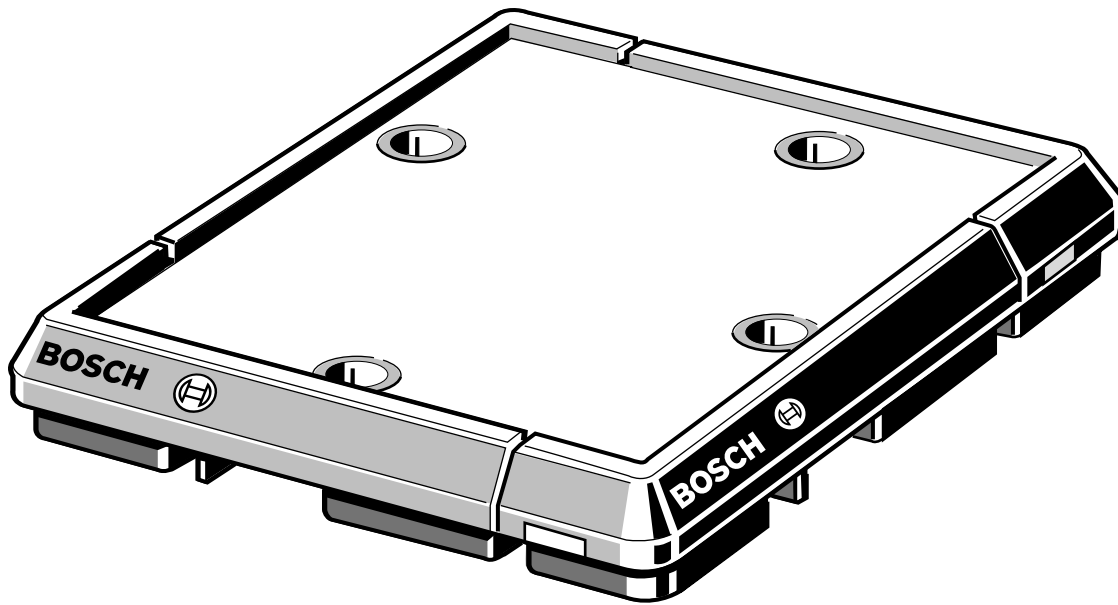


Fig. 1

Introduction

Like all Bosch flexible assembly systems, *TSplus* is constructed solely from standardized modules that are precisely matched to each other. One important benefit of this modular design is that you can interlink manual and automatic work stations freely, making *TSplus* suitable for virtually any assembly task.

The WT2S Workpiece Pallet is the component around which the entire *TSplus* conveyor is designed. Pallet queuing allows for non-synchronous pallet transport, giving you maximum flexibility in designing and setting up your line layout.

Shipping Information

The WT2S pallet is delivered either fully assembled or as a kit of individual components, depending on your order and needs.

A completely assembled pallet is shown in Fig. 1.

Design and Detailed Description

The WT2S Workpiece Pallet consists of the following main components (Fig. 2 and 3):

- 1 Support Plate
- 2 Corner Frame Module
- 3 Frame Extension
- 4 Positioning Bushing
- 5 Spring Pin
- 6 Reinforcing Bolt (for pallets 400mm x 480mm and larger)

The electrically conductive polyamide corner frame modules (2) and frame extensions (3) make up the outer pallet framework. Built in exciter plates provide a means for pallet present sensing when used in conjunction with inductive proximity sensors.

Fully assembled workpiece pallets are available in 21 standard sizes ranging from 160mm x 160mm to 1040mm x 1040mm. Pallets 400mm x 480mm and larger use frame extensions (3), spring pins (5) and reinforcing bolts (6).

The support plate (1) acts as the mounting surface for fixtures or identification and data-storage devices. Plates are available in 4.8mm steel, 6.35mm aluminum and 12.7mm aluminum. Hardened steel positioning bushings (4) join the frame modules to the support plate and allow precise pallet positioning at workstations.

Caution: Do not grind or sand the surface coating on the pallet support plate! Particulate from the surface coating is hazardous if inhaled or inadvertently ingested. Contact Bosch Automation Products for a Material Safety Data Sheet on the pallet support plate surface coating.

