



LAUNCH TOWER & SPACE SHUTTLE WITH BOOSTER ROCKETS

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Auf dem Gelände des John F. Kennedy Space Center (KSC) der US Luft- und Raumfahrtbehörde NASA am nördlichen Ende von Cape Canaveral auf Merritt Island in Florida befindet sich der Launch Komplex 39 mit zwei identischen Startanlagen, LC-39A und 2,6 km entfernt LC-39B. Seit Ende 1968 wurden von hier fast alle bemannten Raumflug-Missionen der NASA mit Saturn-Raketen gestartet. Nach dem Apollo-Programm erfolgte der Umbau der Anlagen für das von 1981 bis 2011 betriebene Shuttle-Programm.

Jede Plattform besteht aus armiertem Beton, liegt rund 15 m über dem Meeresspiegel und ist 119 m lang und 100 m breit. Auf beiden Launch Pads wurden von 1976 bis 1985 die 81,3 m hohen Starttürme (Fixed Service Structure - FSS) mit 12 Etagen und allen notwendigen Versorgungsleitungen, Treppen sowie Fahrstuhl errichtet und ein daran horizontal schwenkbarer Arm, die Rotating Service Structure (RSS) mit dem Payload Changeout Room angebracht. Die RSS wurde zum Shuttle eingedreht, sobald die mobile Startplattform (MLP) mit in Startposition fixiertem Außentank, den beiden Boostern und dem Orbiter auf den sechs Säulen der Startrampe ruhte. Sie diente während der wochenlangen Startvorbereitungen als Witterungsschutz, zur Energieversorgung, Beladung der Transportbucht des Orbiters unter Reinraum-Bedingungen und abschließenden Betankung des Antriebssystems. Von der FSS war in 45 m Höhe über dem Pad die Orbiter-Einstiegleuke mittels eines schwenkbaren Auslegers erreichbar. Im Notfall konnte von hier der Orbiter bis kurz vor dem Start evakuiert und die Besatzung über eine Seilbahngondel von der FSS in Sicherheit gebracht werden. Zur Betankung des Außentanks gab es je einen Betankungsarm für Sauerstoff und flüssigem Wasserstoff. Für den Transport des im Vehicle Assembling Building senkrecht auf der mobilen Startplattform montierten Space Shuttle gab es drei MLP's, die auf einem 6 Meter hohen und 40 Meter langen Crawler Transporter zum 5,5 km entfernten Pad A oder über 6,8 km zum Pad B bewegt wurden. Auf dem Launch Pad angekommen, wurde die MLP mittels 4 Hubsäulen auf sechs festen Sockeln abgelenkt. Waren alle Startvorbereitungen abgeschlossen, erfolgte das Zurückschwenken der RSS. Während des Startvorgangs wurden das Space Shuttle und die Einrichtungen des Launch Pad mittels Wasser gegen den auftretenden Schalldruck geschützt. Dazu ließ man innerhalb von Sekunden rund 1,135 Millionen Liter Wasser über die MLP fließen. Nach dem Ende des Space Shuttle Programms 2011 werden diese Einrichtungen momentan für den Start künftiger Raketen umgebaut.

Technische Daten:

Gesamthöhe der FFS über Niveau Launch Pad: 105,7 m
Höhe Blitzableitermast: 24,4 m
Höhe der RSS: 57,6 m
MLP
Höhe: 7,62 m
Länge: 49 m
Breite: 41 m
Gewicht: 3733 t
Gewicht mit startklarem Shuttle: 5761 t

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Launch Complex 39 is located within the grounds of the John F. Kennedy Space Centre (KSC) at the U.S. Aeronautical and Space Agency (NASA) on the northern end of Cape Canaveral, Merritt Island in Florida. It has two identical launch pads, LC-39A and 2.6 km (1.6 mile) away LC-39B. Since the end of 1968, nearly all NASA's manned Space Flight Missions were launched from here using Saturn rockets. Between 1981 and 2011 after the Apollo program was concluded these facilities were converted in order to support the Space Shuttle program.

Each platform is made of reinforced concrete, is situated about 15 m (49 ft) above sea level, is 119 m (390 ft) long and 100 m (328 ft) wide. Between 1976 and 1985 the 81.3 (267 ft) meter high steel supply towers with all the necessary supply lines, cranes, stairs, elevators and a horizontal swivel arm - the Rotating Service Structure (RSS) - with the Payload Change-out Room attached were erected on both launch pads. As soon as the Mobile Launch Platform (MLP) supporting the external tank, two boosters and the Orbiter mounted in its launch position is resting on the six launch pad pillars, the RSS is rotated towards the Shuttle. During the week-long launch preparations, it served to protect the Shuttle from the weather, to supply power, to load the transporter hold and for final refuelling of the propulsion system. The Orbiter access hatch was accessed at a height of 45 meters (148 ft) above the launch pad from the RSS via a pivoting access arm. In an emergency before take-off, the Orbiter crew could be quickly evacuated from here, placed in a cable car cabin and be lowered from the FSS to safety. To refuel the external tank, there was one refuelling arm for oxygen and one for liquid hydrogen.

To transport the Space Shuttle standing vertically in the Vehicle Assembling Building, there were three MLP's. These were carried on a 6 meter (18 ft) high and 40 meter (125 ft) long crawler transporter to Pad A, 5.5 km (3.4 miles) away or to Pad B 6.8 km (4.2 miles). Once at the Launch Pad, the MLP was lowered onto six fixed stanchions by four lifting jacks. When all take-off preparations were completed, the RSS was swung back towards the tower. During take-off, the Space Shuttle and launch facilities were protected against damaged from the enormous sound wave pressure by water. To achieve this about 1.135 million litres of water were sprayed over the MLP within a few seconds. Since the end of the Space Shuttle Program in 2011, these facilities are being rebuilt in order to facilitate the launch future rockets.

Technical Data:

Total height of the FSS above Launch Pad Level: 105,7 m (347 ft)
Height of the Lightning Conductor Mast: 24,4 m (80 ft)
Height of the RSS: 57,6 m (189 ft)
MLP
Height: 7,62 m (25 ft)
Length: 49 m (161 ft)
Width: 41 m (135 ft)
Weight: 3733 t
Weight with Shuttle ready for Take-off: 5761 t

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Verwendete Symbole / Used Symbols

Bitte beachten Sie folgende Symbole, die in den nachfolgenden Baustufen verwendet werden.
Veuillez noter les symboles indiqués ci-dessous, qui sont utilisés dans les étapes suivantes du montage.
 Sírvase tener en cuenta los símbolos facilitados a continuación, a utilizar en las siguientes fases de construcción.
SI prega di fare attenzione ai seguenti simboli che vengono usati nei susseguenti stadi di costruzione.
 Lueksi seurauvat symbolit, jotta käytetään seuraavissa kokonaisuissa.
Legg i merke til symbolene som benyttes i monteringsstremene som følger.
 Proszę zwracać na następujące symbole, które są użyte w poniższych etapach montażowych.
Daha sonra montaj basamaklarında kullanılan olan, aşağıdaki sembollere lütfen dikkat edin.
 Kérjük, hogy a következő szimbólumokat, melyek az alábbi építési fokokban alkalmazásra kerülnek, vegyék figyelembe.

Please note the following symbols, which are used in the following construction stages.
Neem a.u.b. de volgende symbolen in acht, die in de onderstaande bouwfasen worden gebruikt.
 Por favor, preste atenção aos símbolos que seguem pois os mesmos serão usados nas próximas etapas de montagem.
Observera: Nedanstående piktogram används i de följande arbetsmomenten.
 Lag vnljgst merke til følgende symboler, som benyttes i de følgende byggestr. **Пожалуйста, обратите внимание на следующие символы, которые используются в последующих операциях сборки.**
 Παρακαλώ προσέξτε τα παρακάτω σύμβολα, τα οποία χρησιμοποιούνται στις παρακάτω βαθμίδες συναρμολόγησης.
Дбејте просим на даље уведенe симболи, кeрe се позујувају у наредјуких конструкцијских ступицих.
 Prosimo za Vašu pozornost na sledeće simbole ki se uporabljajo v naslednjih korakih gradbe.

 <p>Abziehbild in Wasser einweichen und anbringen Soak and apply decals Mouiller et appliquer les décalcomanies Transfer in water even laten weken en aanbrengen Remojir y aplicar las calcomanías Pôr de molho em água e aplicar o decalque Immergere in acqua ed applicare decalcomanie Blôt och fást dekalerna Kostuta silrtokuvu vedessä ja aseta paikalleen Overføringsbilledet lægges i blød og anbringes Dyrp bildet i vann og sett det på Декали намочить и нанести на поверхность Zmęczyć kalkomanie w wodzie a następnie nakleić Προηγήστε τη χλωμόμανία στο νερό και τοποθετήστε την Çikartmayı suda yumuşatın ve koyun Obtisk namočite ve vodě a umistěte a matricát vızben beažtatni éš felhelyezni Preslikač potopiti v vodo in zatem nanašati</p>	 <p>Zur Anbringung der Abziehbilder empfohlen Recommended for affixing the decals Recommandé pour l'application des décalcomanies Aanbevolen voor het aanbrengen van de transfers Recomendado para fijar las calcas Posição recomendada para aplicar os decalques Raccomandato per applicare le decalcomanie Rekommenderas för montering av dekaler Anbefales til påsætning og påsætning af decals РЕКОМЕНДУЄТЬСЯ ДЛЯ ФІКСАЦІЇ ДЕКАЛЕЙ НА ПОВЕРХНОСТІ МОДЕЛІ карпінки на поверхности модели Zaleca się do nakleśnienia kalkomanii Συνιστάται για την επικόλληση των επικατών. Dekalierin ypp-sitmismissä kullamisessa lausjyše edillir Pfliveneit na zlepljeni pfliveneosti obdosi Matrica légyit Pfliveneit na pfliveneosti nalepk Odpofucané na zleplenie pfliveneosti nalepk RECOMANDAT PENTRU APLICAREA ACTIVILORILOR Подporуцo за флксациа на картини чeрyу поверхности на модели</p>	 <p>Kleben Glue Coller Lijmen Engomar Colar Incollare Limmas Limaa Klæbling Lim Kleben Przykleić κόλλημα Yapıştırma Lepeni ragasztani Lepiti</p>	 <p>Nicht kleben Don't glue Ne pas coller Niet lijmen No engomar Não colar Non incollare Limmas ej Älä limaa Må ikke klæbes Ikke lim Не клеить Nie przyklejać μη κολλάτε Yapıştırma Nelepiti nem szabad ragasztani Ne lepiti</p>	 <p>Wahlweise Facultatif Naar keuze No engomar Alternado Facoltativo Valfrtt Valhtohtoisesti Efter eget valg Valgrtt На выбор Do wyboru εναλλακτικά Seçmeli Volitelné tetszés szerint način izbire</p>	 <p>Klebeband Adhesive tape Dévidoir de ruban adhésif Plakband Cinta adhesiva Fita adesiva Nastro adesivo Tejp Tejpri Tape Tape На выбор Taşma klejaca κολλητική ταινία Yapıştırma bandı Volitelné ragasztószalag Traka z lepilom</p>	 <p>Klarsichtteile Clear parts Pièces transparentes Transparente onderdelen Limpiar las piezas Peça transparente Parte transparente Genomsiktiga detaljer Läpinäkyvät osat Gennemsigtige dele Gennomsiktige deler Прозрачные детали Elementy przezroczyste διαφανή εξαρτήματα Şeffaf parçalar Průzračné díly áttetsző alkatrészek Deil ki se jasno vide</p>
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 <p>Gleichen Vorgang auf der gegenüberliegenden Seite wiederholen Repeat same procedure on opposite side Opérer de la même façon sur l'autre face Dezelfde handeling herhalen aan de tegenoverliggende kant Realizar el mismo procedimiento en el lado opuesto Repetir o mesmo procedimento utilizado no lado oposto Stessa procedura sul lato opposto Upprepa proceduren på motsatta sidan Toista sama toimenpide kuten vieresellä sivulla Det samme arbejde gentages på den modsatliggende side Gjenta prosedyren på siden tværs overfor Повторить действие на оборотной стороне Takí sam přezběhč zpusnoči rotovýř na stionie přezvěiněj επαναλάβετε την ίδια διαδικασία στην απέναντι πλευρά Aynı işlemleri karşı tarafta tekrarlayın Stejný postup zopakovat na protilehání straně ugyanzat a folyamokat a szemben taláható oldalon megismételni Isti postopek ponoviti in na suprotni strani</p>	 <p>Abbildung zusammengesetzter Teile Illustration of assembled parts Figure représentant les pièces assemblées Afbeelding van samengevoegde onderdelen Ilustración piezas ensambladas Figura representando peças encaixadas Ilustrazione delle parti assemblate Bilden visar delarna hopsatta Kuva yhteennillitetyistä osista Illustration af sammensatte dele Ilustrasjon, sammensatte deler Изображение собранных деталей Rysunek złożonych części απεικόνιση των συναρμολογημένων εξαρτημάτων Birleştirilen parçaların şekli Zobrazení sestavených dílů összeállított alkatrészek ábrája Silka slopljenega dela</p>	 <p>Mit einem Messer abtrennen Detach with knife Détacher au couteau Met een mesje afsnijden Separarlo con un cuchillo Separar utilizando uma faca Staccare col coltello Skär loss med kniv Irrotta veitsellä Adskilles med en kniv Skjær av med en kniv Отделять ножом Odciać nożem διαχωρίστε με ένα μαχαίρι Yarı bıçak ile kesin Oddělit pomocí nože kés segítségével leválasztani Oddelili z nožem</p>	 <p>Bauteile trocken lassen Allow the parts to dry Laisser sécher les pièces Ouderdelen laten drogen Dejar secar las piezas Deixar secar os componentes Far aslugdara i component Anna osien kuivua La delene tørke Lad komponenterne tørre Låt byggdelarna torra Дать деталям высохнуть Części pozostawić do wyschnięcia Αφήστε τα μέρη να στεγνώσουν Yarı parçalarını kurumaya bırakınız Alkatrészeket hagyja száradni Jednotlivé díly nechte zaschnout Pusitite da sestavni deli posušijo</p>	 <p>Anzahl der Arbeitsgänge Number of working steps Nombre d'étapes de travail Het aantal bouwstappen Número de operaciones de trabajo Número de etapas de trabalho Numero di passaggi Antal arbetsmoment Tölvaiheiden lukumäärä Antal arbejdsforløb Antal arbejdsstrinn Количество операций Liczba operacji αριθμός των εργασιών İş sayfalarmın sayısı Počet pracovných operaci munkafolyamatok száma Številka koraka montaže</p>
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 NL: Houdt u aan de bijgaande veiligheidsinstructies en hou deze steeds bij de hand.
E: Observar y siempre tener a disposición este texto de seguridad adjunto.
 I. Seguire le avvertenze di sicurezza allegate e tenerle a portata di mano.
P: Ter em atenção o texto de segurança anexo e guardá-lo para consulta.
 S: Beakta bifogad säkerhetstext och håll den i beredskap.
FIN: Huomioi ja säilytä ohjeet varoitukset.

DK: Overhold vedlagte sikkerhedsanvisninger og hav dem liggende i nærheden.
N: Ha alltid vedlagt sikkerhetstekst klar til bruk.
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Benöiigte Farben / Used Colors

Benöiigte Farben
Required colours

Peintures nécessaires
Benöiigte kleuren

Pinturas necesarias
Tintas necesarias

Colori necessari
Använda färger

Tarvittavat värt
Du trenger følgende farger

Nödvide farger
Необходимые краски

Potrzebne kolory
Απαιτούμενα χρώματα

Gerekti renkler
Potřebné barvy

Szükséges színek
Potrebne barve

90 %

1.

10 %

AK

2.

BK

CK

80 %

DK

20 %

EK

holzbraun, seidenmatt 382 +
wood brown, silky-matt
brun bois, satiné mat
houlbrun, zijdemat
marrón madera, mate seda
castanho madeira, fosco sedoso
marrone legno, opaco seta
träbrun, sidenmatt
puunkeske, silkinhimmeä
träbrun, sidenmatt
trebrun, silkematt
древесно-органевый, шелк.-матовый
drewnobrazowy, jedwabisto-matowy
καφέ ξύλου, μεταξωτό ματ
odun kahverengisi, ipek mat
hnědá barvy dřeva, hedvábně mat.
fabarna, selyemmatt
drevo plava, svila mat

weiß, matt 5
white, matt
blanc, mat
wit, mat
blanco, mate
branco, fosco
bianco, opaco
vit, matt
valkoinen, himmeä
hvít, mat
белый, матовый
biały, matowy
λευκό, ματ
beyaz, mat
bilá, matná
fehér, matt
bela, mat

farbløs, matt 2
clear, matt
incoloro, mat
kleurloos, mat
incoloro, mate
incolor, fosco
trasparente, opaco
färglös, himmeä
värdön, himmeä
larvels, mat
klar, matt
бесцветный, матовый
bezbarmy, matowy
αχρωμό, ματ
renksiz, mat
bezbarevná, matná
szintelen, matt
brezbarvna, mat

Afrikabraun, matt 17
Africa brown, matt
Brun Afrique, mat
Afrikabruin, mat
Marrón africano, mate
Castanho-africano, mate
Bruno africano, opaco
Afrikabruin, matt
Khakiruskea, matná
Afrikabruin, mat
Afrika-brun, matt
Африкано-коричневый, матовый
Braz afrykanski, matowy
Καφέ Αφρικής, ματ
Afrika kahverengisi, mat
Afrikabarna, matt
Afriická hnědá, matná
Afriškorjava, brez leska

braun, matt 85
brown, matt
brun, mat
bruin, mat
marrón, mate
castanho, fosco
marrone, opaco
brun, matt
ruskea, himmeä
brun, mat
brun, matt
коричневый, матовый
brązowy, matowy
καφέ, ματ
kahverengi, mat
hnědá, matná
barna, matt
rjava, mat

Afrikabraun, matt 17 +
Africa brown, matt
Brun Afrique, mat
Afrikabruin, mat
Marrón africano, mate
Castanho-africano, mate
Bruno africano, opaco
Afrikabruin, matt
Khakiruskea, matná
Afrikabruin, mat
Afrika-brun, matt
Африкано-коричневый, матовый
Braz afrykanski, matowy
Καφέ Αφρικής, ματ
Afrika kahverengisi, mat
Afrikabarna, matt
Afriická hnědá, matná
Afriškorjava, brez leska

weiß, seidenmatt 301
white, silky-matt
blanc, satiné mat
wit, zijdemat
blanco, mate seda
branco, fosco sedoso
bianco, opaco seta
vit, sidenmatt
valkoinen, silkinhimmeä
hvít, silkematt
белый, шелковисто-матовый
biały, jedwabisto-matowy
λευκό, μεταξωτό ματ
beyaz, ipek mat
bilá, hedvábně matná
fehér, selyemmatt
bela, svila mat

grau, matt 57
grey, matt
gris, mat
grís, mat
grigio, mate
cinzento, fosco
grigio, opaco
grá, mat
harmaa, himmeä
grá, mat
grá, mat
серый, матовый
szary, matowy
γκρι, ματ
grí, mat
šedá, matná
szürke, matt
siva, mat

50 %

FK

50 %

GK

HK

95 %

IK

5 %

JK

KK

hellgrau, seidenmatt 371 +
light grey, silky-matt
gris clair, satiné mat
lichtgrís, zijdemat
gris claro, mate seda
cinzento claro, fosco sedoso
grigio chiaro, opaco seta
lysgrá, sidenmatt
vaaleanharmaa, silkinhimmeä
lysgrá, silkematt
светло-серый, шелковисто-матовый
jasnoszary, jedwabisto-matowy
ανοιχτό γκρι, μεταξωτό ματ
arkí grí, ipek mat
světlesědá, hedvábně matná
világosszürke, selyemmatt
svetto siva, svila mat

weiß, seidenmatt 301
white, silky-matt
blanc, satiné mat
wit, zijdemat
blanco, mate seda
branco, fosco sedoso
bianco, opaco seta
vit, sidenmatt
valkoinen, silkinhimmeä
hvít, silkematt
белый, шелковисто-матовый
biały, jedwabisto-matowy
λευκό, μεταξωτό ματ
beyaz, ipek mat
bilá, hedvábně matná
fehér, selyemmatt
bela, svila mat

eisen, metallic 91
steel, metallic
coloris fer, métallique
ijzerkleurig, metallic
ferroso, metalizado
ferro, metálico
ferro, metallico
järnfarig, metallic
teräskemväräinen, metallikiilto
jern, metallak
jern, metallic
стальной, металл
želazo, metaliczny
σιδηρού, μεταλλικό
demir, metalik
železná, metaliza
vas, metáll
železna, metalik

anthrazit, matt 9
anthracite grey, matt
anthraote, mat
antraot, mat
antraota, mate
antraote, fosco
antraote, opaco
antraoti, matt
antrasiti, himmeä
koksgrá, mat
antrasit, matt
антрацит, матовый
antracyt, matowy
ανθρακί, ματ
antrasit, mat
antracit, matná
antracit, matt
tarmo siva, mat

blaugrau, matt 79 +
greyish blue, matt
gris-blu, mat
blauwgrís, mat
gris azulado, mate
cinzento azulado, fosco
grigio blu, opaco
blágrá, mat
sinharmaa, himmeä
blágrá, mat
blágrá, mat
синеватый, матовый
γκριζομπλέ, ματ
mavi grí, mat
modrosědá, matná
kékesszürke, matt
plavo siva, mat

weiß, seidenmatt 301
white, silky-matt
blanc, satiné mat
wit, zijdemat
blanco, mate seda
branco, fosco sedoso
bianco, opaco seta
vit, sidenmatt
valkoinen, silkinhimmeä
hvít, silkematt
белый, шелковисто-матовый
biały, jedwabisto-matowy
λευκό, μεταξωτό ματ
beyaz, ipek mat
bilá, hedvábně matná
fehér, selyemmatt
bela, svila mat

grau, seidenmatt 374
grey, silky-matt
gris, satiné mat
grís, zijdemat
gris, mate seda
cinzento, fosco sedoso
grigio, opaco seta
grá, sidenmatt
harmaa, silkinhimmeä
grá, silkematt
серый, шелковисто-матовый
jasnoszary, jedwabisto-matowy
γκρι, μεταξωτό ματ
grí, ipek mat
šedá, hedvábně matná
szürke, selyemmatt
siva, svila mat

aluminium, metallic 99
aluminium, metallic
aluminium, métallique
aluminium, metallic
aluminio, metalizado
aluminio, metalico
aluminium, metallic
alumiini, metallikiilto
aluminium, metallak
aluminium, metallic
алюминиевый, металл
aluminium, metaliczny
αλουμινίου, μεταλλικό
aluminium, metalik
hliniková, metaliza
aluminium, metáll
aluminium, metalik

LK

MK

NK

OK

PK

QK

RK

weiß, matt 5
white, matt
blanc, mat
wit, mat
blanco, mate
branco, fosco
bianco, opaco
vit, matt
valkoinen, himmeä
hvít, mat
белый, матовый
biały, matowy
λευκό, ματ
beyaz, mat
bilá, matná
fehér, matt
bela, mat

panzergrau, matt 78
tank grey, matt
gris blindé, mat
pantsergrís, mat
plomizo, mate
cinzento militar, fosco
color carro armato, opaco
pansargrá, mat
panssariharmaa, himmeä
kampvogngrá, mat
pansergrá, matt
серый танк, матовый
szary czołg, matowy
γκρι τανκς, ματ
panzer grisi, mat
pancéřové šedá, matná
páncéřszürke, matt
oklopno siva, mat

silber, metallic 90
silver, metallic
argent, métallique
zilver, metalic
plata, metalizado
prata, metálico
argento, metalico
silver, metallic
hopea, metallikiilto
solv, metallak
solv, metallic
серебристый, металл
srebro, metaliczny
szary, jedwabisto-matowy
μούρο, μεταξωτό ματ
siyah, ipek mat
černá, hedvábně matná
fekete, selyemmatt
črna, svila mat

schwarz, seidenmatt 302
black, silky-matt
noir, satiné mat
zwart, zijdemat
negro, mate seda
preto, fosco sedoso
nero, opaco seta
svart, sidenmatt
musta, silkinhimmeä
sort, silkematt
черный, шелковисто-матовый
szary, jedwabisto-matowy
μούρο, μεταξωτό ματ
siyah, ipek mat
černá, hedvábně matná
fekete, selyemmatt
črna, svila mat

weiß, matt 5
white, matt
blanc, mat
wit, mat
blanco, mate
branco, fosco
bianco, opaco
vit, matt
valkoinen, himmeä
hvít, mat
белый, матовый
biały, matowy
λευκό, ματ
beyaz, mat
bilá, matná
fehér, matt
bela, mat

staubgrau, matt 77
dust grey, matt
gris poussière, mat
stofgrís, mat
cencioento, mate
cinzento de pó, fosco
grigio sabbia, opaco
dammggrá, mat
pöyhäharmaa, himmeä
stovgrá, mat
stovgrá, mat
серый пыльный, матовый
szary kurz, matowy
χρώμα σκόνης, ματ
toz grisi, mat
prachové šedá, matná
porszürke, matt
prah siva, mat

hellgrau, seidenmatt 371
light grey, silky-matt
gris clair, satiné mat
lichtgrís, zijdemat
gris claro, mate seda
cinzento claro, fosco sedoso
grigio chiaro, opaco seta
lysgrá, sidenmatt
vaaleanharmaa, silkinhimmeä
lysgrá, silkematt
светло-серый, шелковисто-матовый
jasnoszary, jedwabisto-matowy
ανοιχτό γκρι, μεταξωτό ματ
arkí grí, ipek mat
světlesědá, hedvábně matná
világosszürke, selyemmatt
svetto siva, svila mat



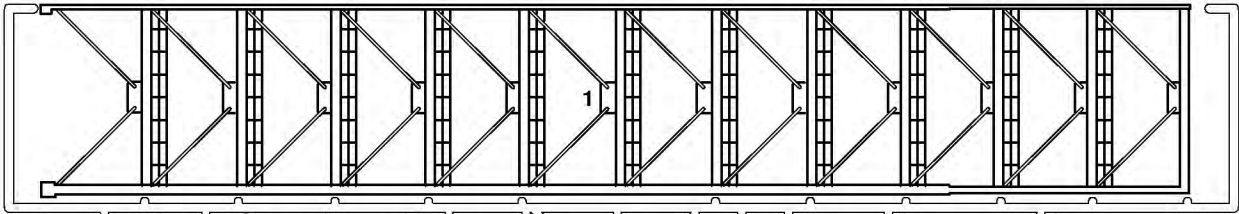
Nicht benötigte Teile
Parts not used
Pièces non utilisées
Niet benodigde onderdelen
Piezas no necesarias
Peças não utilizadas
Parti non usate
Inte använda delar
Tarpeettomat osat
Ikke nødvendige dele
Deler som ikke er nødvendige
Неиспользуемые детали
Elementy niepotrzebne
μη χρειαζόμενα εξαρτήματα
Gereksiz parçalar
Nepotřebné díly
fel nem használt alkatrészek
Nepotrebni deli

1.

Zusammenbau-Reihenfolge
Sequence of assembly
Ordre d'assemblage
Volgorde van montage
Orden de montaje
Ordine di montaggio
Ordem de montagem
Monteringsrekkefølge
Kokoaamisjärjestys
Monteringsföljd
Rækkefølgen af monteringen
Последовательность монтажа
Összeszerelési sorrend
Ακολουθία συναρμολόγησης
Kurmak-Sıra
Kolejność montażu
Vrstni red sestavljanja
Montáž - postup

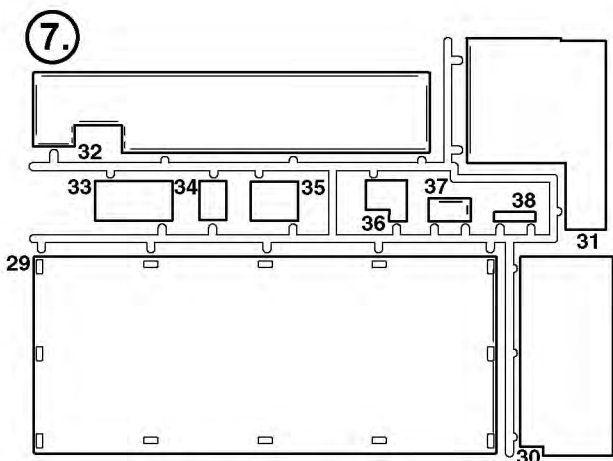
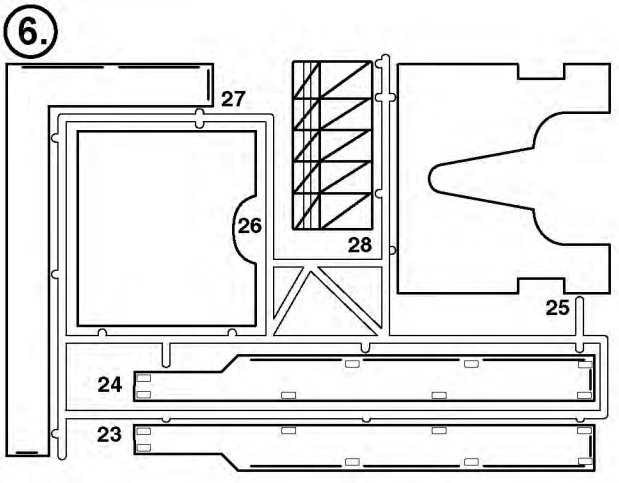
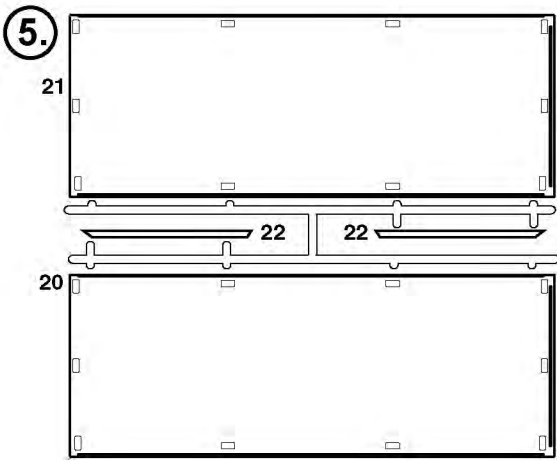
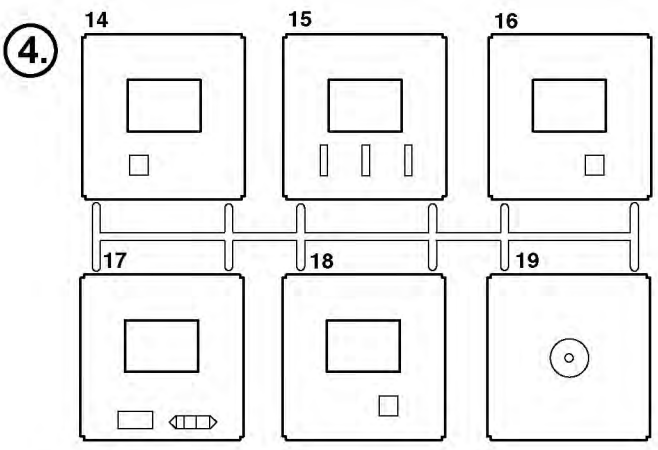
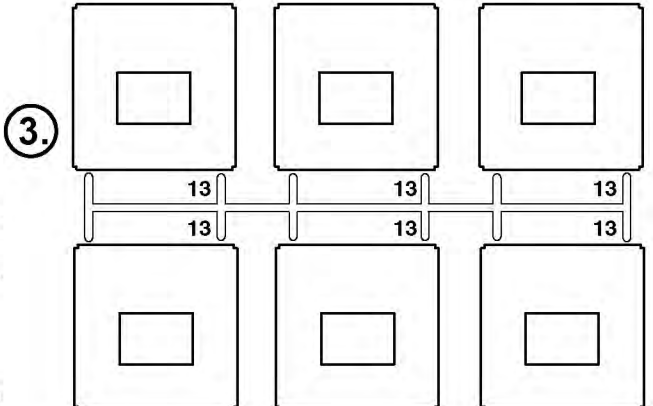
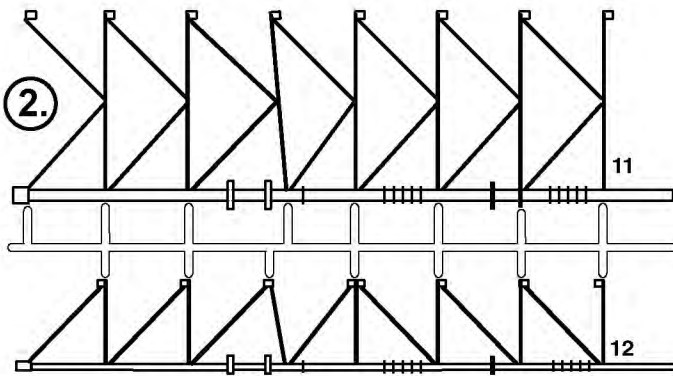
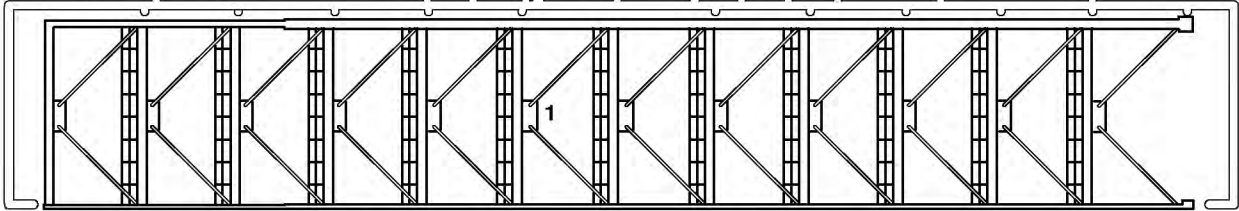
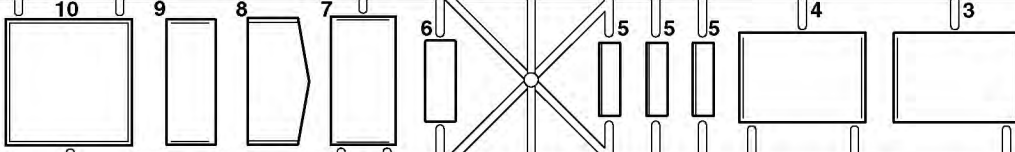


Geländer auf Länge schneiden und Enden verkleben
Cut rails to length and glue ends
Couper les barres, à la bonne longueur et coller les extrémités
Snij reling op lengte af en lijm de uiteinden
Kutt rekverket i riktig lengde og fest endene
Kapa ræcken till rätt längd och limma ändarna
Taglia le ringhiere alla misura opportuna e incollate
Cortar los carriles a la longitud deseada y pegar los extremos

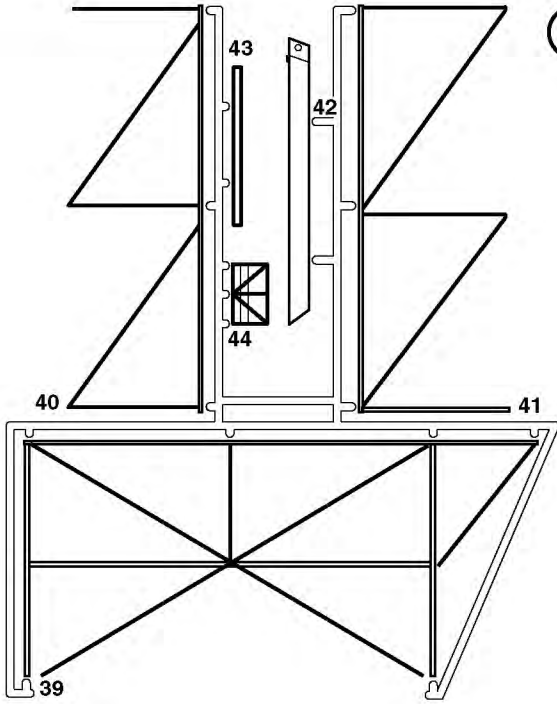


1.