Workpiece Pallet 400mm x 400mm and Smaller

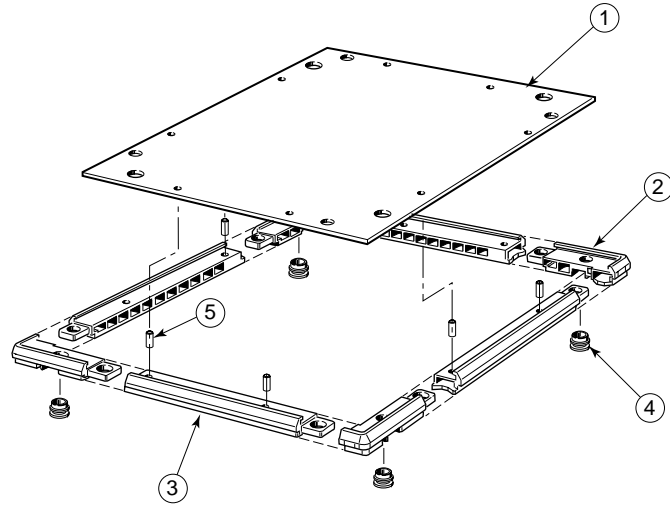


Fig. 2

Workpiece Pallets 400mm x 480mm and Larger

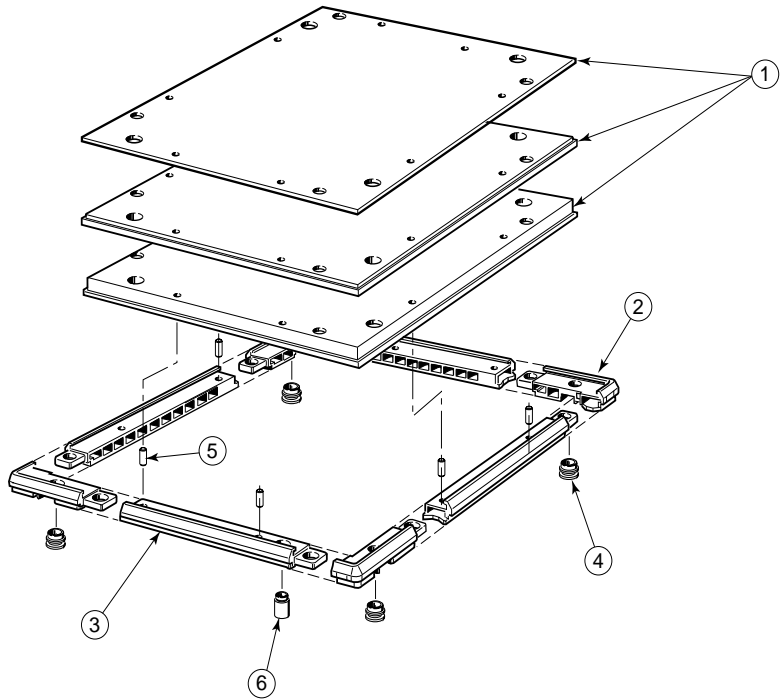


Fig. 3

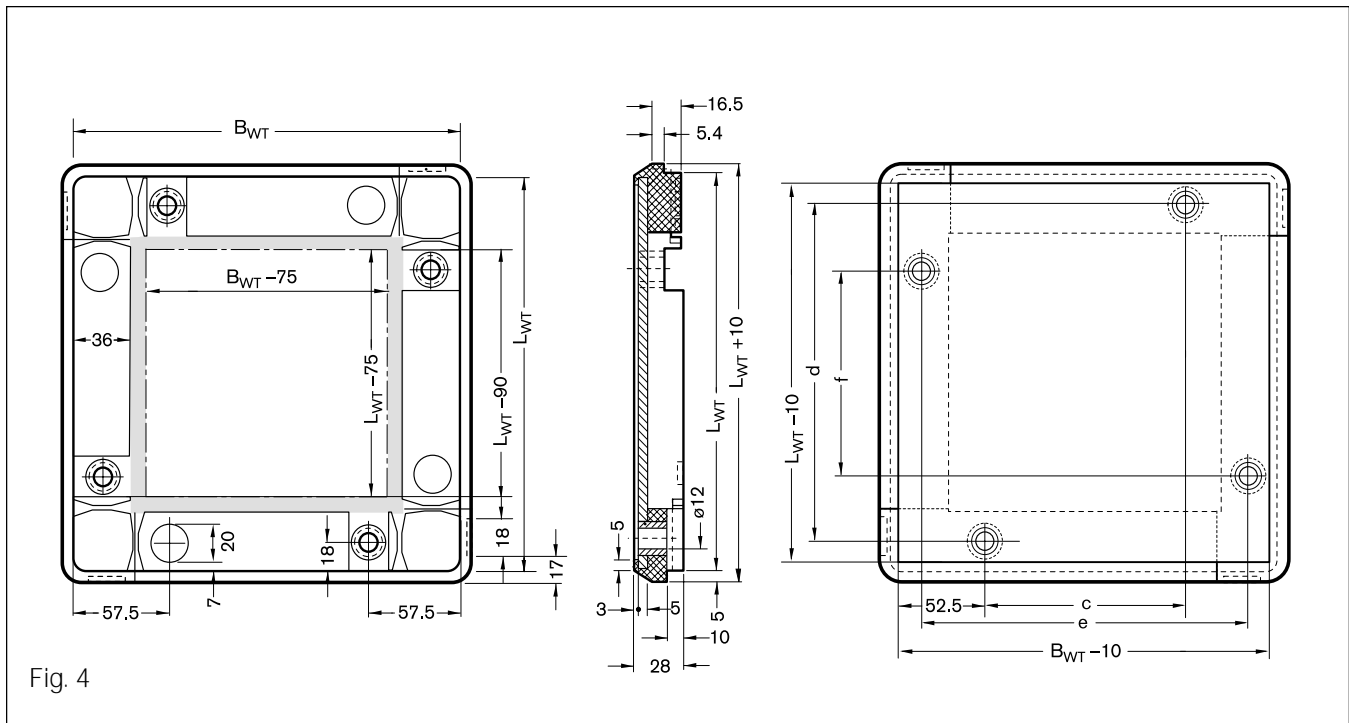


Fig. 4

Functional Dimensions

The functional dimensions of the WT2S workpiece pallet are shown in Fig. 4 and Table 1. Standard pallet sizes and their weight in kilograms are shown in Table 2.

When machining your own pallet plates, please contact the Applications Engineering Department at Bosch Automation Products for complete technical dimensions.

Table 1: Workpiece Pallet Dimensions (in mm)

Pallet Size		Dimensions			
B _{WT} (mm)	L _{WT} (mm)	c (mm)	d (mm)	e (mm)	f (mm)
160	160	45	124	124	45
160	240	45	204	124	125
160	320	45	284	124	205
160	400	45	364	124	285
160	480	45	444	124	365
240	240	125	204	204	125
240	320	125	284	204	205
240	400	125	364	204	285
240	480	125	444	204	365
320	320	205	284	284	205
320	400	205	364	284	285
320	480	205	444	284	365
320	640	205	604	284	525

Pallet Size		Dimensions			
B _{WT} (mm)	L _{WT} (mm)	c (mm)	d (mm)	e (mm)	f (mm)
400	400	285	364	364	285
400	480	285	444	364	365
400	640	285	604	364	525
400	800	285	764	364	685
480	480	365	444	444	365
480	640	365	604	444	525
480	800	365	764	444	685
640	640	525	604	604	525
640	800	525	764	604	685
640	1040	525	1004	604	925
800	800	685	764	764	685
800	1040	685	1004	764	925
1040	1040	925	1004	1004	925

Table 1: Workpiece Pallet Load Capacity (in kg)