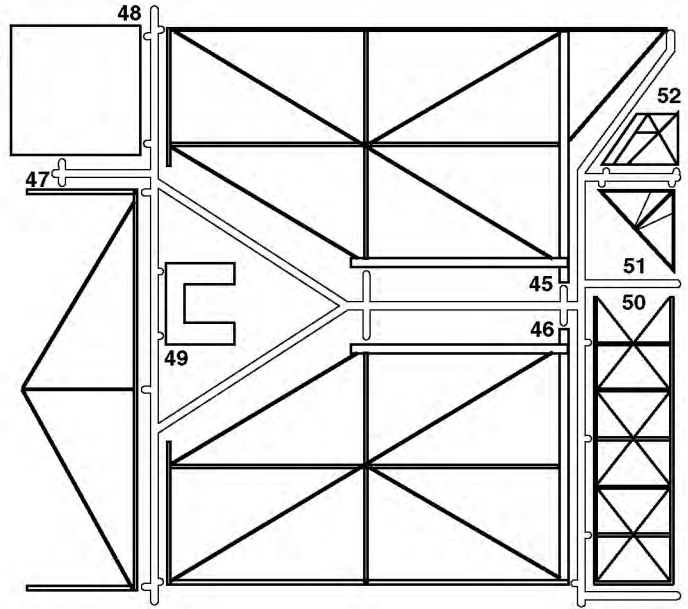
2x



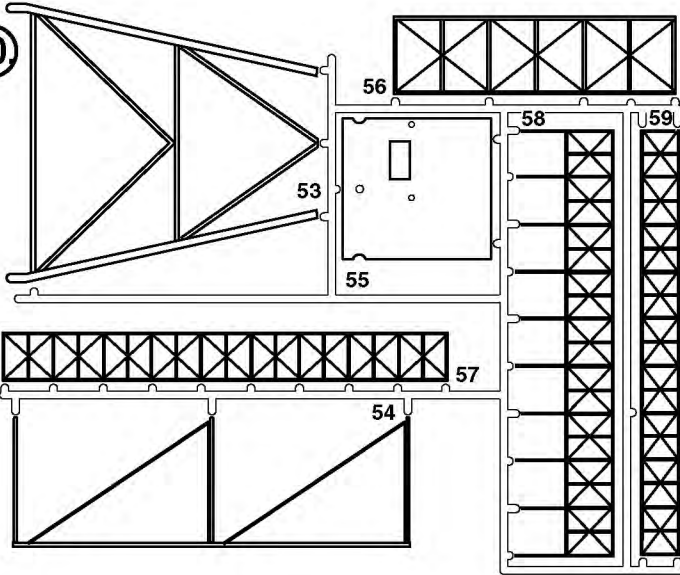
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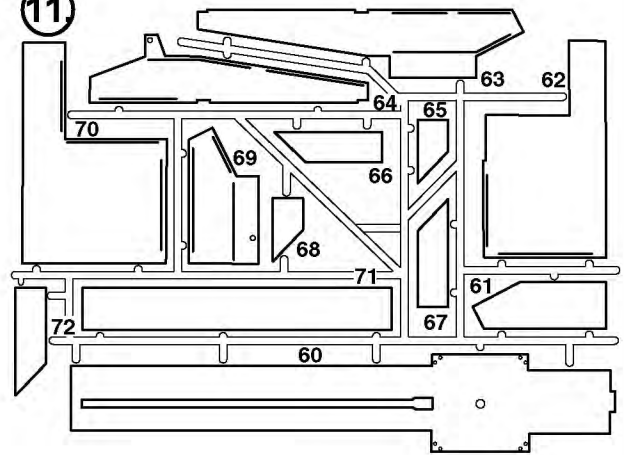
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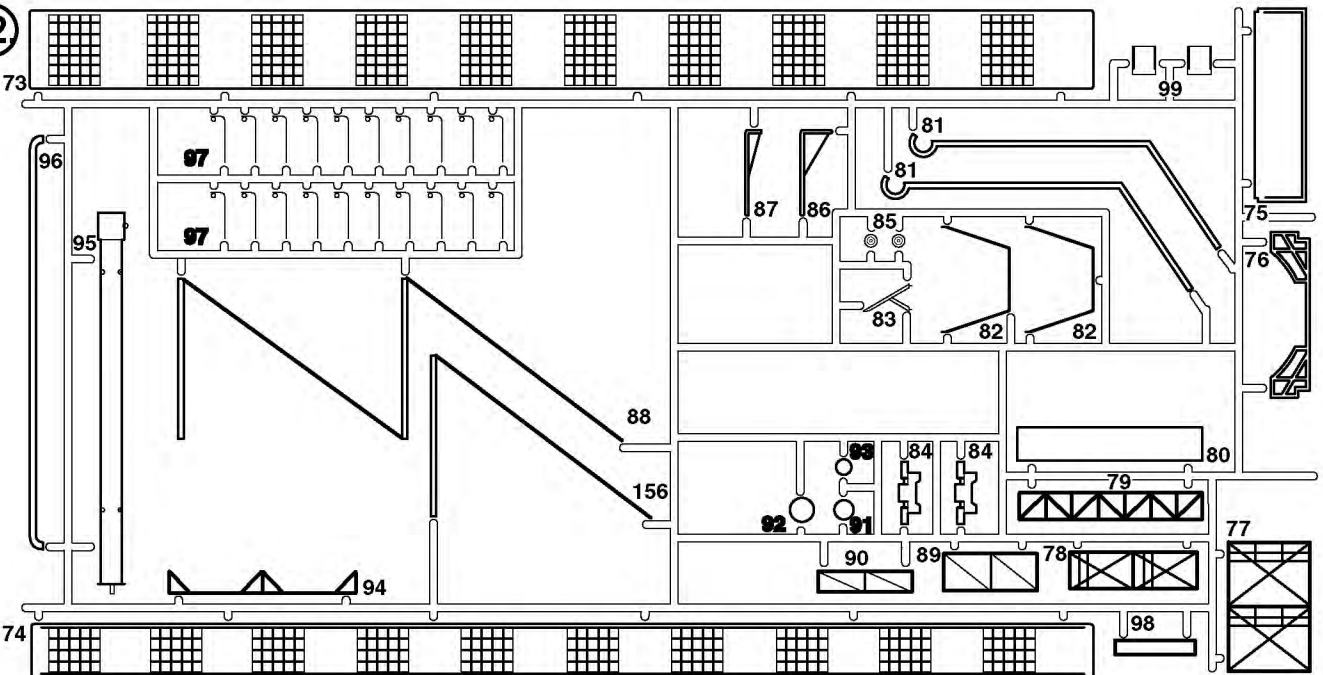
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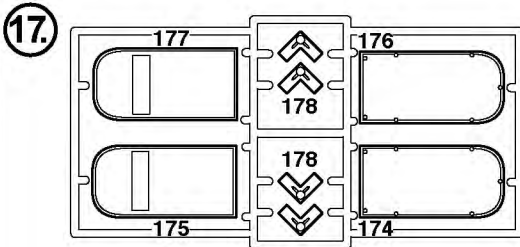
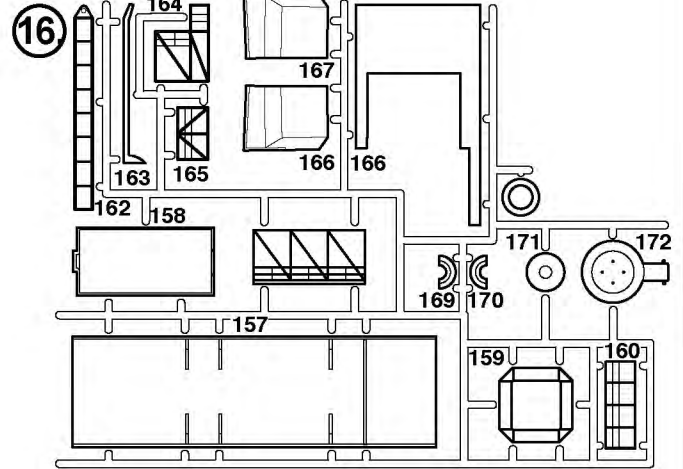
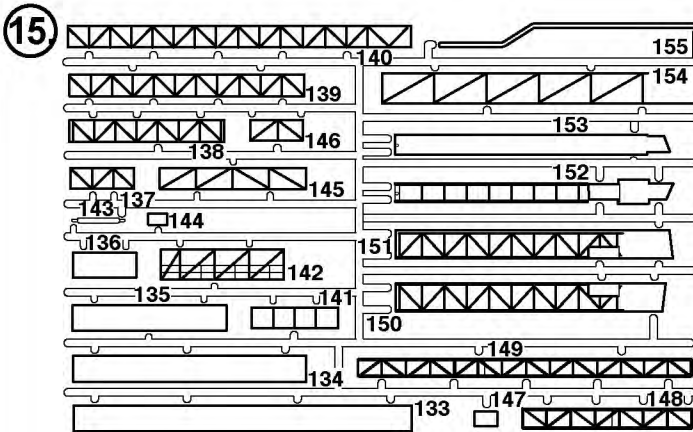
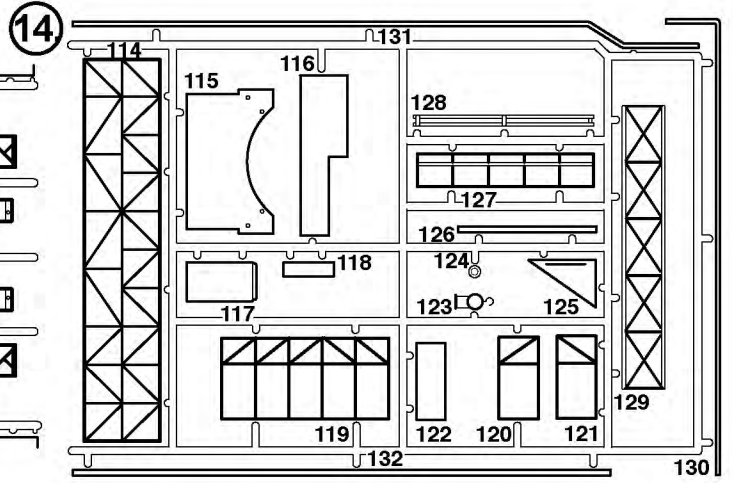
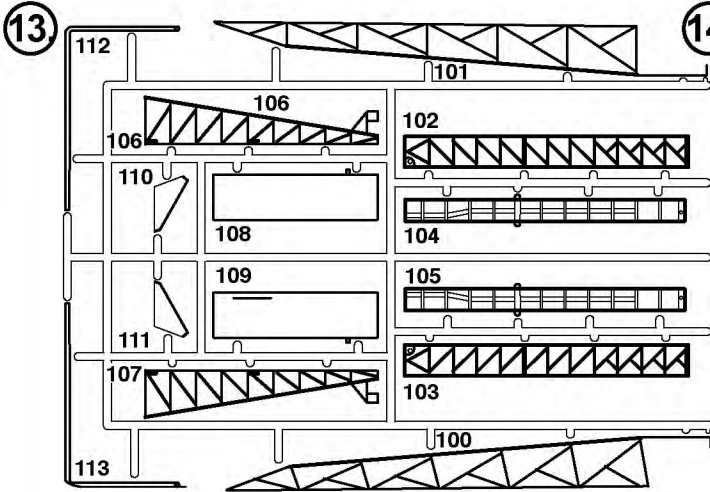


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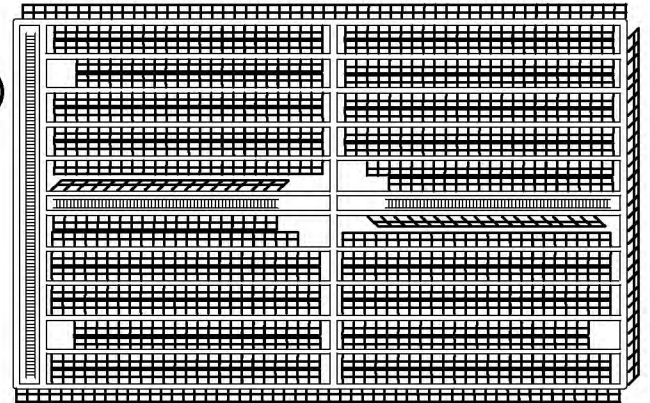


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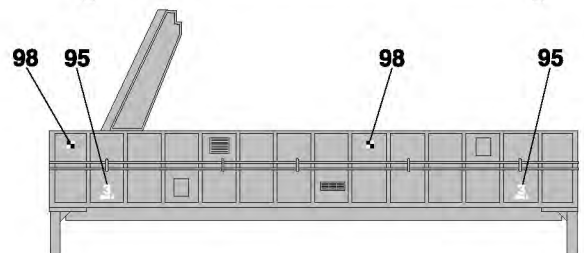
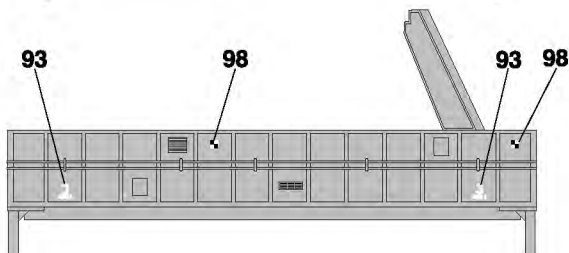
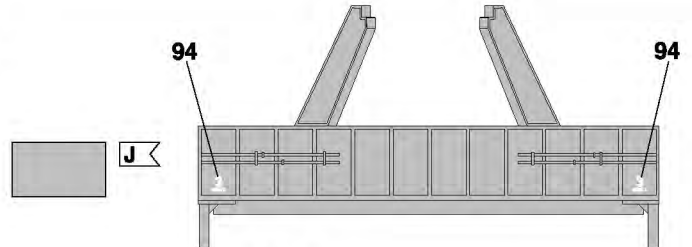
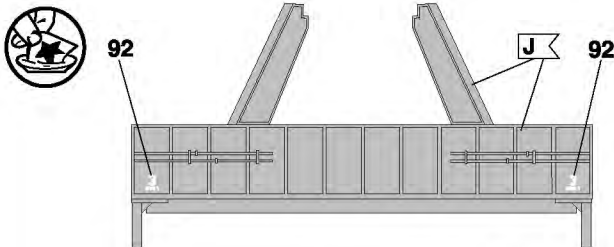




2x

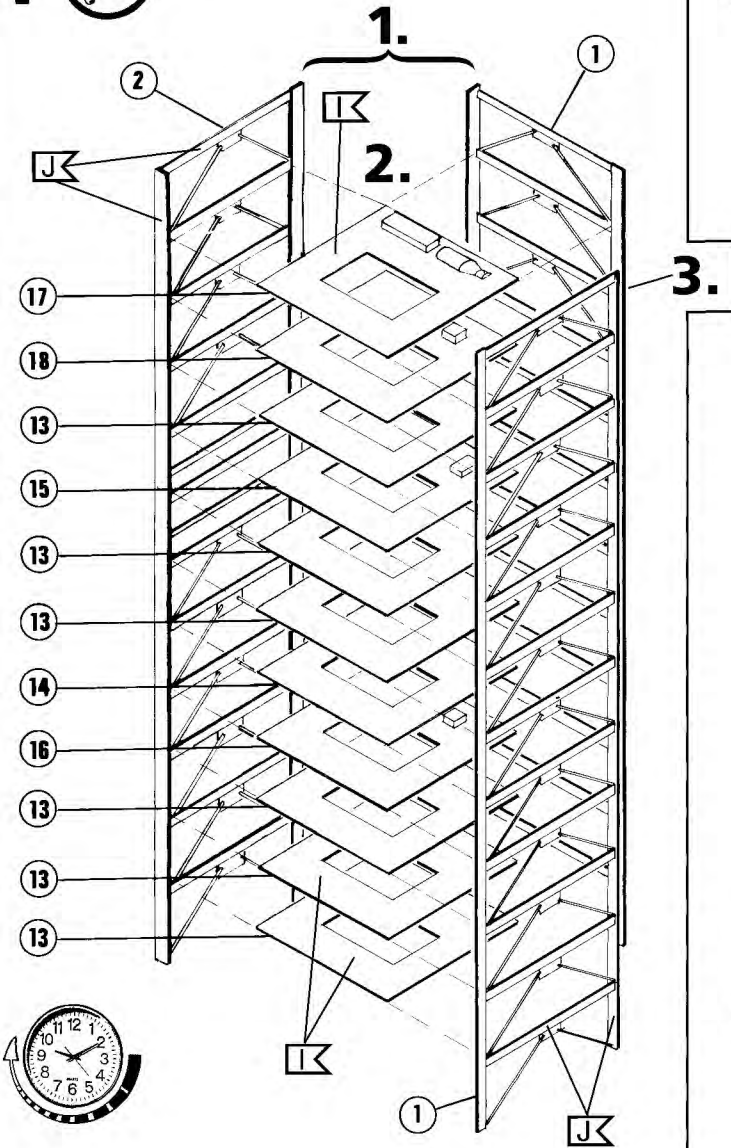


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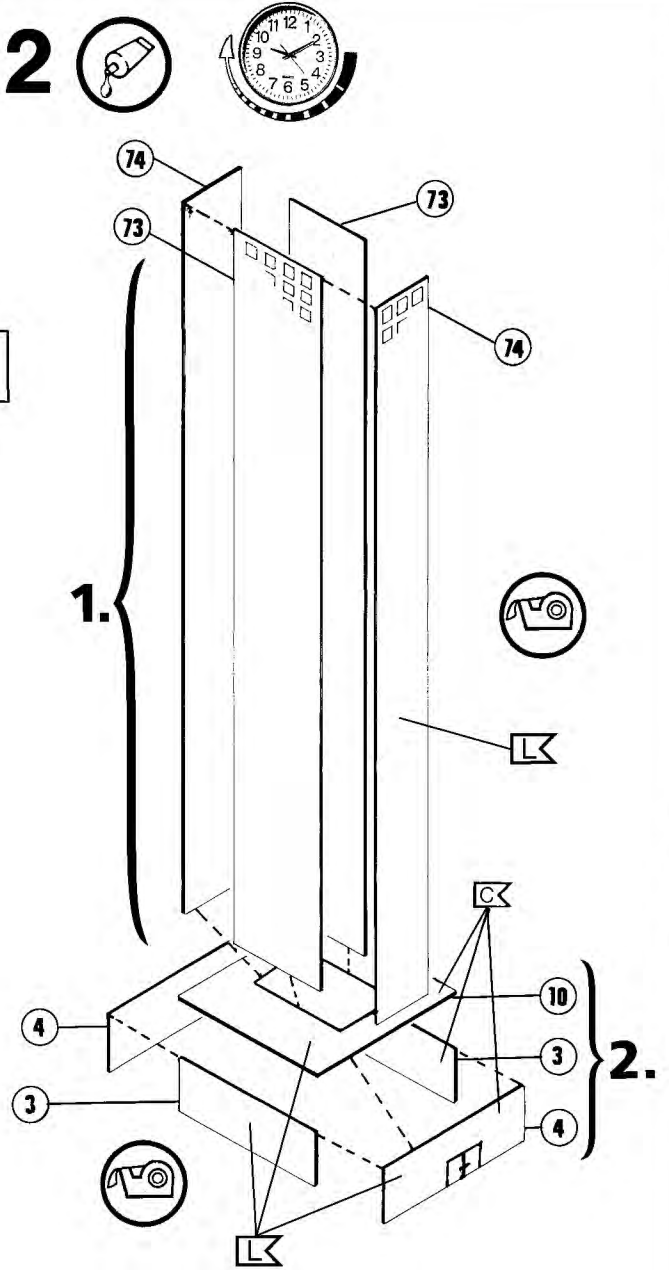


Launch Tower

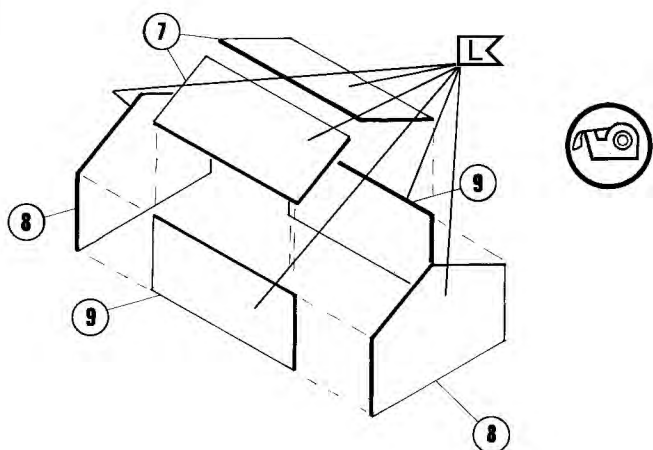
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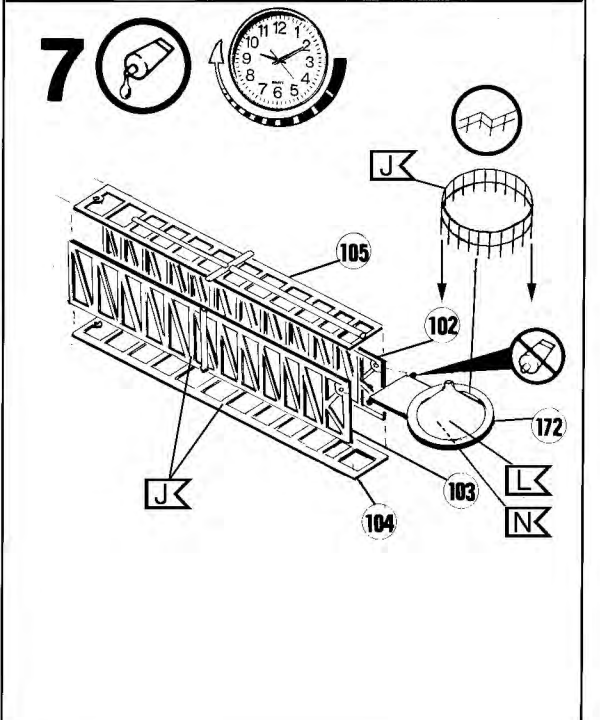
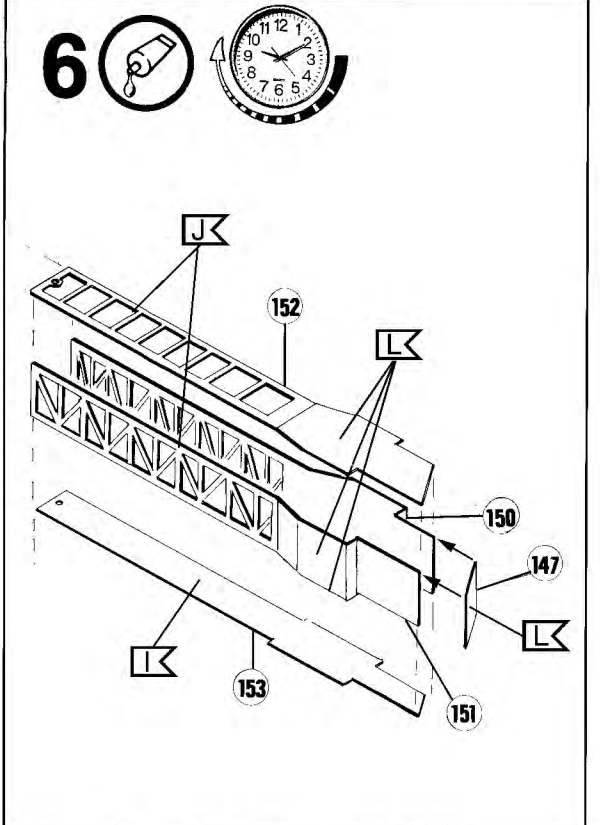
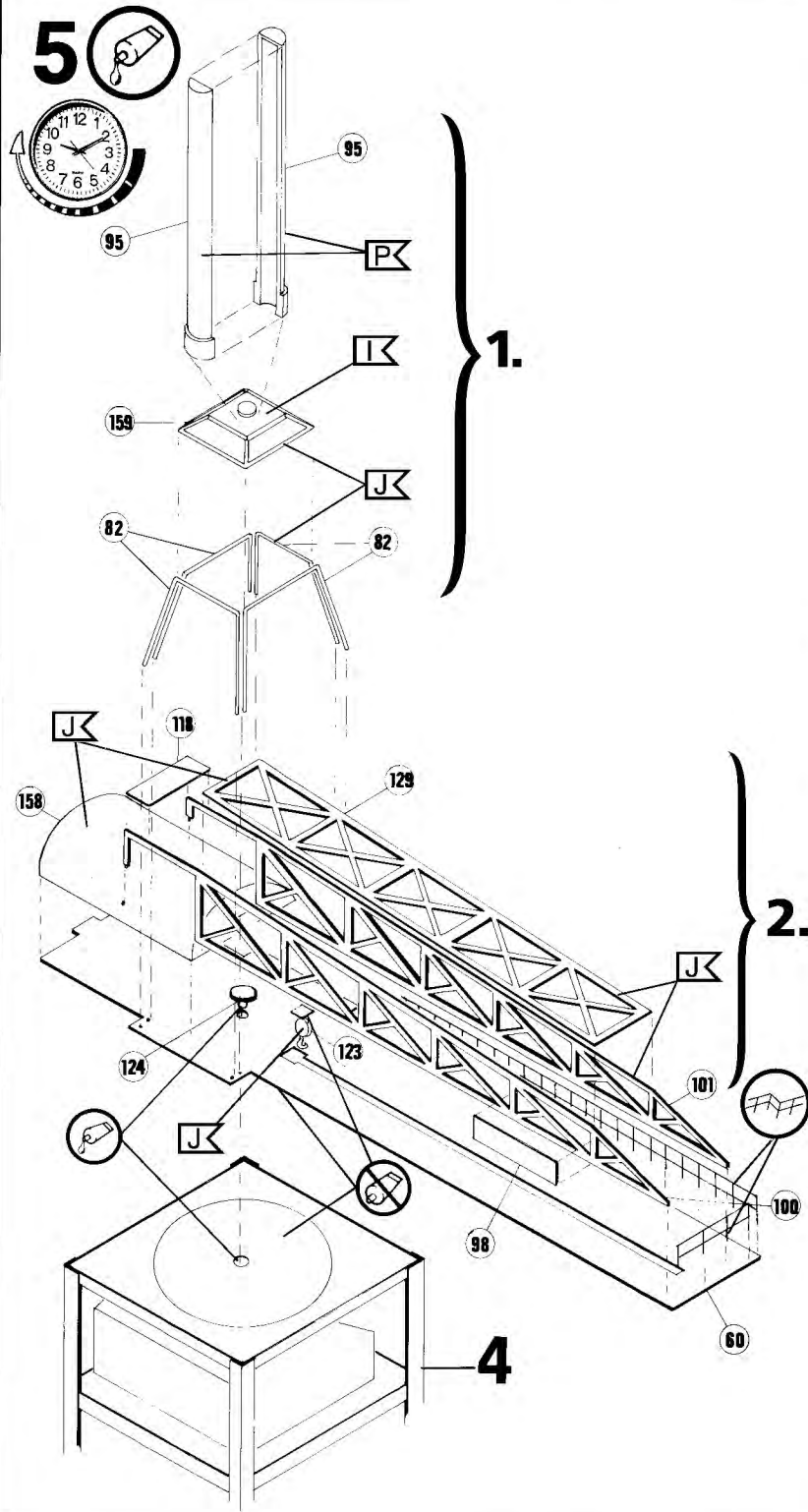
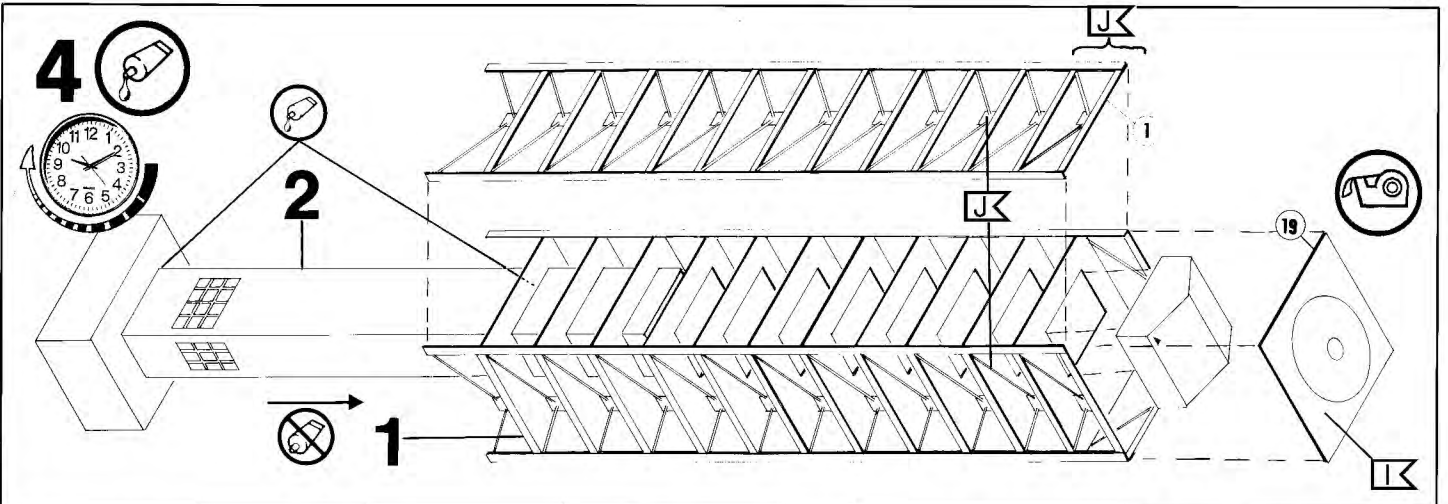


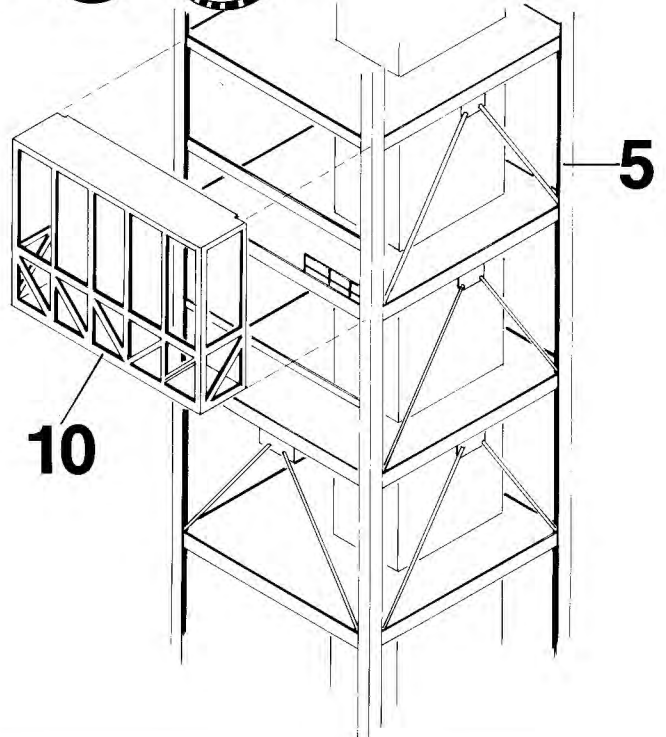
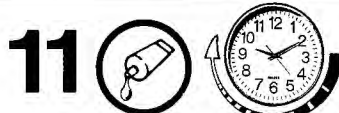
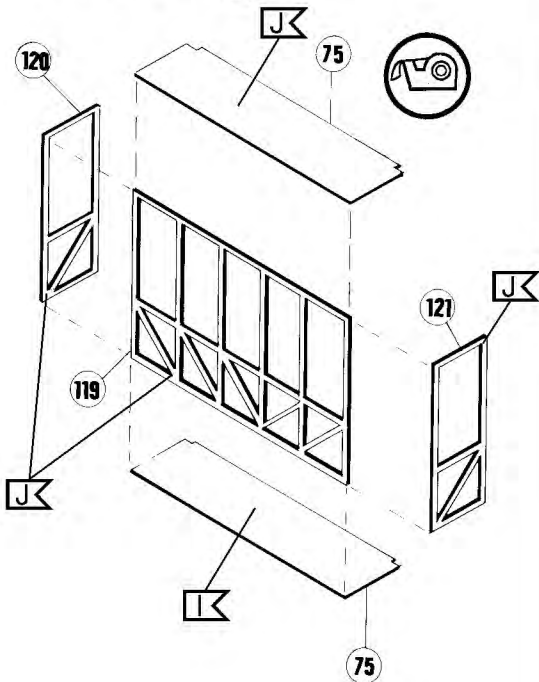
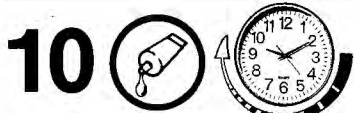
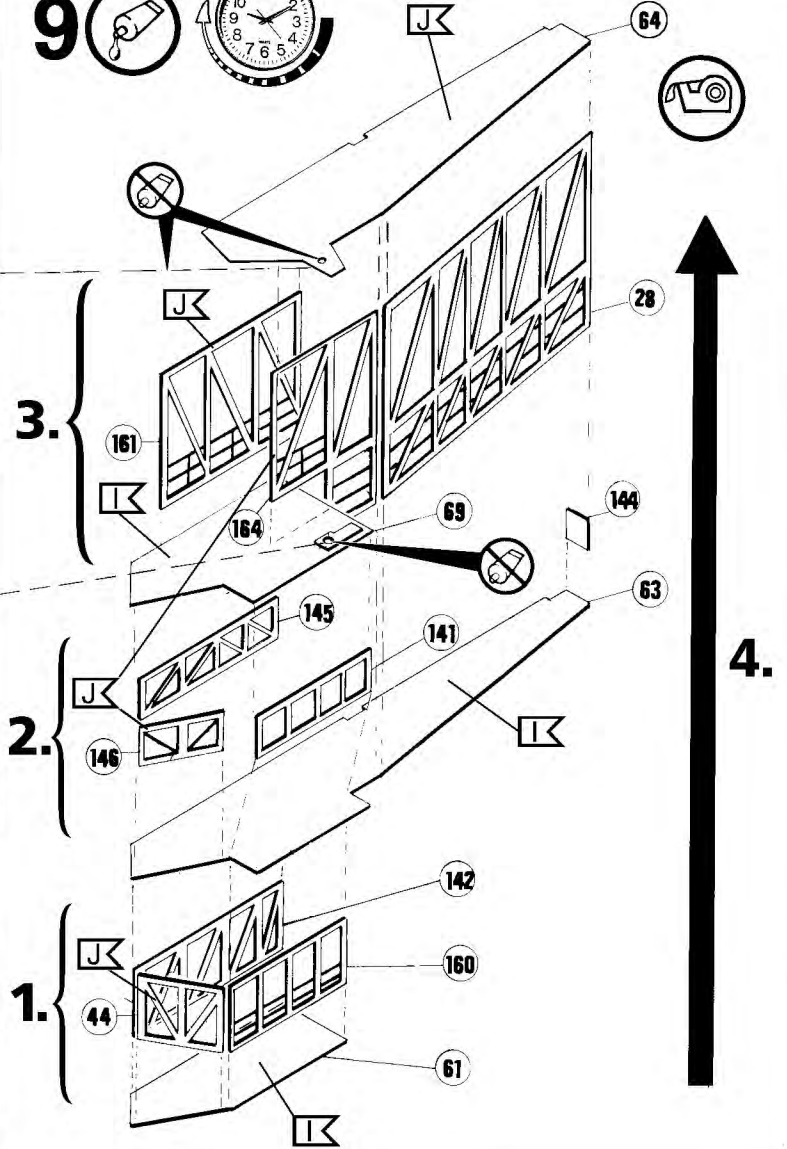
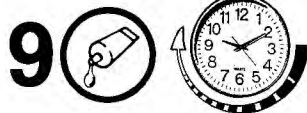
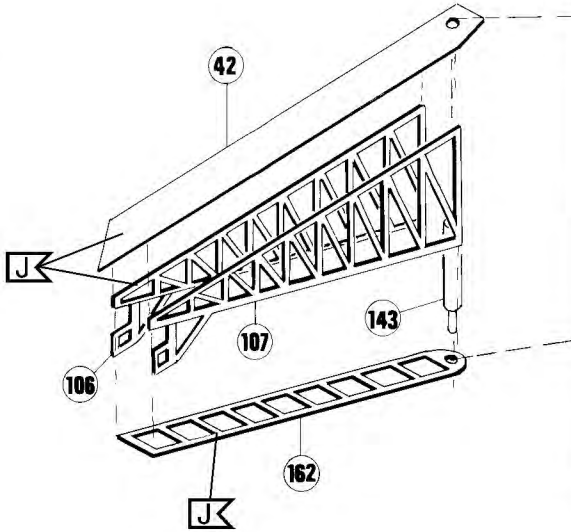
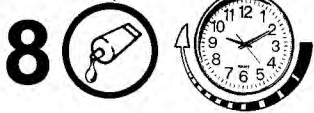
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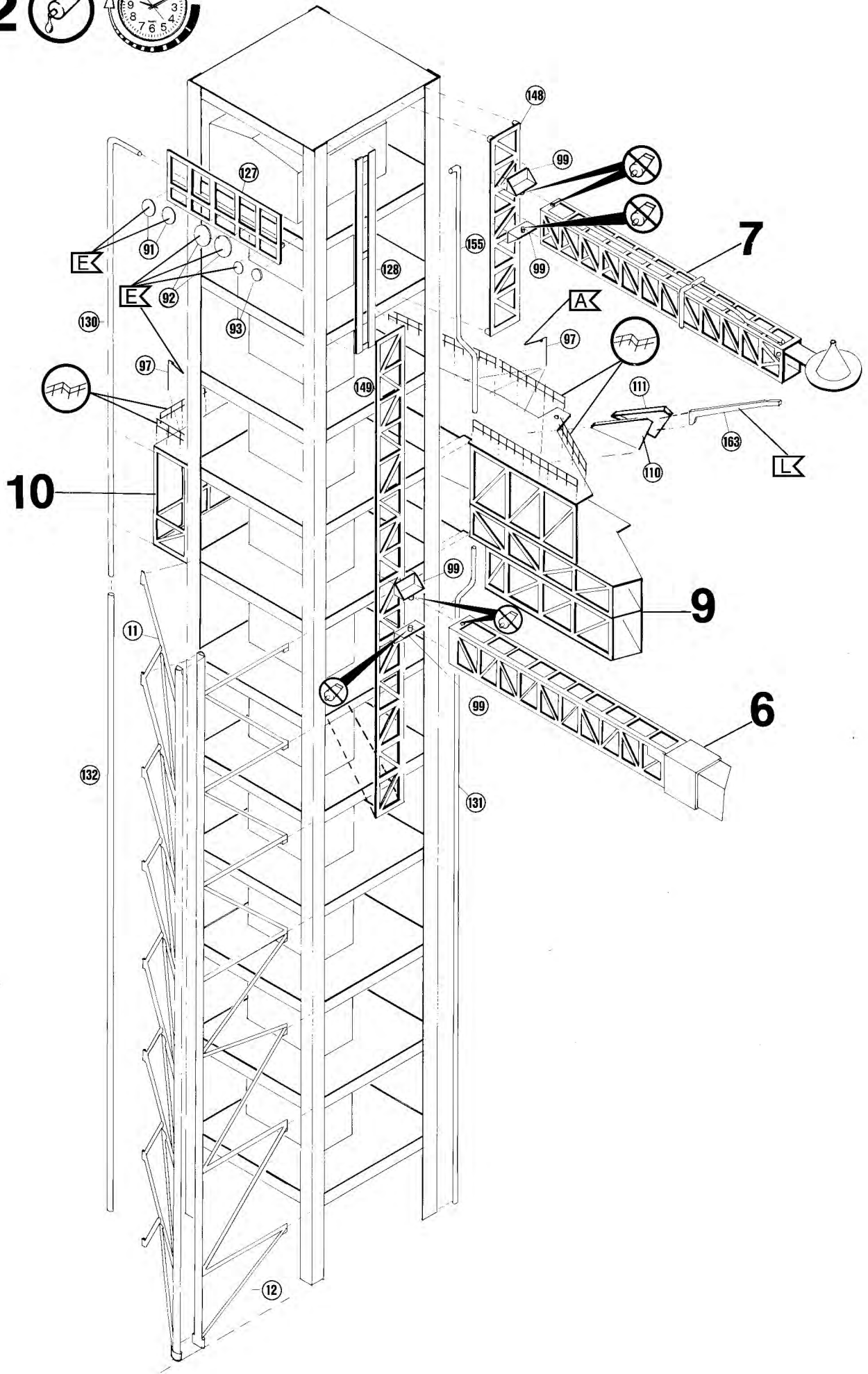
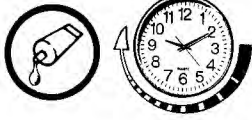
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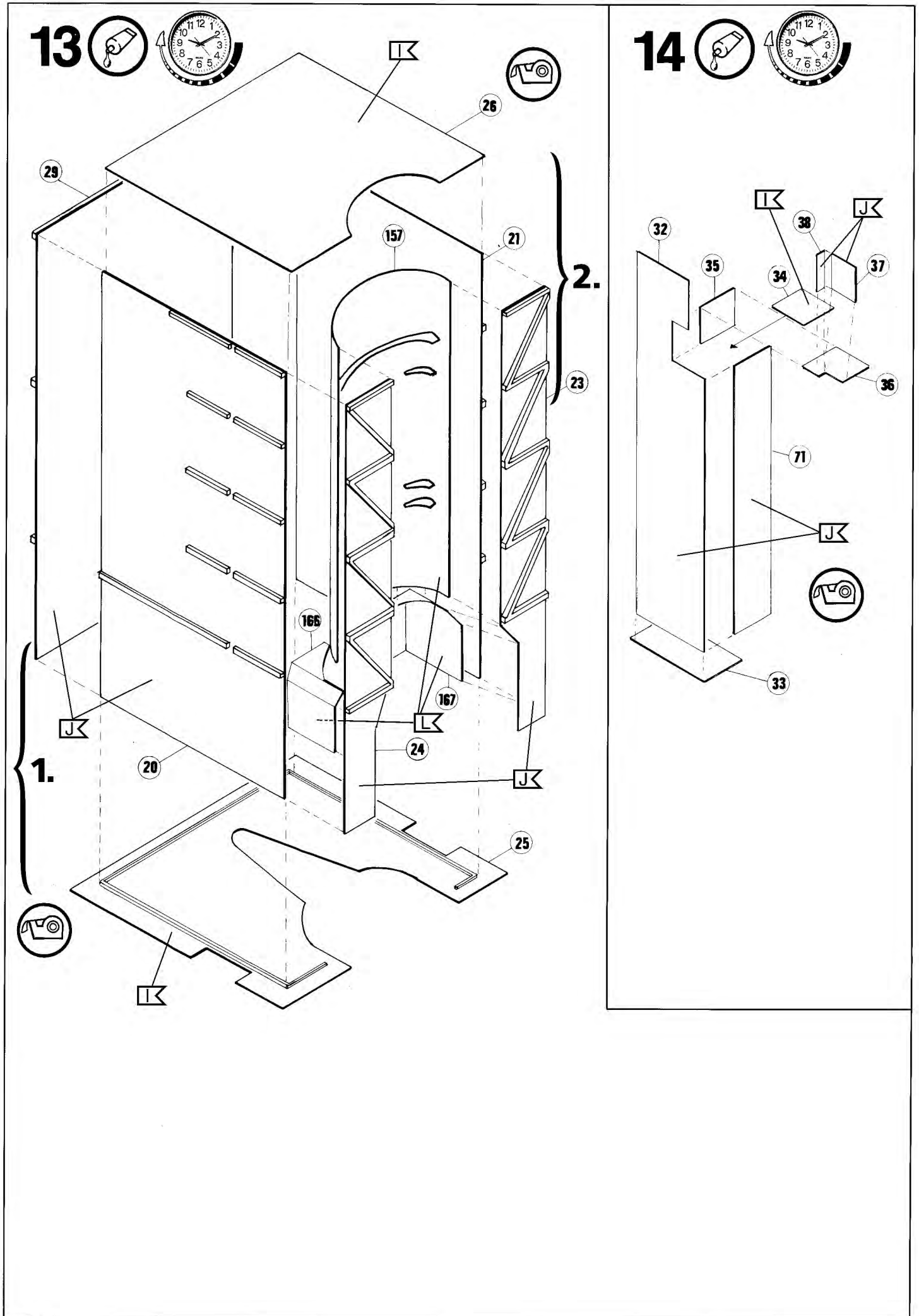