Pallet Size		Component Weight (Kg)				B _{WT}	L _{WT}
B _{WT} (mm)	L _{WT} (mm)	Frame (Kg)	4.8ST Plate (Kg)	6.35AL Plate (Kg)	12.7AL Plate (Kg)	Max Load* (Kg)	Max Load* (Kg)
160	160	0.32	0.9	0.4	0.8	16	16
160	240	0.39	1.3	0.6	1.3	16	24
160	320	0.45	1.8	0.8	1.7	16	32
160	400	0.52	2.3	1.1	2.1	16	40
160	480	0.64	2.7	1.3	2.5	16	48
240	240	0.45	2.0	0.9	1.9	24	24
240	320	0.51	2.7	1.3	2.5	24	32
240	400	0.59	3.4	1.6	3.2	24	40
240	480	0.70	4.1	1.9	3.8	24	48
320	320	0.58	3.7	1.7	3.4	32	32
320	400	0.65	4.6	2.1	4.3	32	40
320	480	0.76	5.5	2.6	5.1	32	48
320	640	0.89	7.4	3.4	6.9	32	64
400	400	0.72	5.8	2.7	5.4	40	40
400	480	0.83	6.9	3.2	6.5	40	48
400	640	0.96	9.3	4.3	8.6	40	64
400	800	1.14	11.6	5.4	10.8	40	70
480	480	0.95	8.3	3.9	7.8	48	48
480	640	1.07	11.1	5.2	10.4	48	64
480	800	1.25	13.9	6.5	13.0	48	70
640	640	1.20	14.9	6.9	13.9	64	64
640	800	1.38	18.6	8.7	17.4	64	70
640	1040	1.57	24.3	11.3	22.6	64	70
800	800	1.55	23.3	10.9	21.7	70	70
800	1040	1.75	30.4	14.2	28.3	70	70
1040	1040	1.94	39.5	18.4	36.9	70	70

* Including, pallet, fixture, and part

Assembly

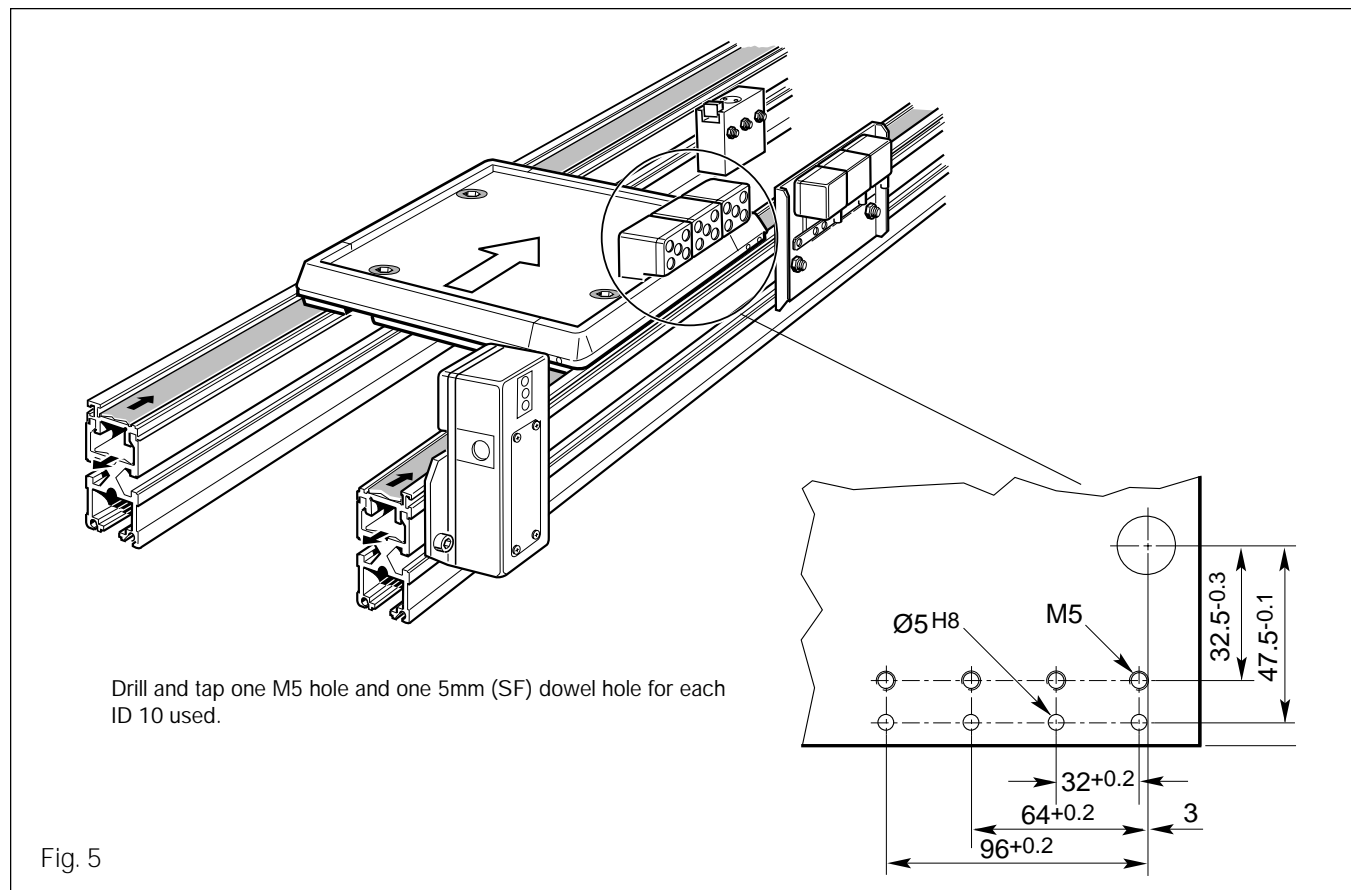
Mounting Hole Locations

Drill all holes required for fixturing, as well as data storage systems prior to assembly. Fig. 5 and Fig. 6 show the required hole patterns for ID 10 and ID 80 respectively.

If you are manufacturing your own support plates:

Make sure to chamfer the edges and corners as shown in Fig. 7. Improperly manufactured support plates may damage the plastic frame modules.

Caution: Do not grind or sand the surface coating on the pallet support plate! Do not inhale particulate while drilling! Particulate from the surface coating is hazardous if inhaled or inadvertently ingested. Contact Bosch Automation Products for a Material Safety Data Sheet on the pallet support plate surface coating.



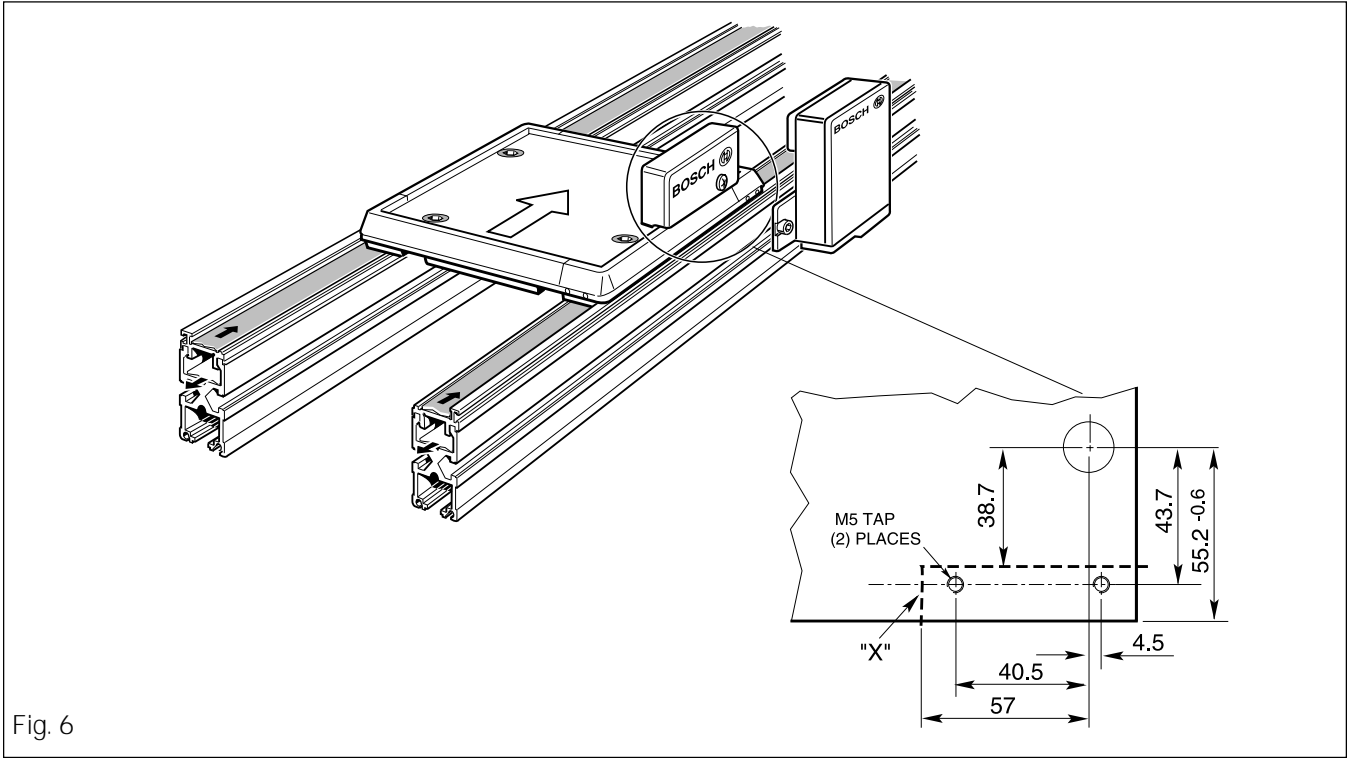


Fig. 6

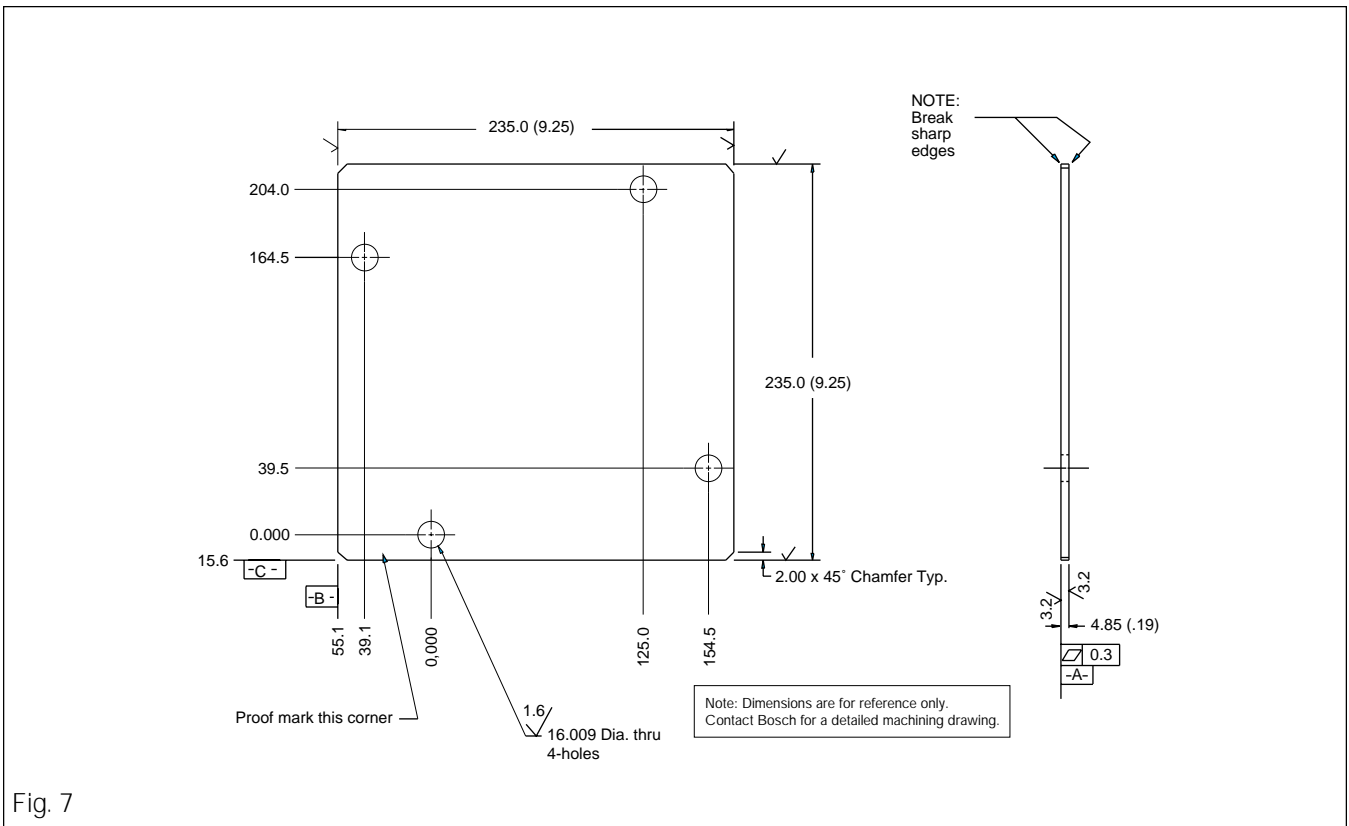


Fig. 7

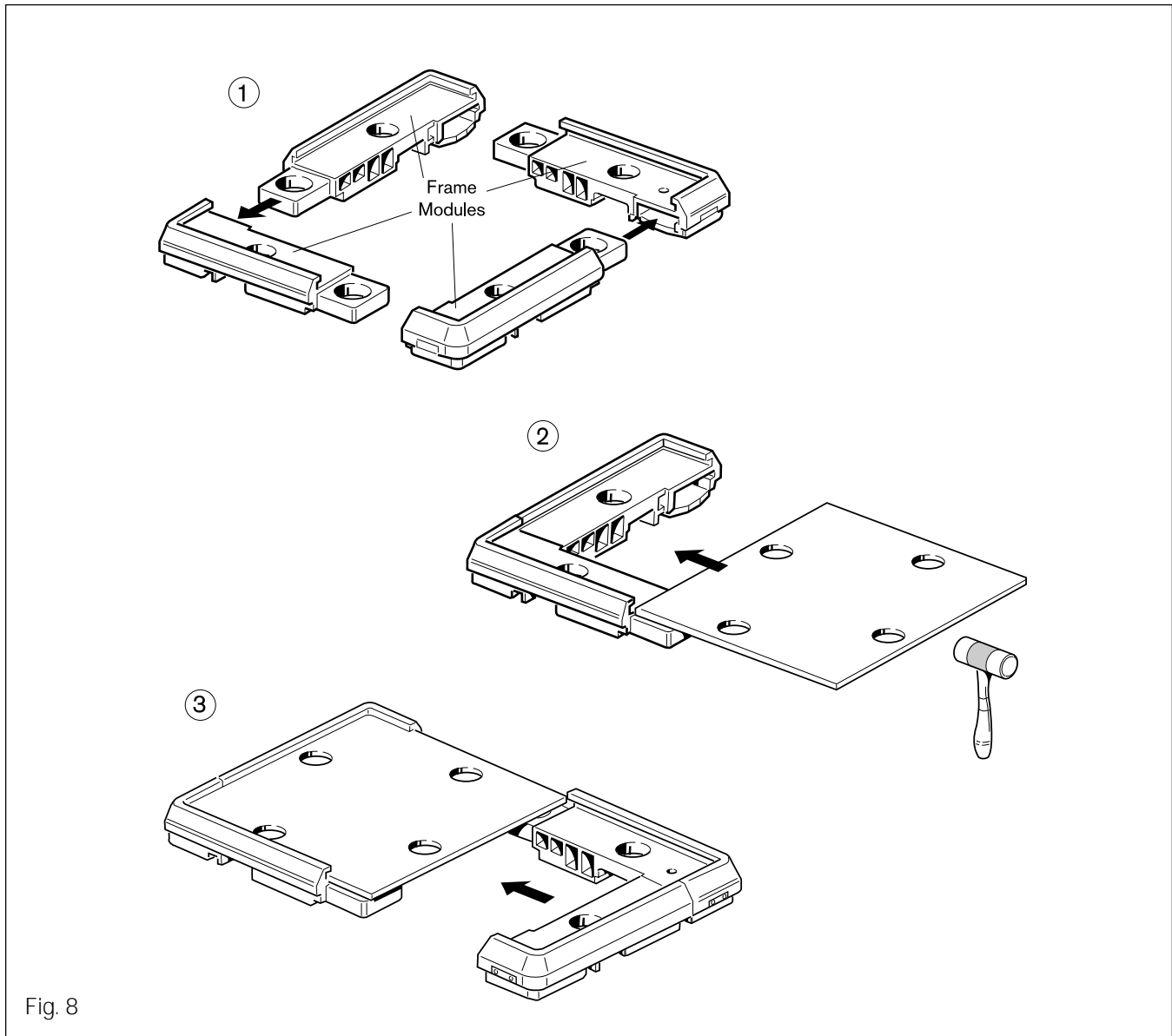
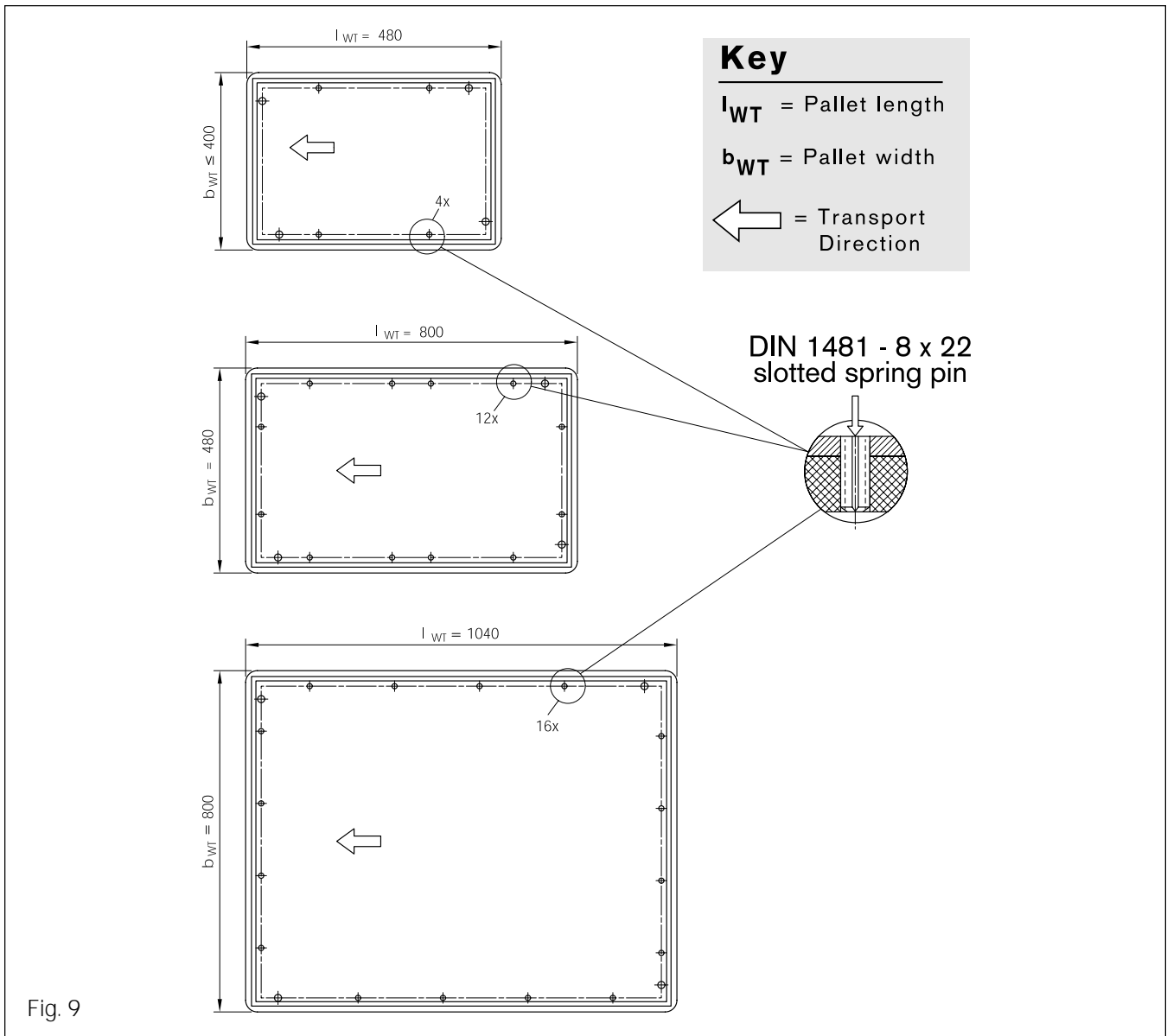