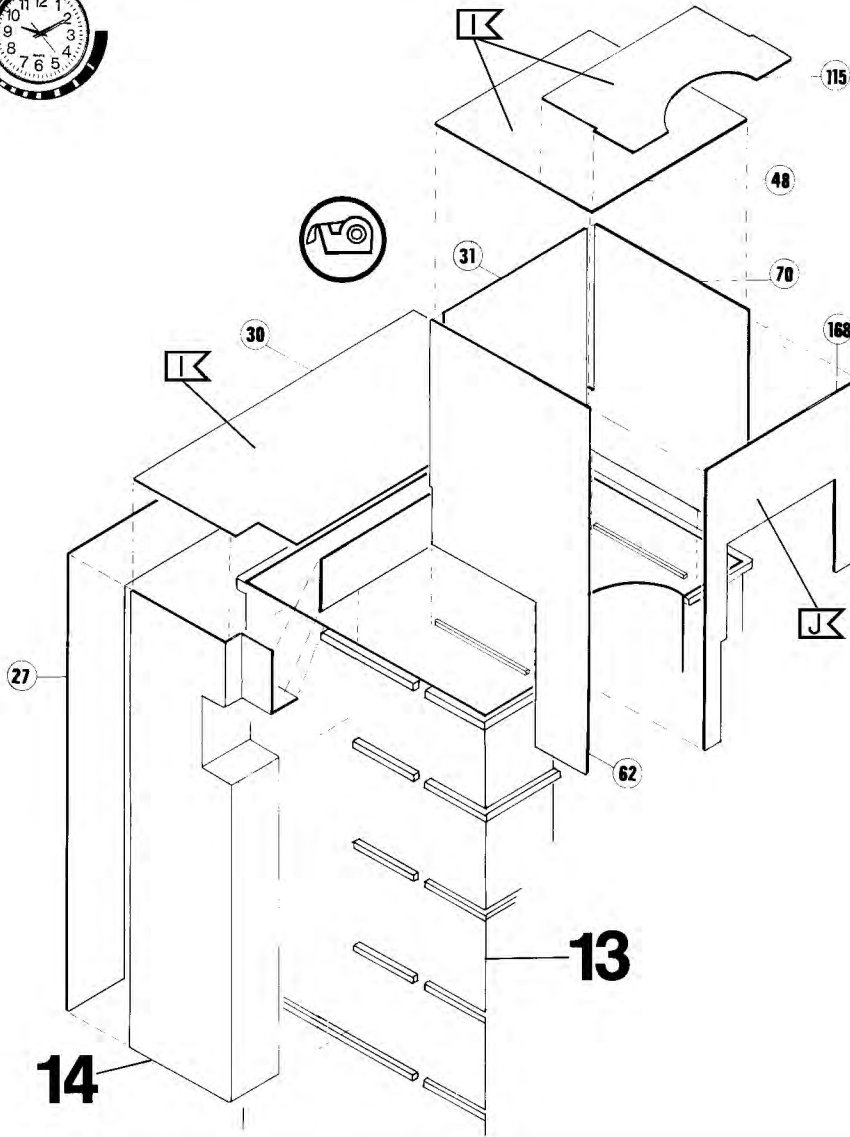


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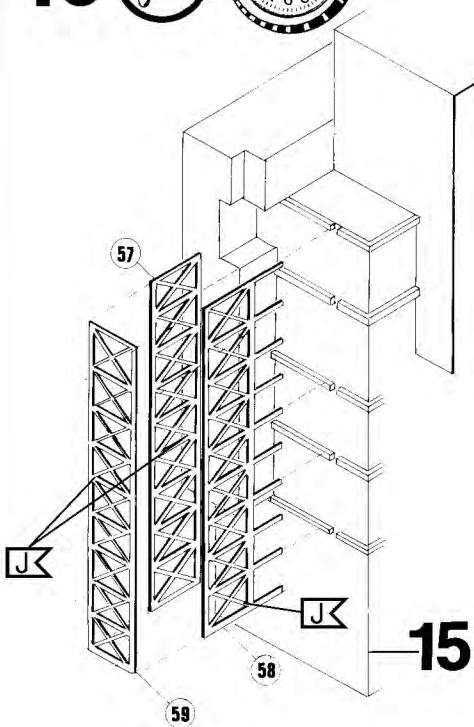
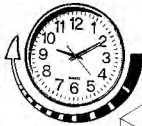




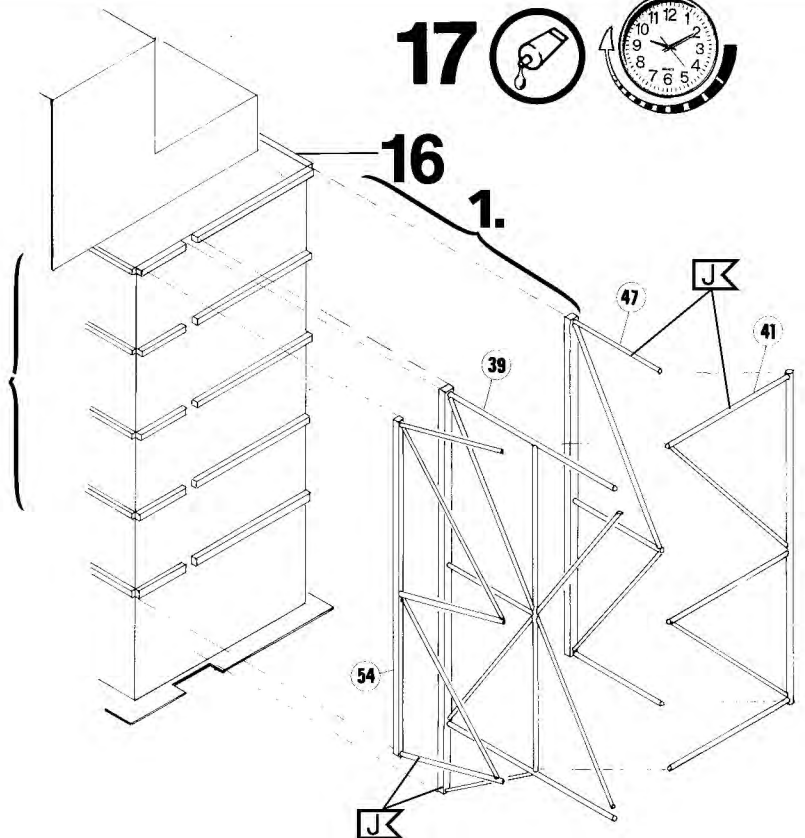
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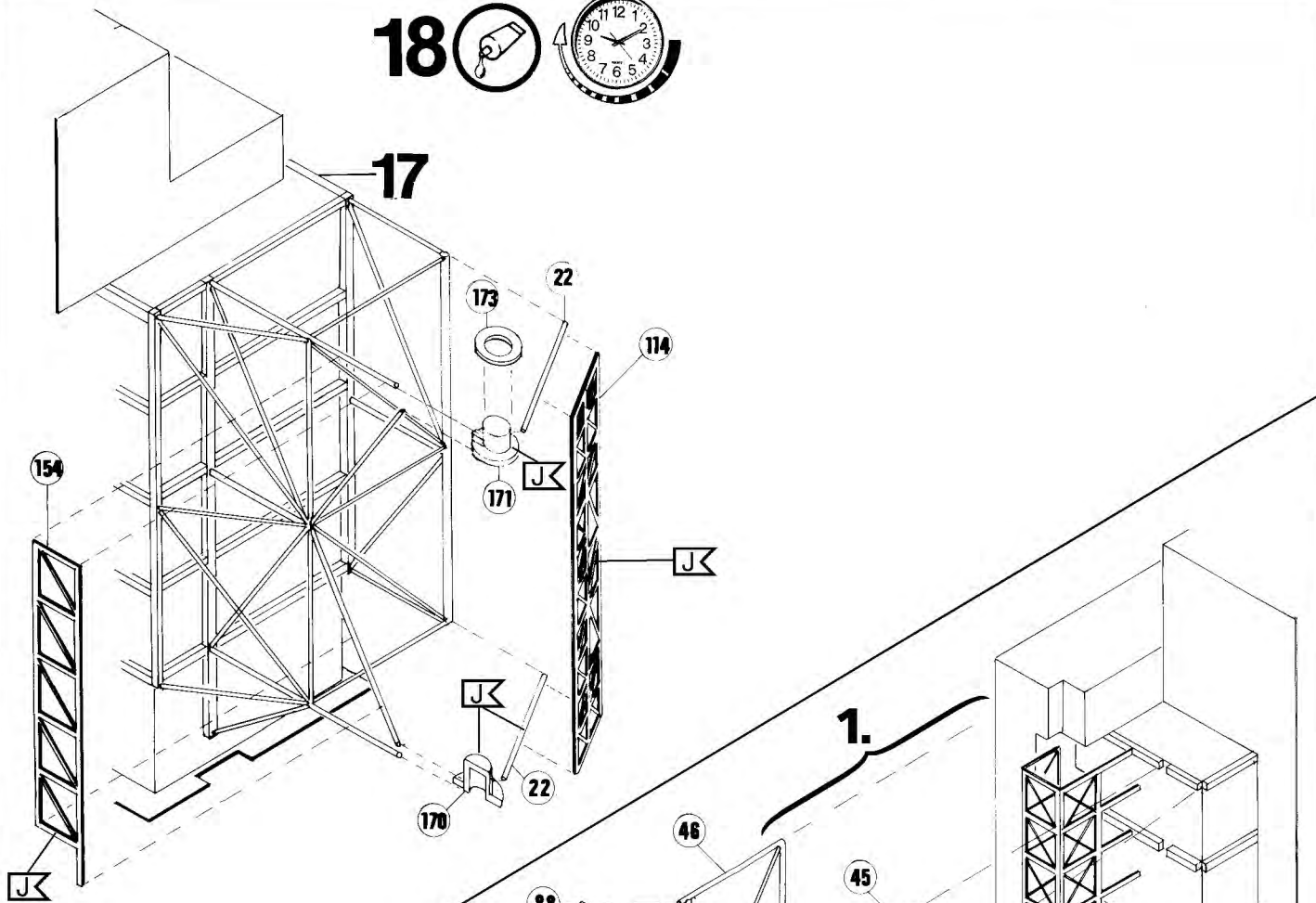
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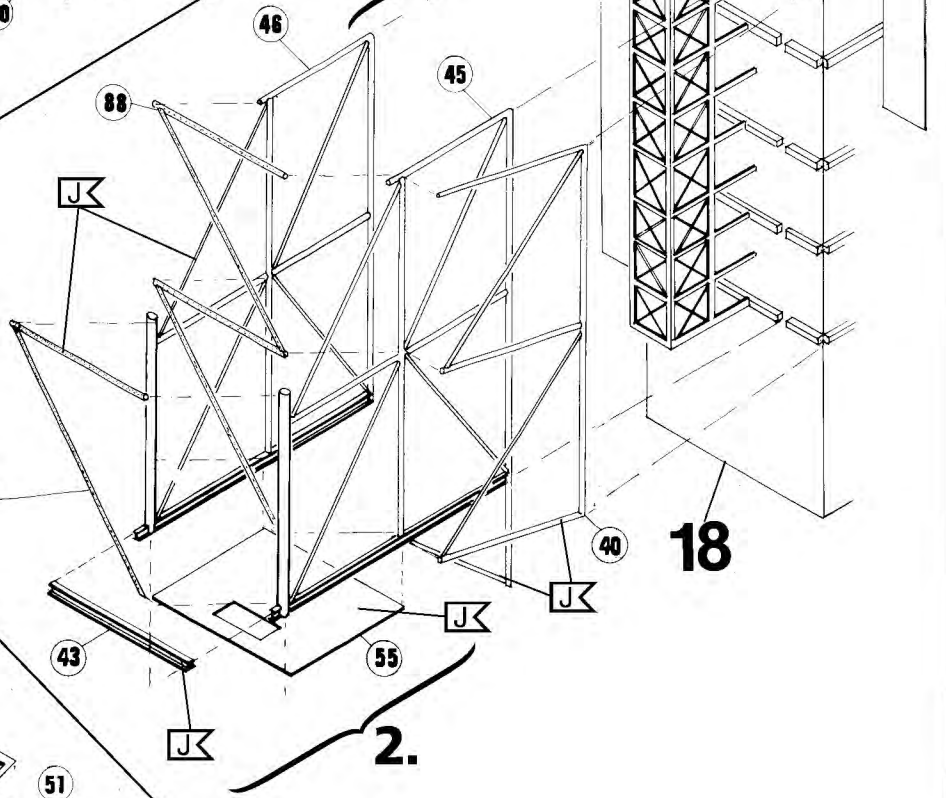
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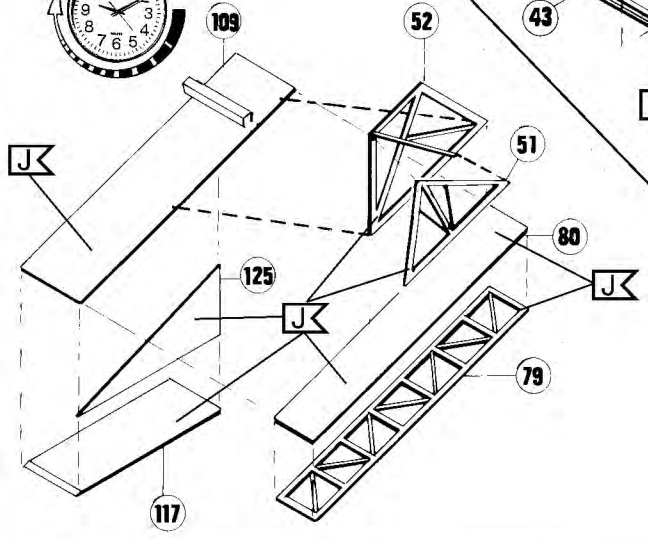
18



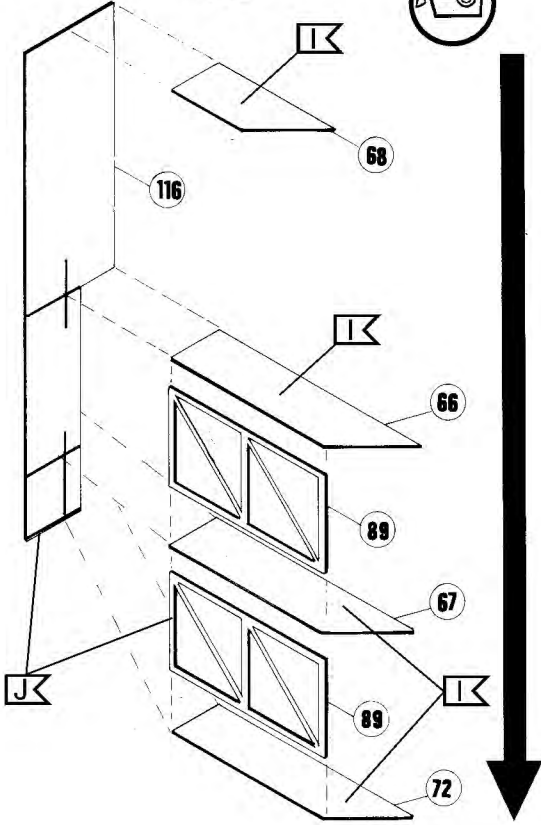
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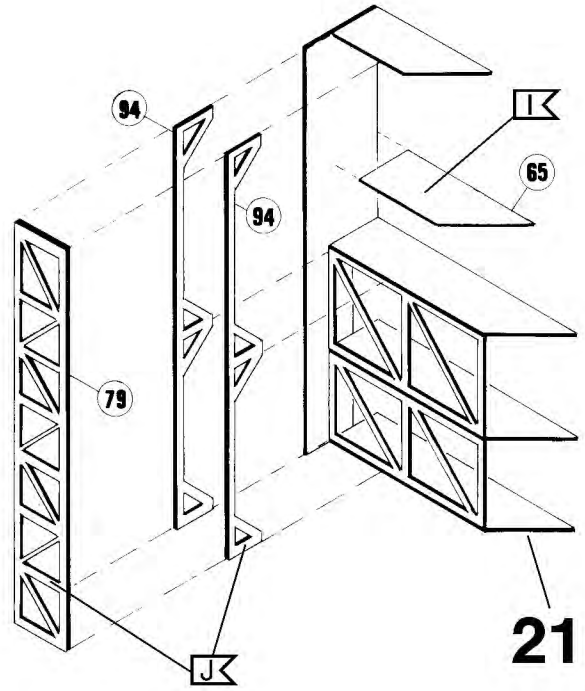
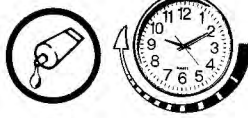
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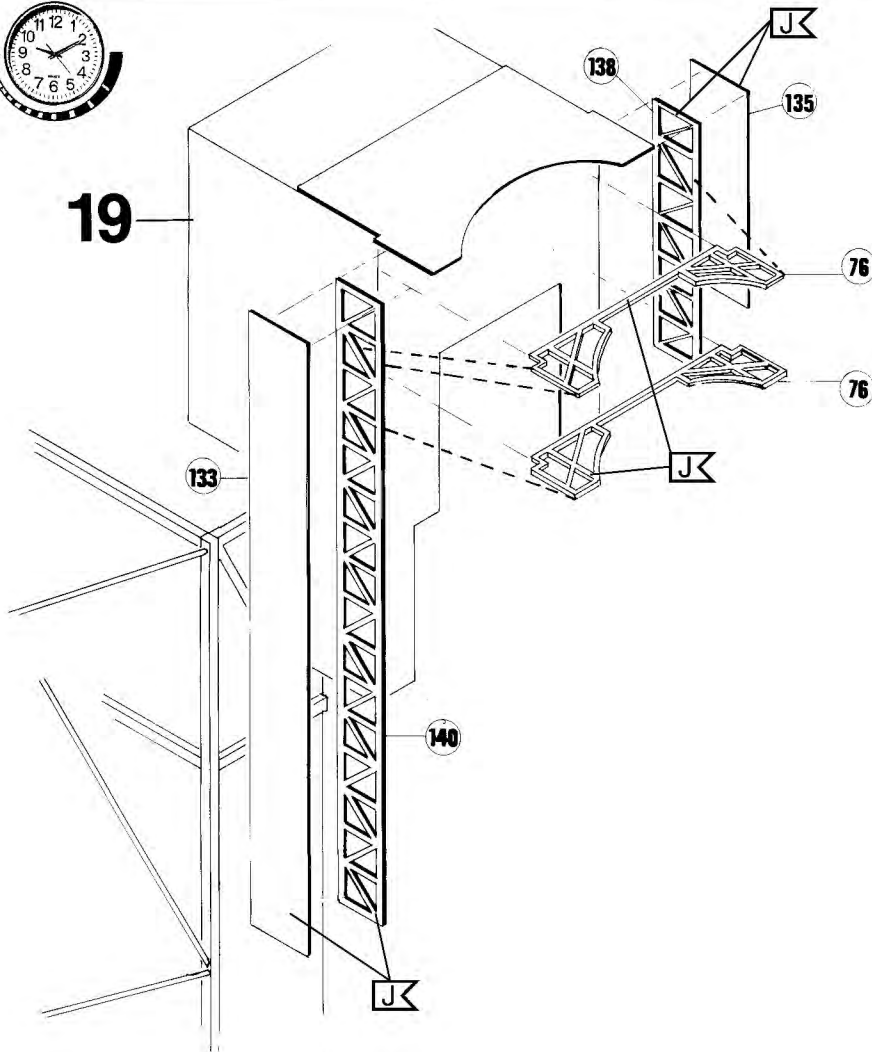
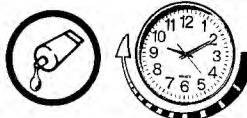
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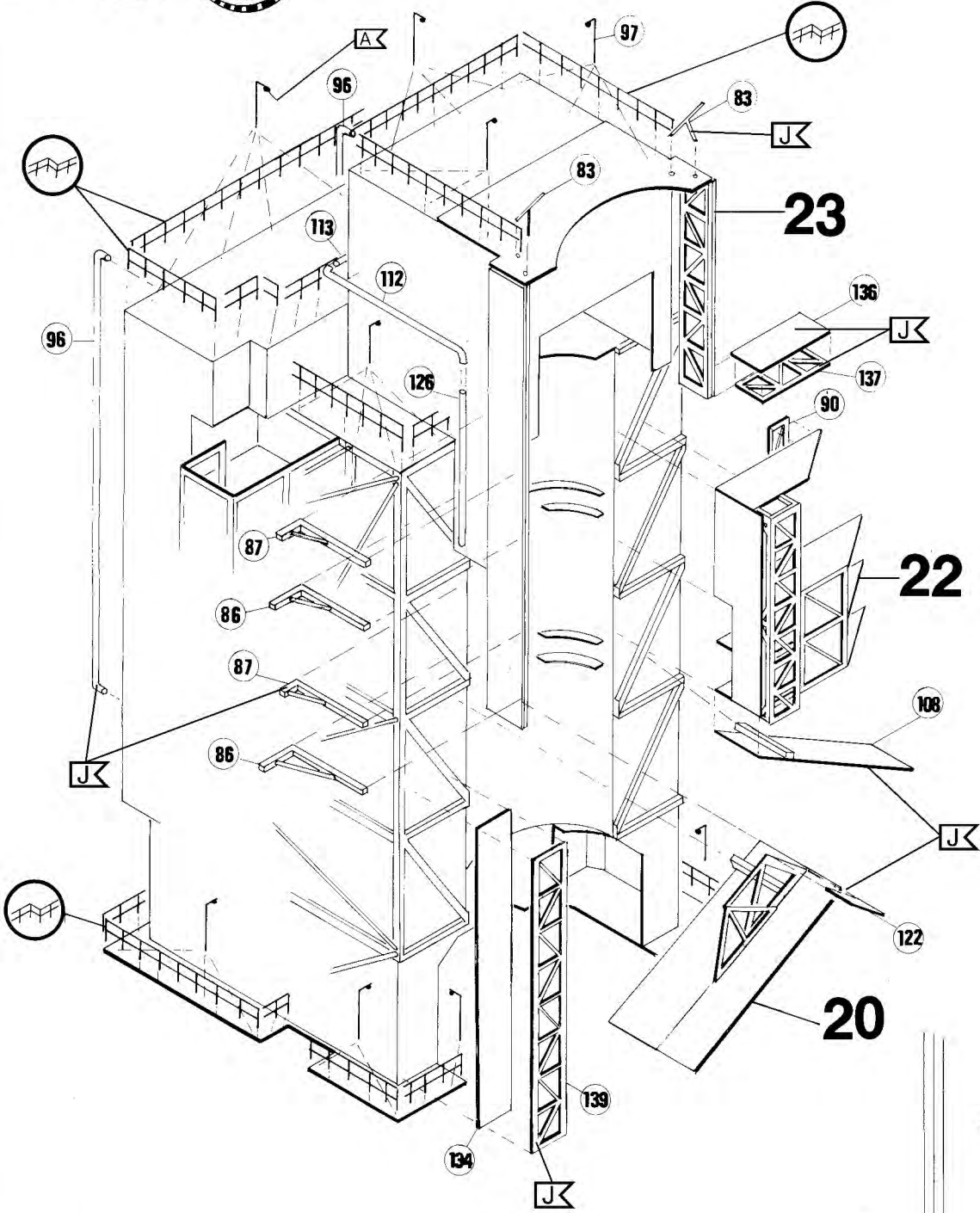
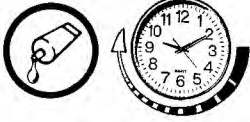
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23