Fig. 8

Step-by-Step Pallet Assembly (Figs. 5 - 9)

Warning! Be careful not to damage the plastic frame module during assembly. If you have machined your own support plates, make sure that you have beveled the edges so that sharp corners do not damage the plastic frame module (see Fig. 7, page 11). Such damage may prevent proper assembly and impair pallet functioning.

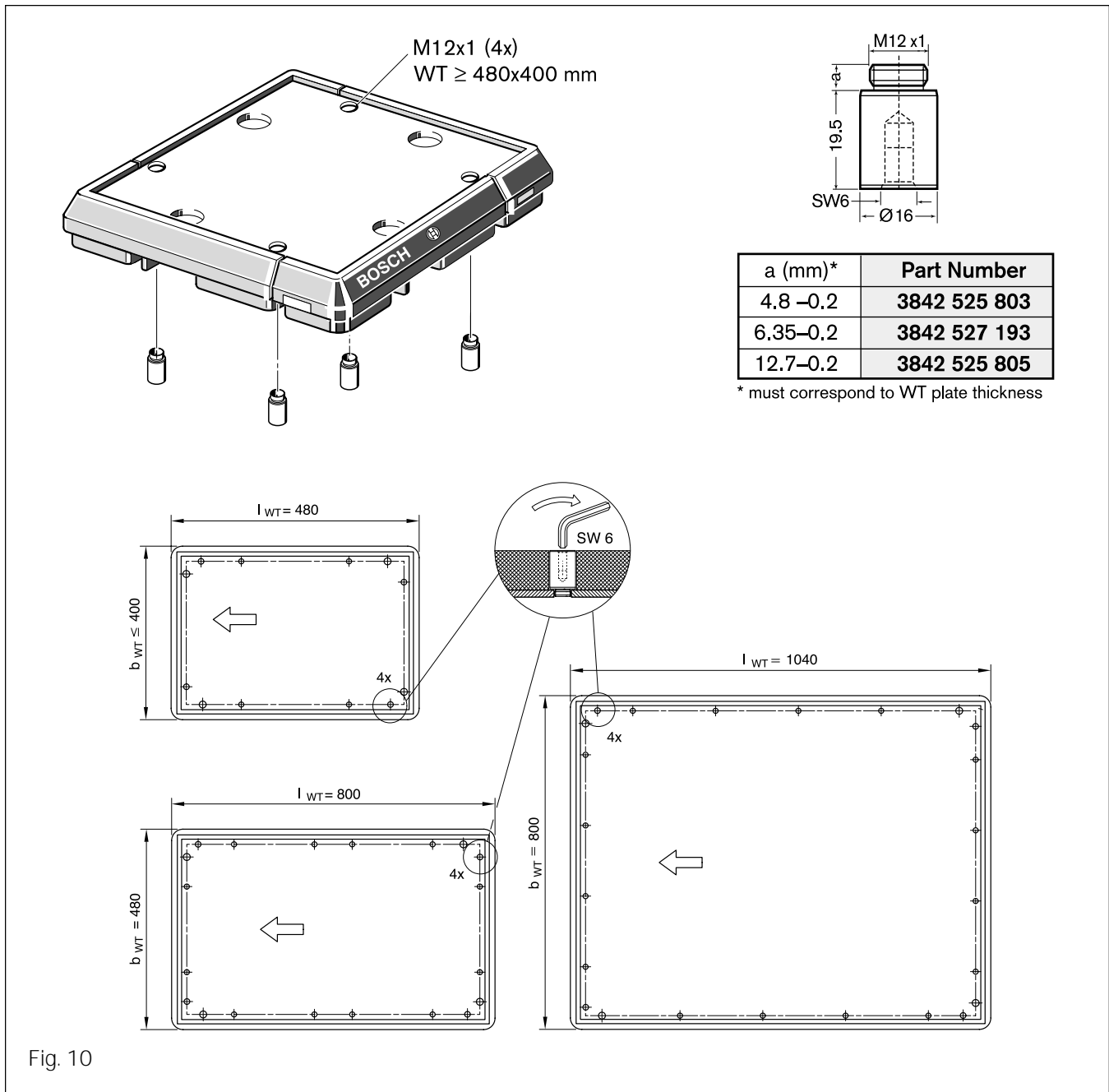
- 1 Arrange the frame modules as shown, and press the two opposite sides of the frame together to form two halves (Fig. 8). Attach frame module extensions in the same manner, as necessary.
- 2 Slide the pallet support plate into the grooves in one half of the frame module. A soft-faced hammer may be used to tap the support plate gently into place.
- 3 Attach the remaining half of the pallet frame module, as illustrated.