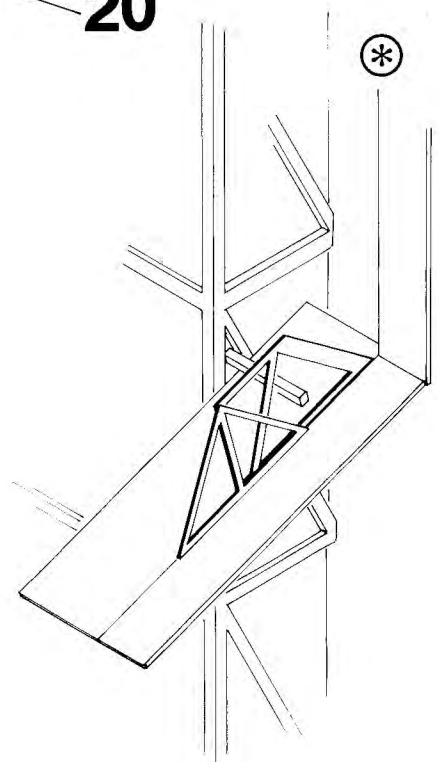
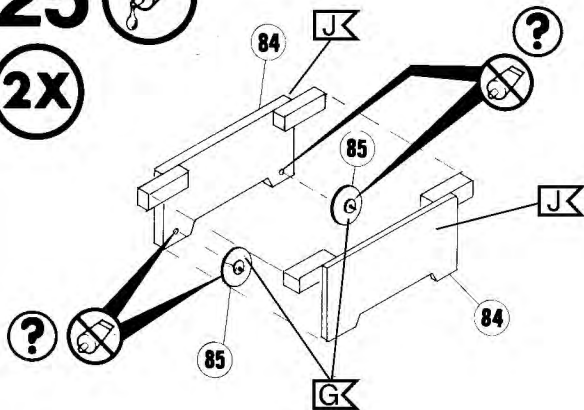
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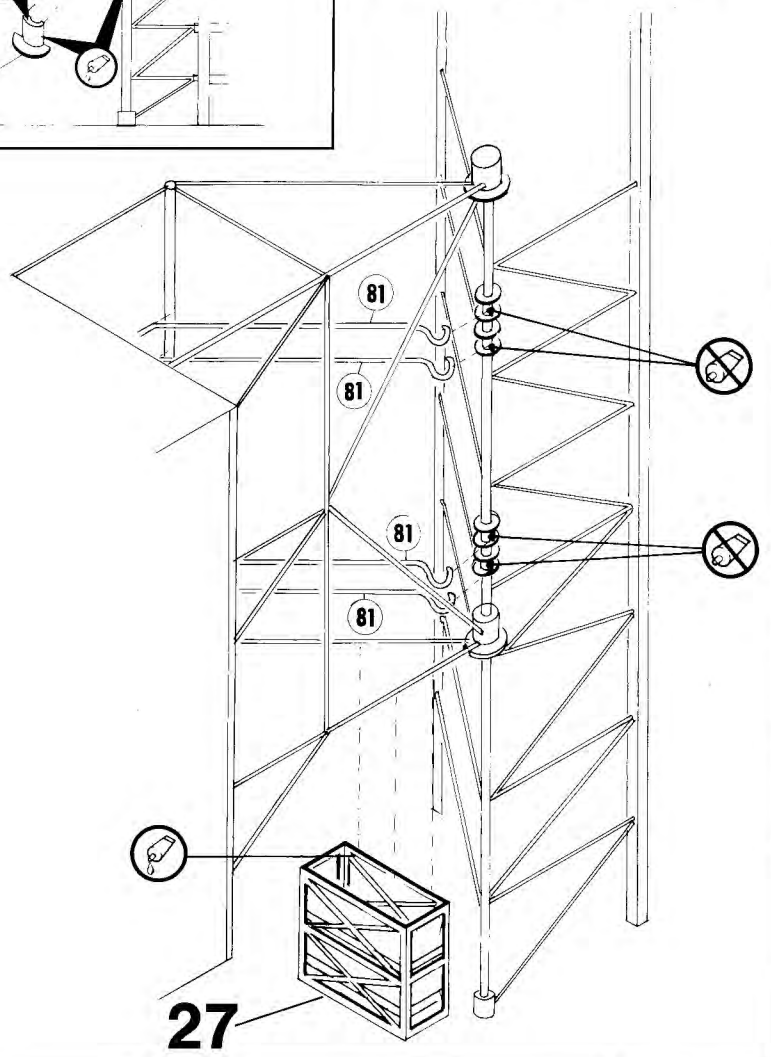
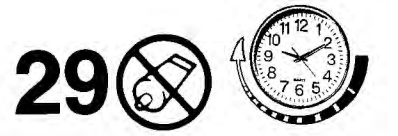
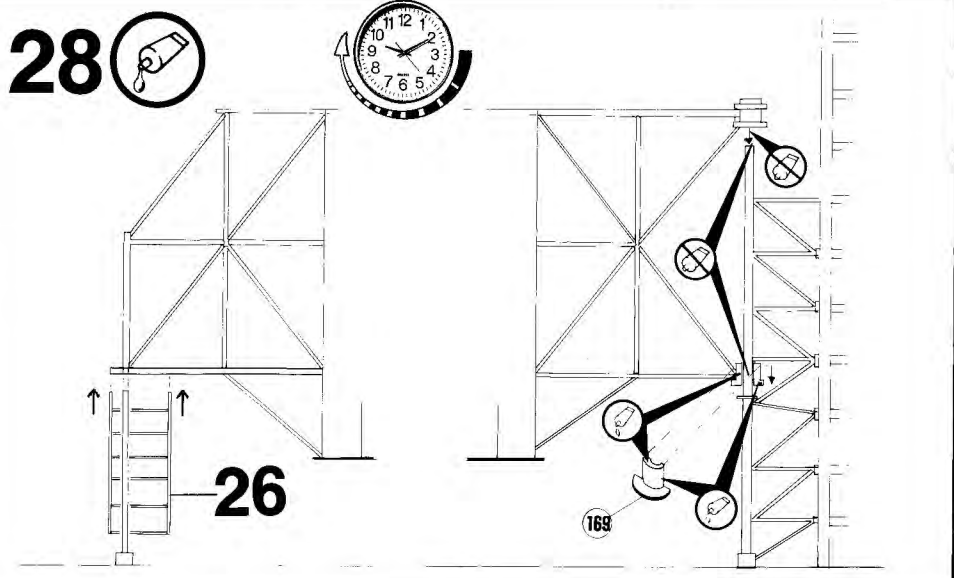
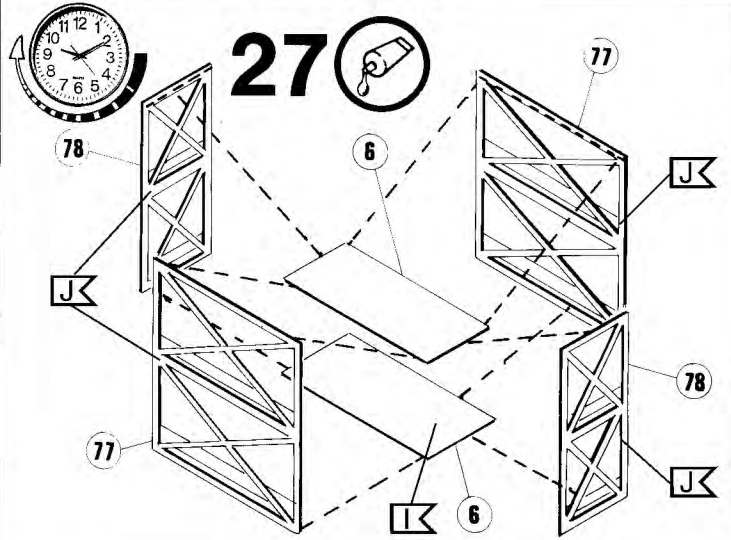
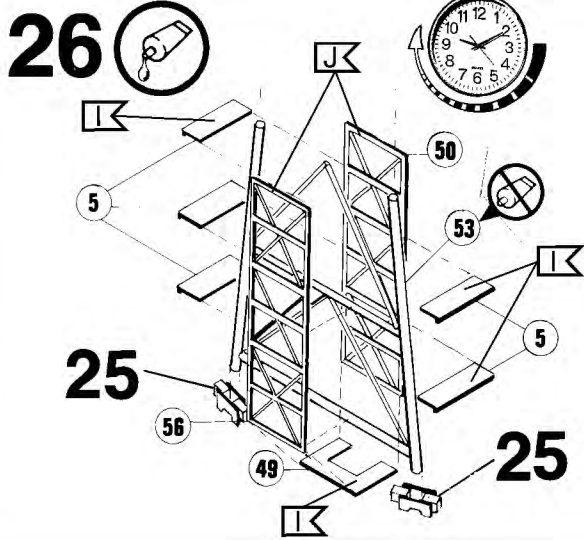


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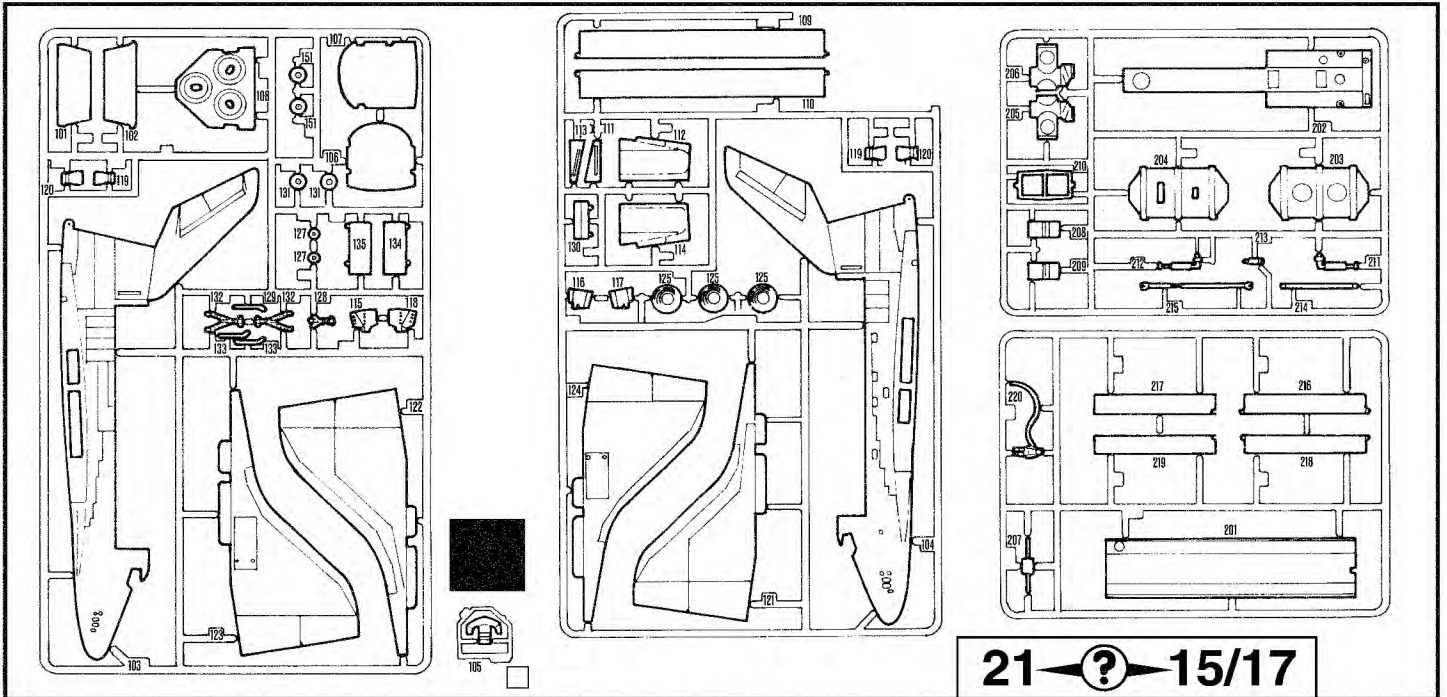


2X

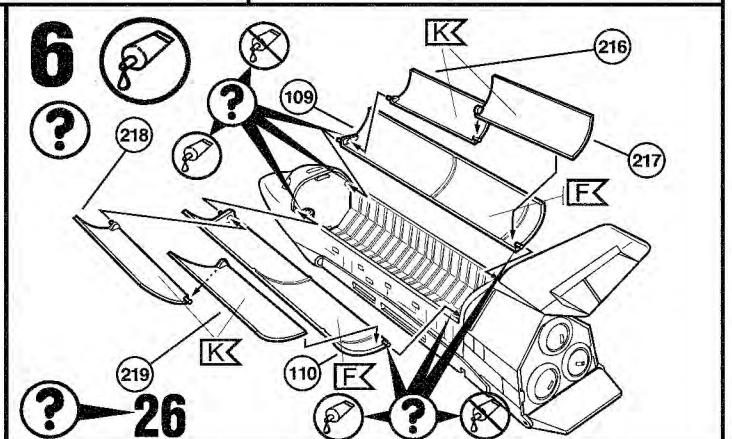
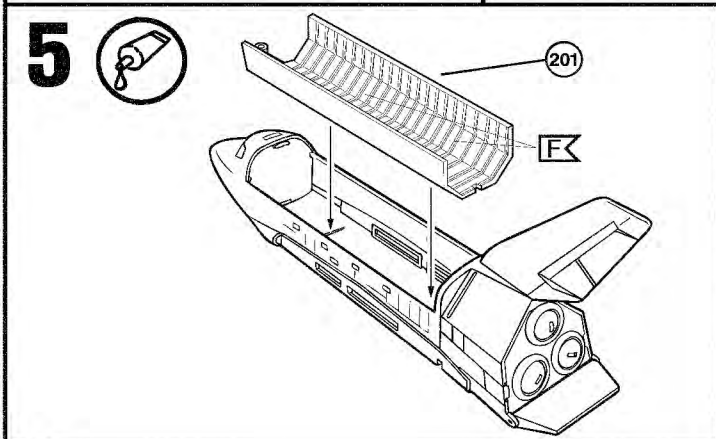
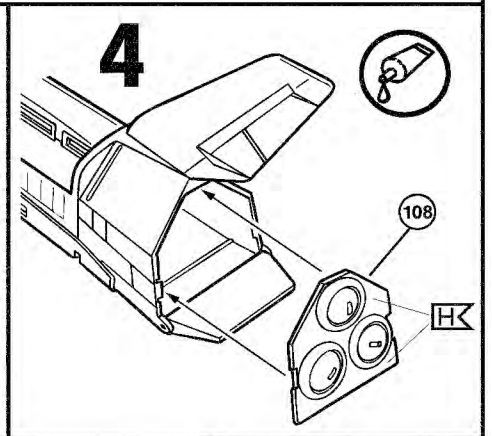
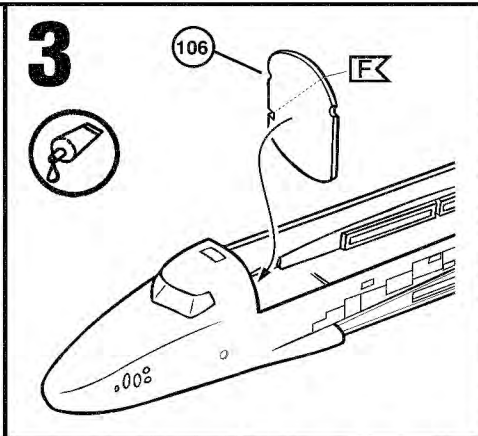
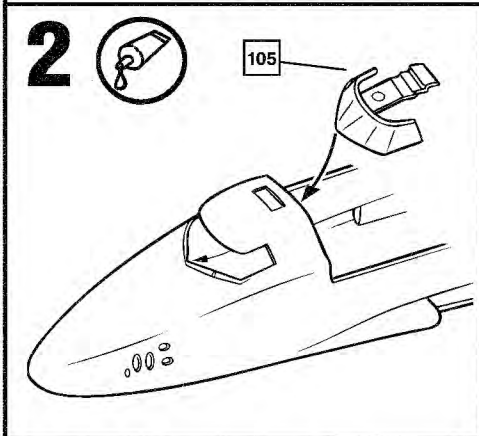
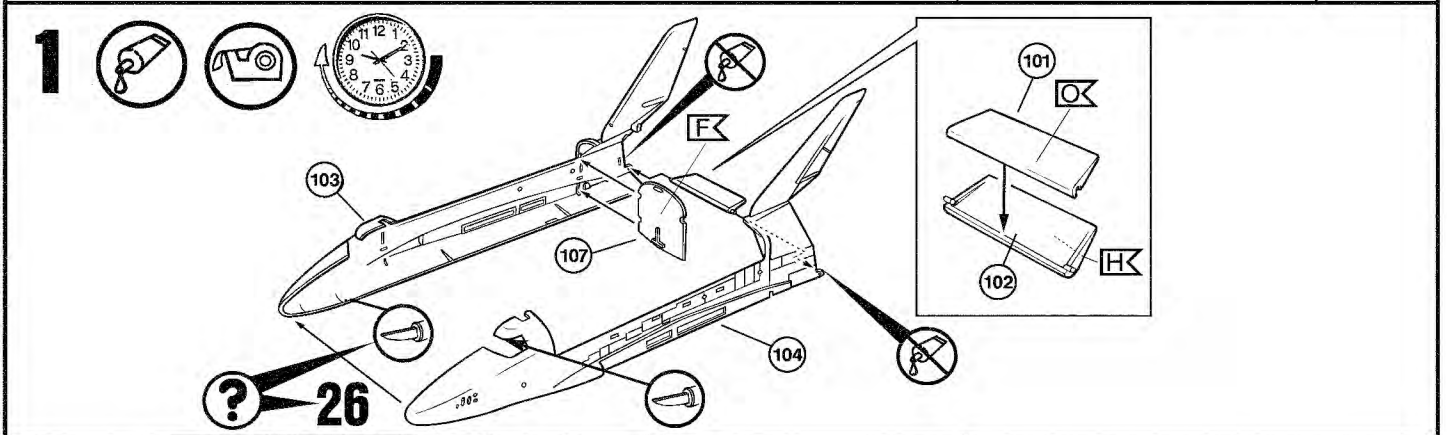