Insert spring pins (if required) (Fig. 9).

Larger workpiece pallets (width $b_{WT} = 480$ mm or larger and length $l_{WT} = 480$ mm or larger) also require slotted spring pins (DIN 1481-8x22). The necessary holes are already present in the pallet support plate and frame. Refer to Fig. 9 for the

quantity and arrangement of the pins, and tap them carefully into the proper hole using a hammer.



Insert Reinforcing Bolts (if required) (Fig. 10)

Reinforcing bolts are required for all pallets larger than 400mm x 480mm. Four M12 tapped holes are provided in the pallet plate, along with clearance holes in the pallet frame extensions.

To install the reinforcing bolts, turn the pallet upside down. Remove any grease from the threads on the bolt or in the pallet plate. Use a thread locking compound (Loctite 242 or equiv.) to secure the bolts, when tightening.

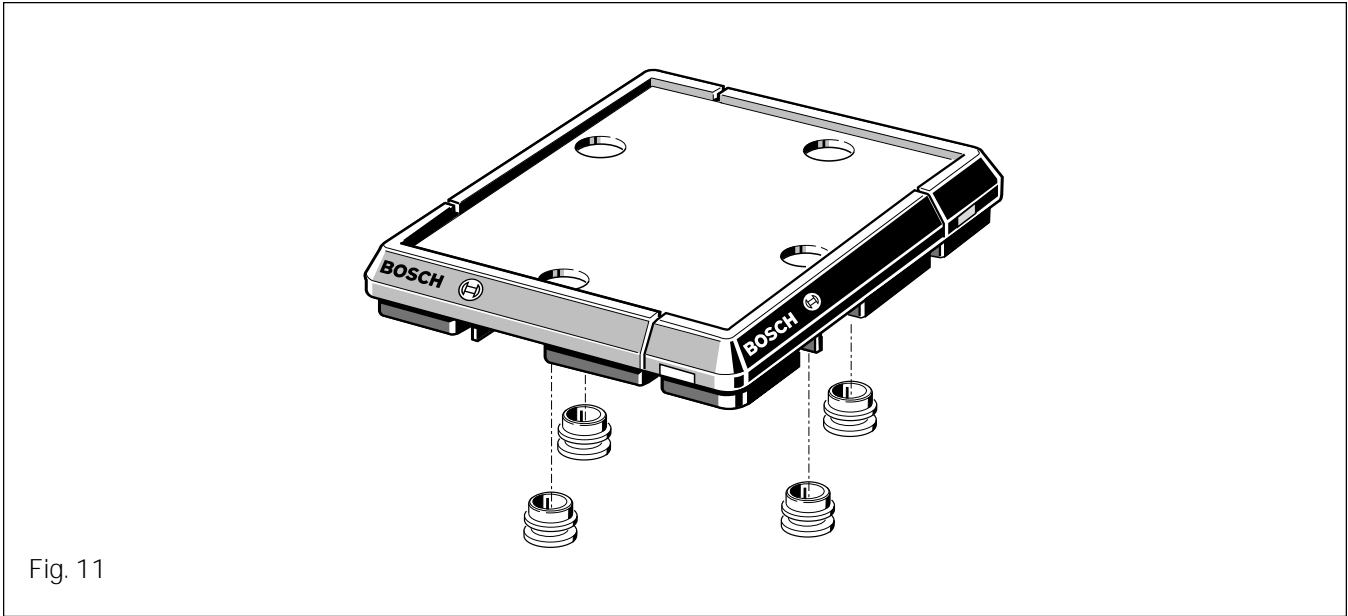


Fig. 11

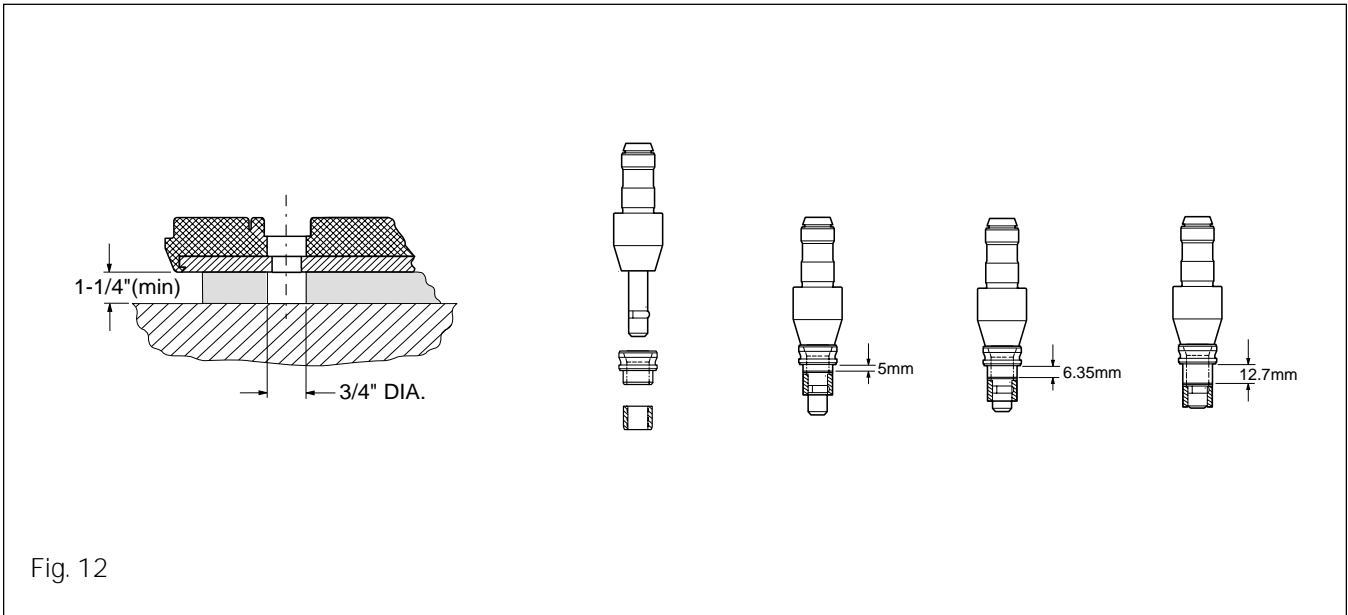
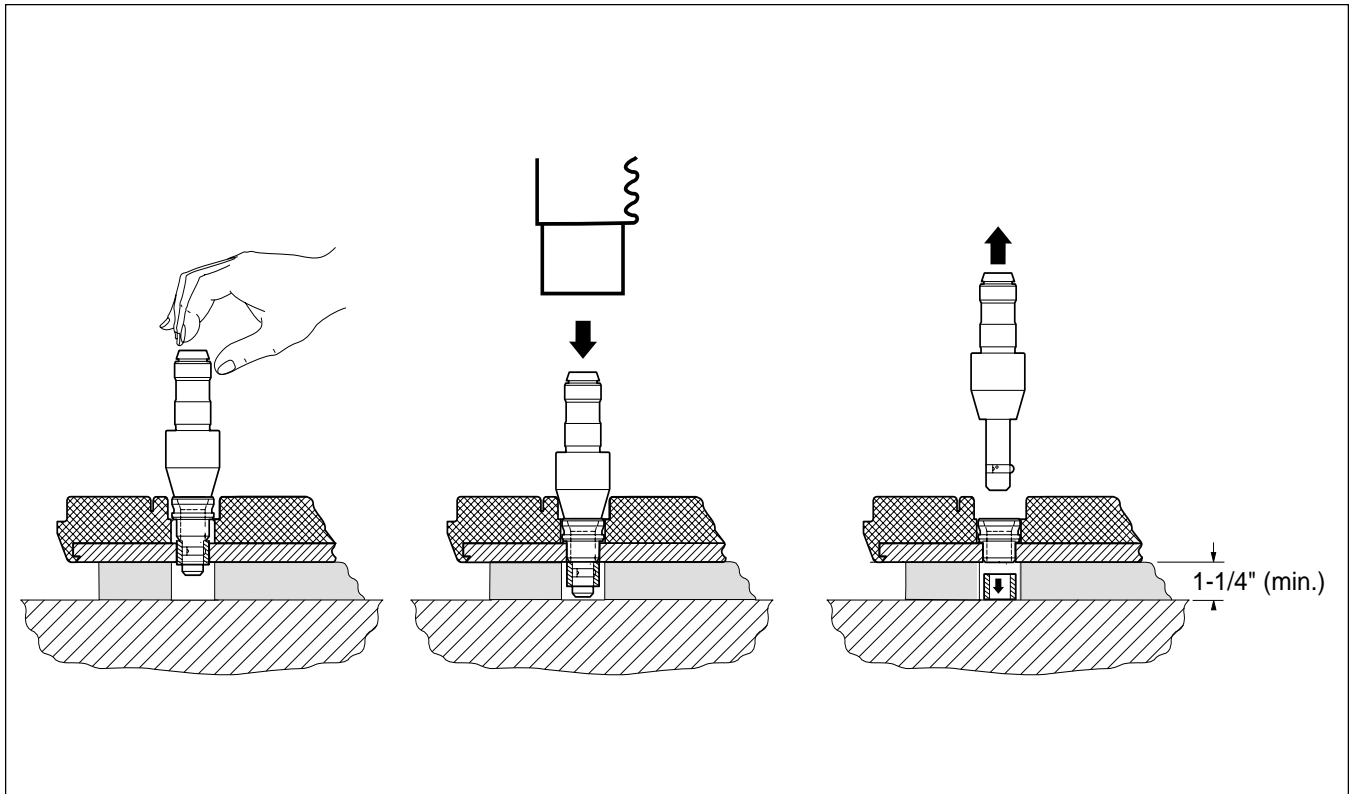


Fig. 12

Positioning bushings (Figs. 11 & 12)

- 1 Turn the pallet upside down on a steel backup plate as shown in Fig. 12. The backup plate needs to be 1-1/4" thick (min.) and have a clearance hole approximately 3/4" diameter.
- 2 Place the positioning bushing and centering sleeve on the assembly madrel (#3842525846) as shown. The madrel is designed to accept positioning bushings for all three standard plate thicknesses.



- 3 Manually insert the assembly mandrel into the hole into the pallet frame and plate. The locating sleeve should fit exactly in the bore in the pallet plate.
- 4 Using an arbor press, press the assembly mandrel until the positioning bushing is fully seated on the pallet plate. The centering sleeve will drop out into the clearance hole in the backup plate.
- 5 Repeat steps 2 - 4 for all bushings.



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