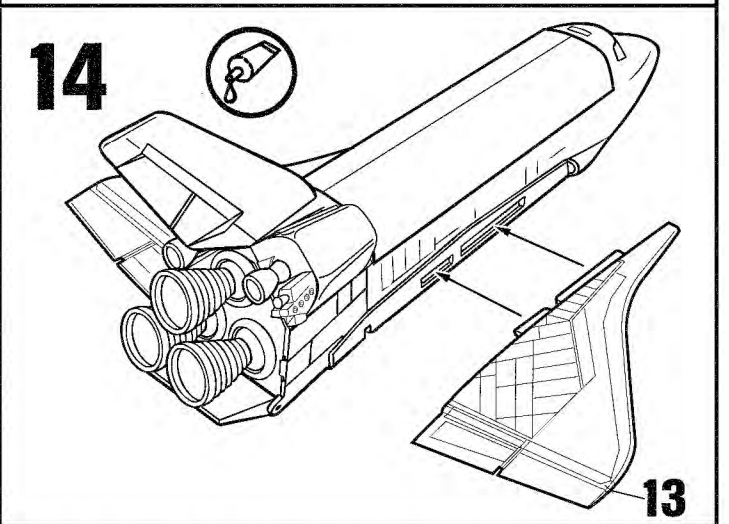
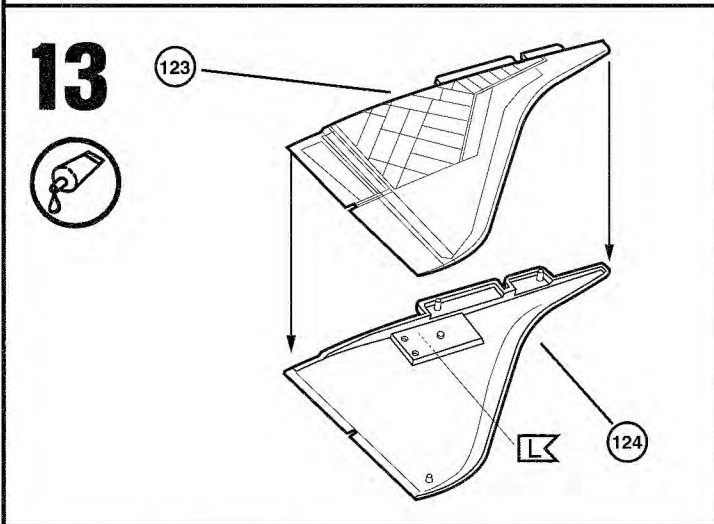
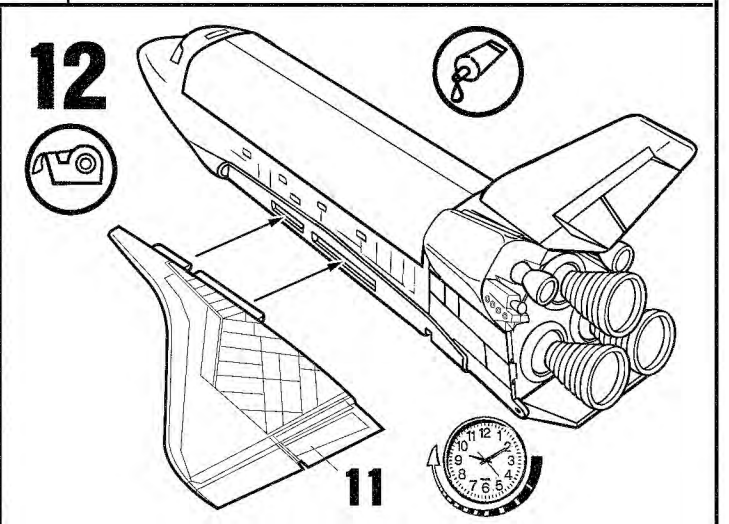
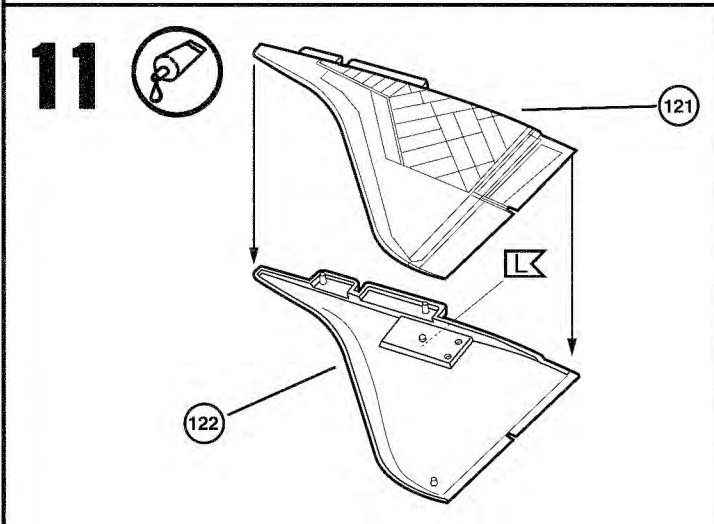
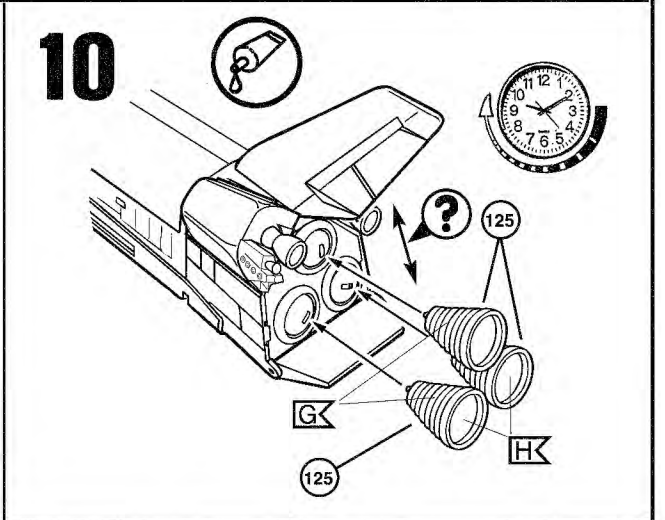
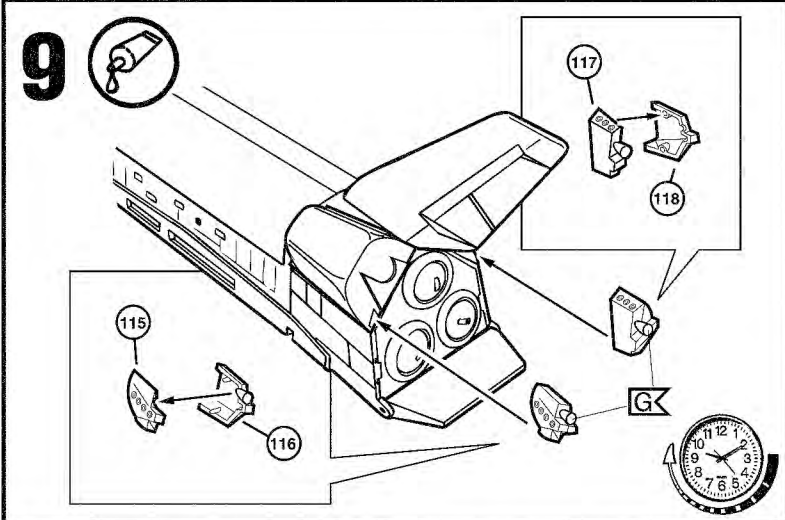
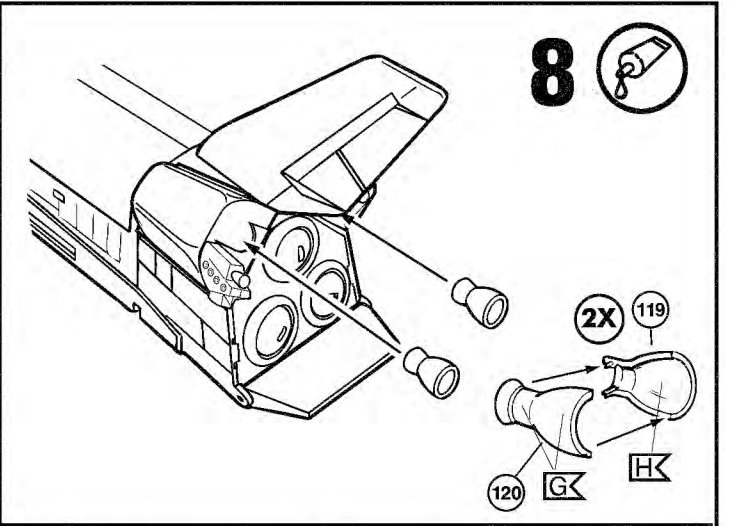
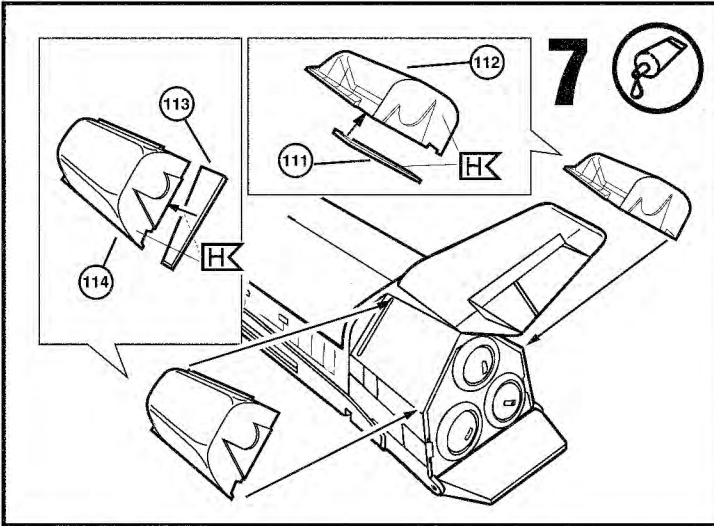


Space Shuttle & Booster Rockets



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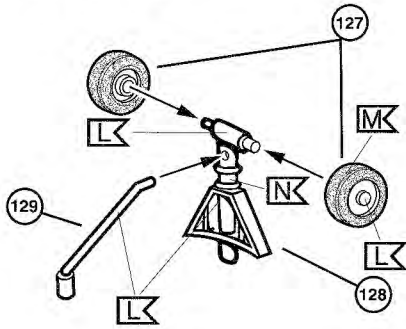




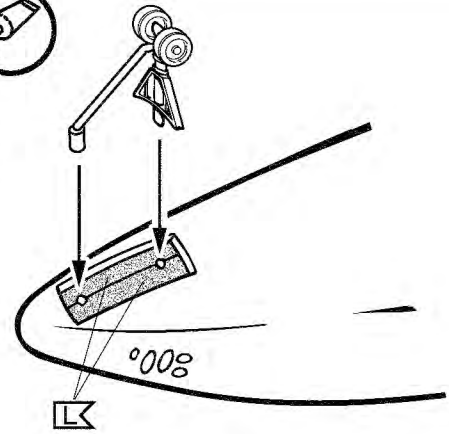
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21/26



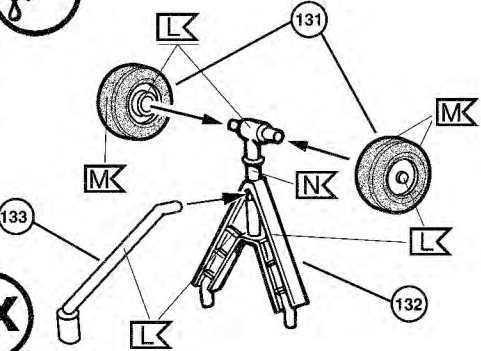
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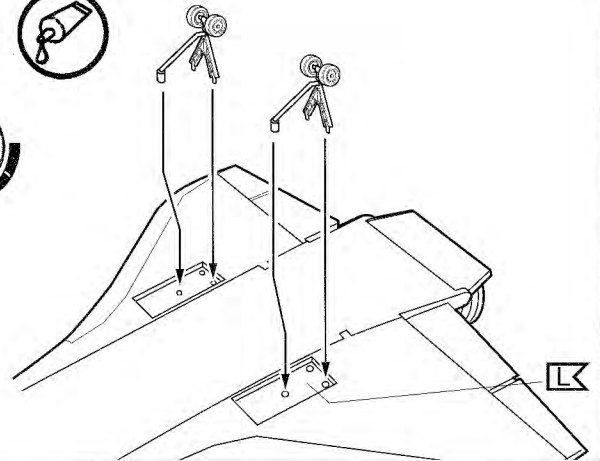
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21/26



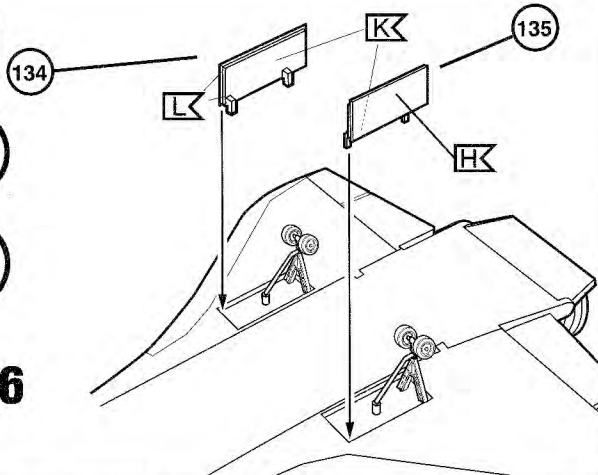
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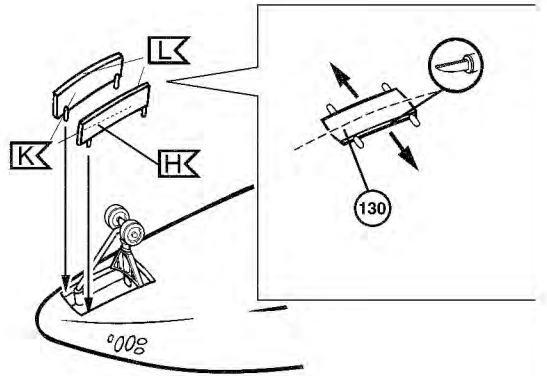
21/26



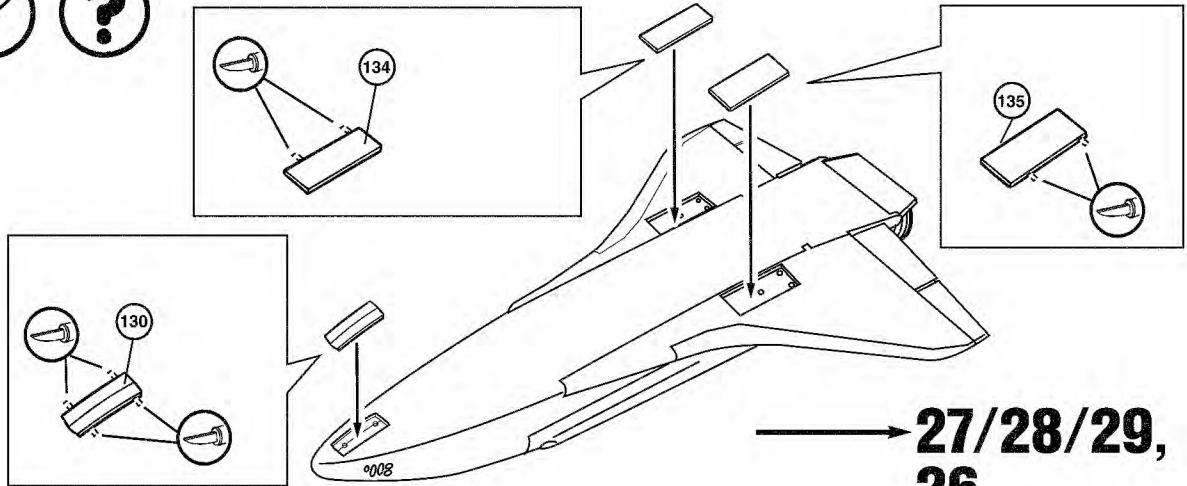
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21



21

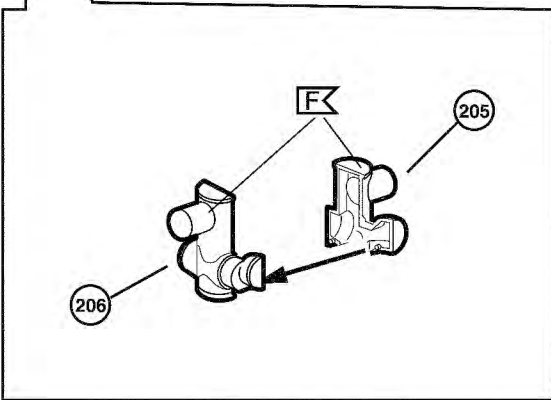
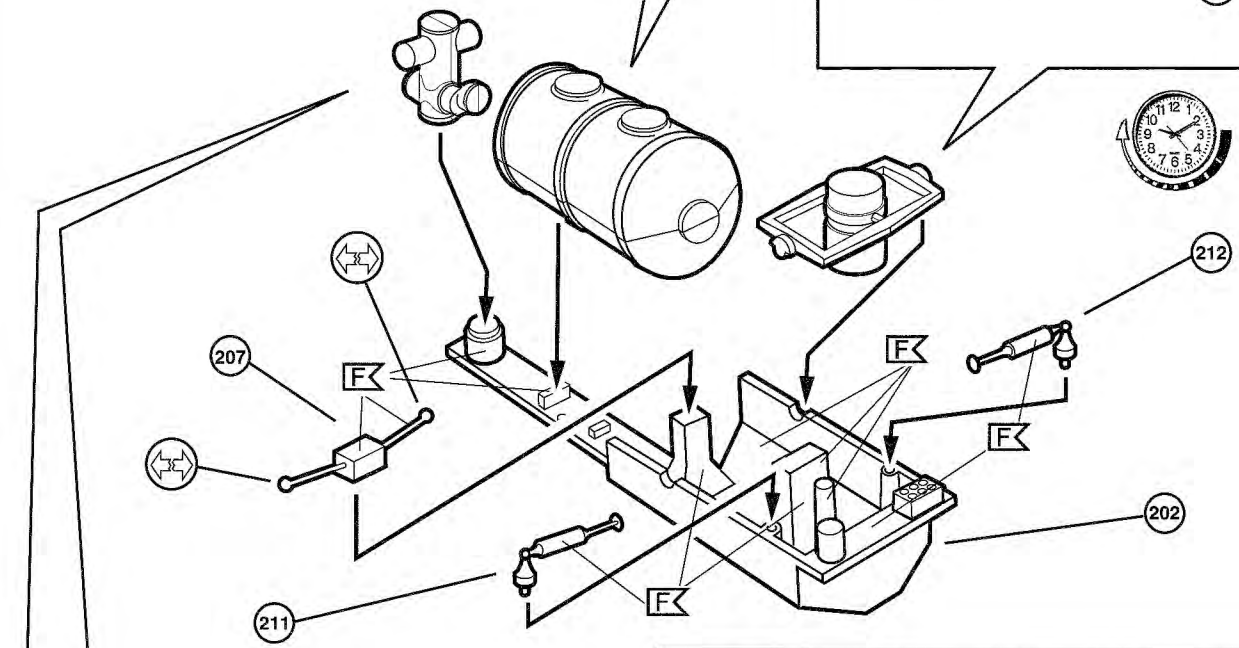
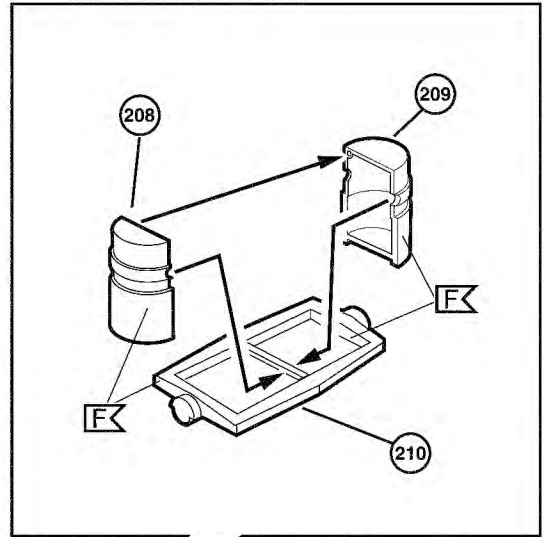
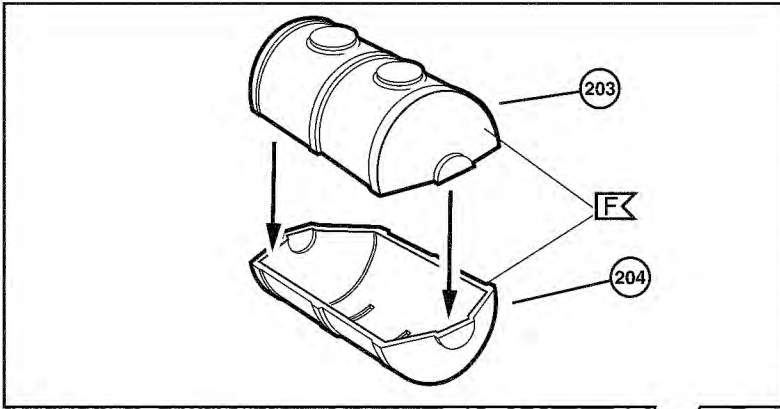


→ 27/28/29, 26

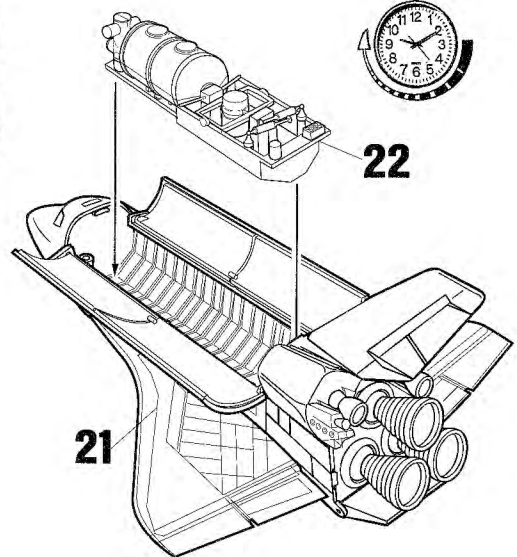
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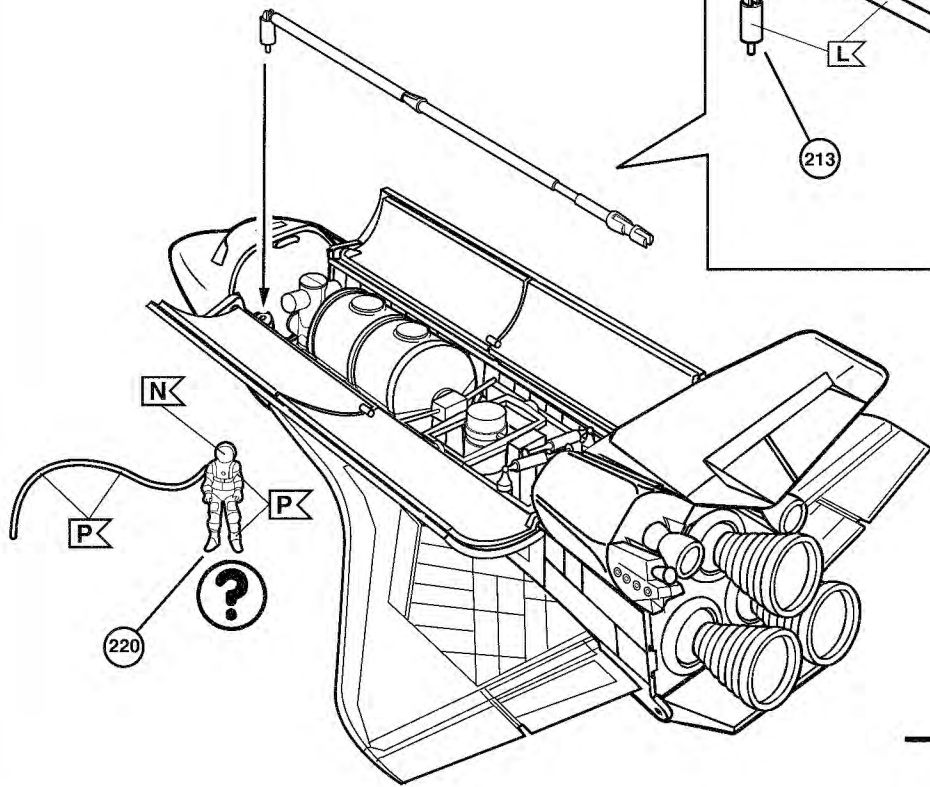
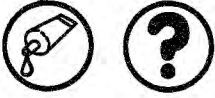
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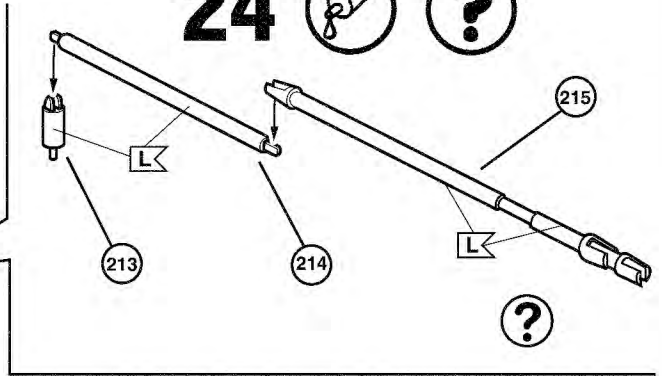
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24

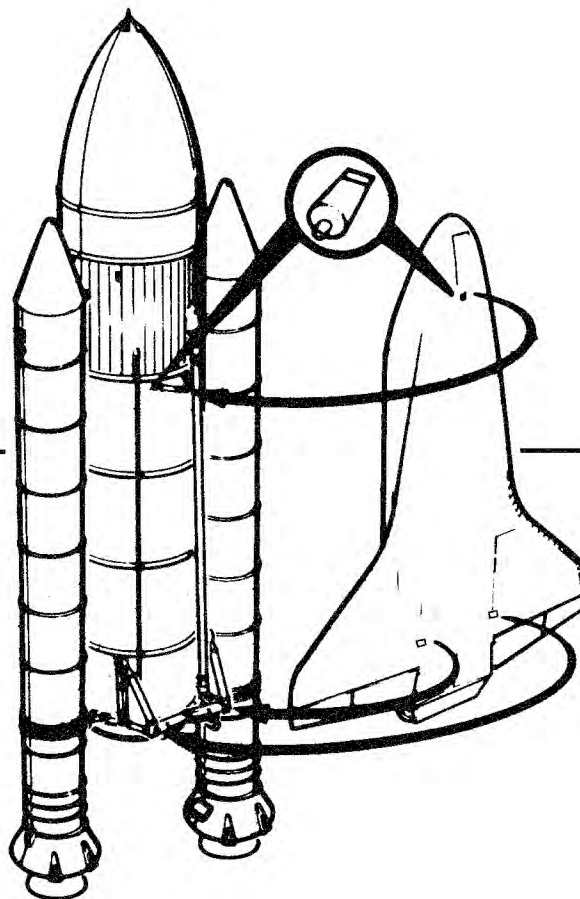


→ 27/28/29

26

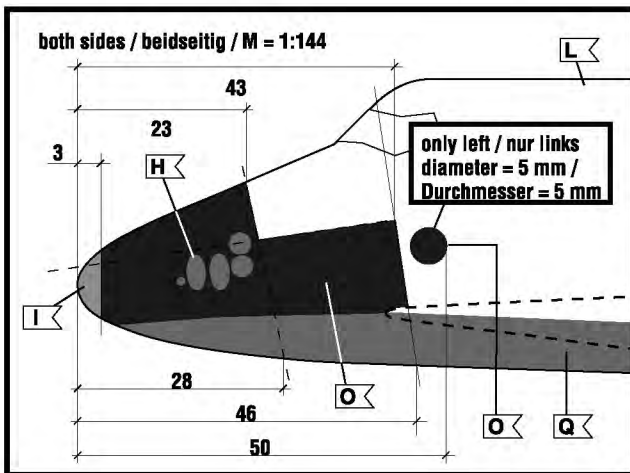
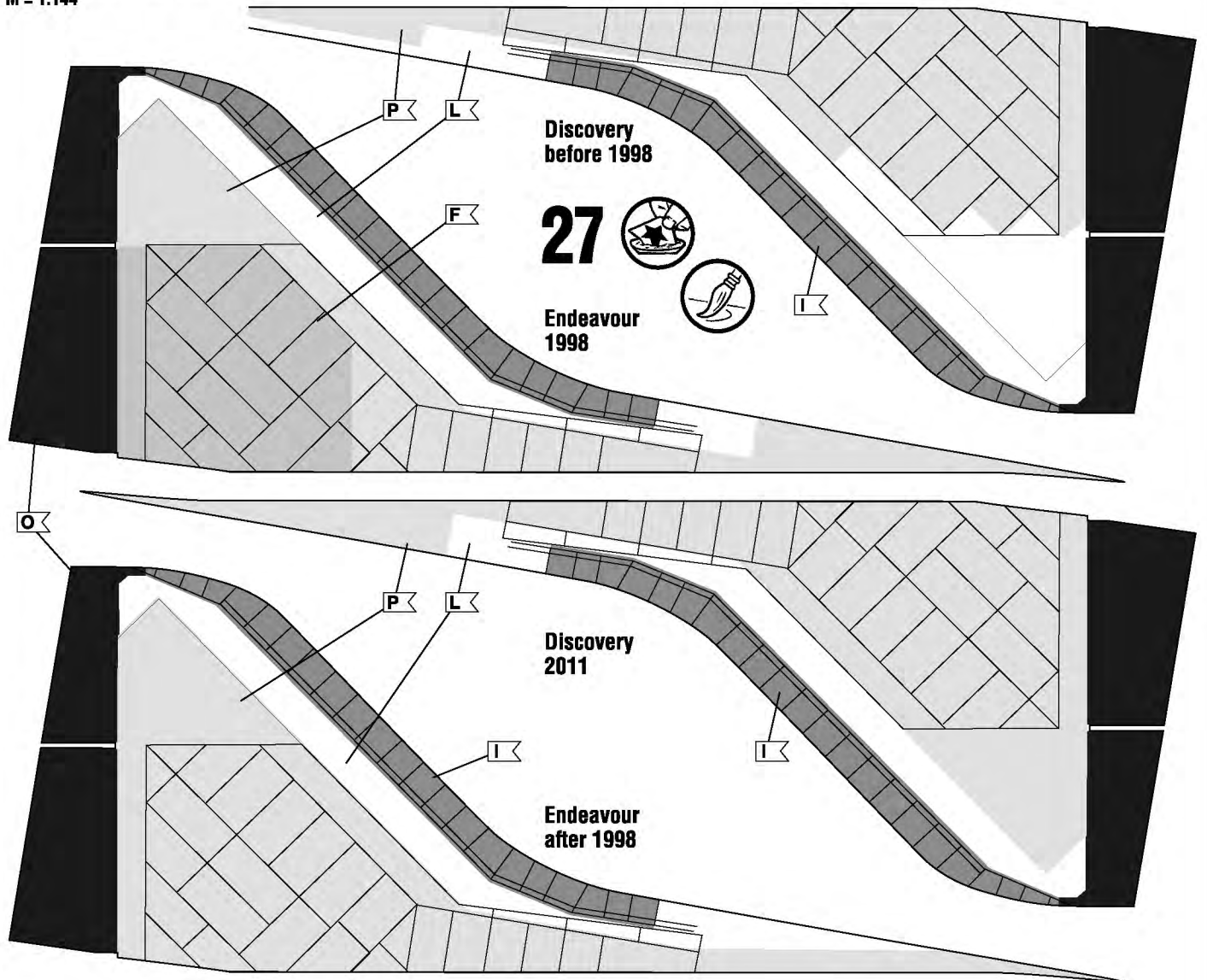


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(page 29)



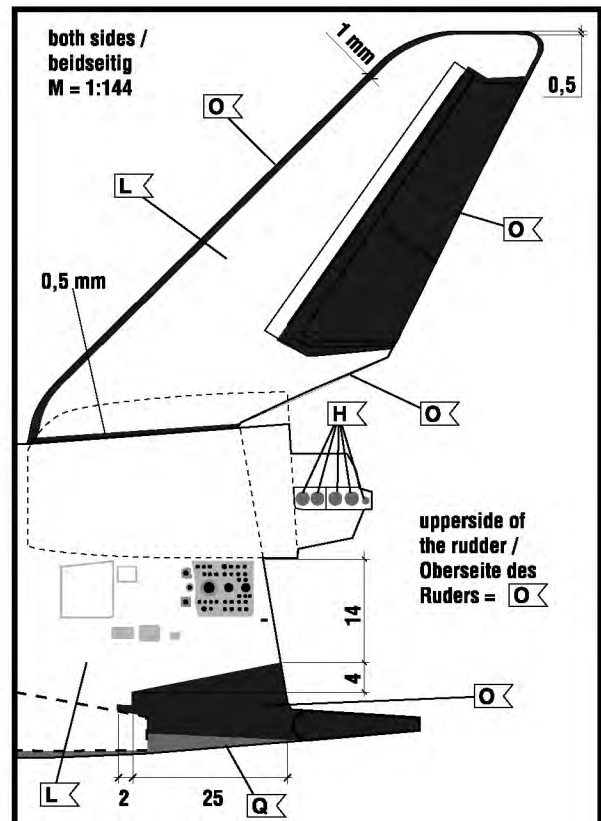
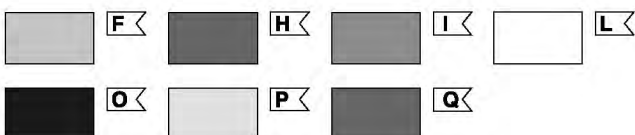
21

both wings / beide Tragflächen
M = 1:144



please note for the fuselage:
work all borders from colour H to O with a soft transition.

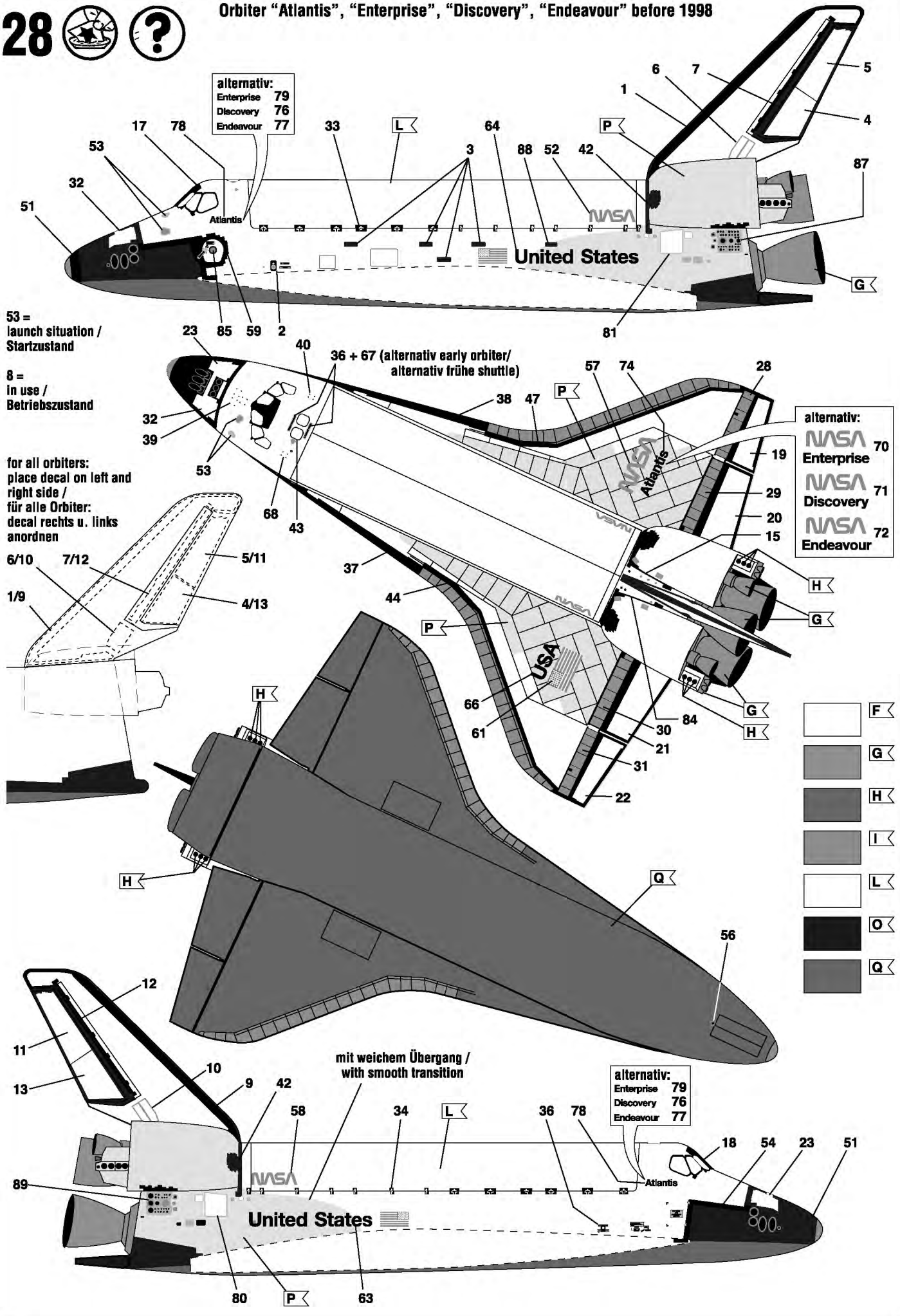
Beachte bei der Farbgebung des Rumpfes den weichen Übergang von Farbe H zu O.



28



Orbiter "Atlantis", "Enterprise", "Discovery", "Endeavour" before 1998



alternativ:
Enterprise 79
Discovery 76
Endeavour 77

alternativ:
NASA 70
Enterprise 71
Discovery 72
Endeavour 73

53 = launch situation / Startzustand
8 = in use / Betriebszustand

for all orbiters:
place decal on left and right side / für alle Orbiter:
decal rechts u. links anordnen

mit weichem Übergang / with smooth transition

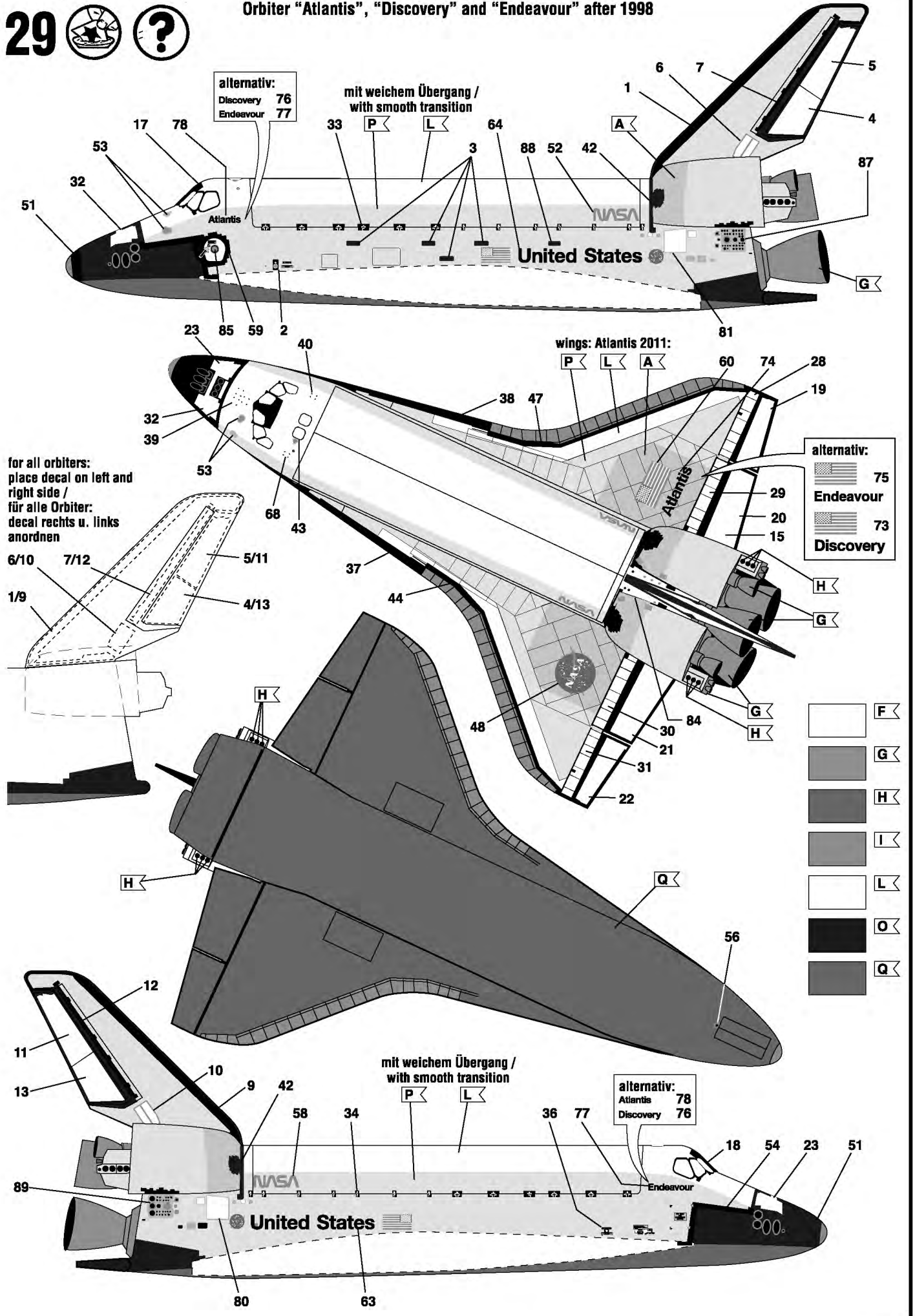
alternativ:
Enterprise 79
Discovery 76
Endeavour 77

- F
- G
- H
- I
- L
- O
- Q

29



Orbiter "Atlantis", "Discovery" and "Endeavour" after 1998










alternativ:
Discovery 76
Endeavour 77

mit weichem Übergang /
with smooth transition

for all orbiters:
place decal on left and
right side /
für alle Orbiter:
decal rechts u. links
anordnen

wings: Atlantis 2011:

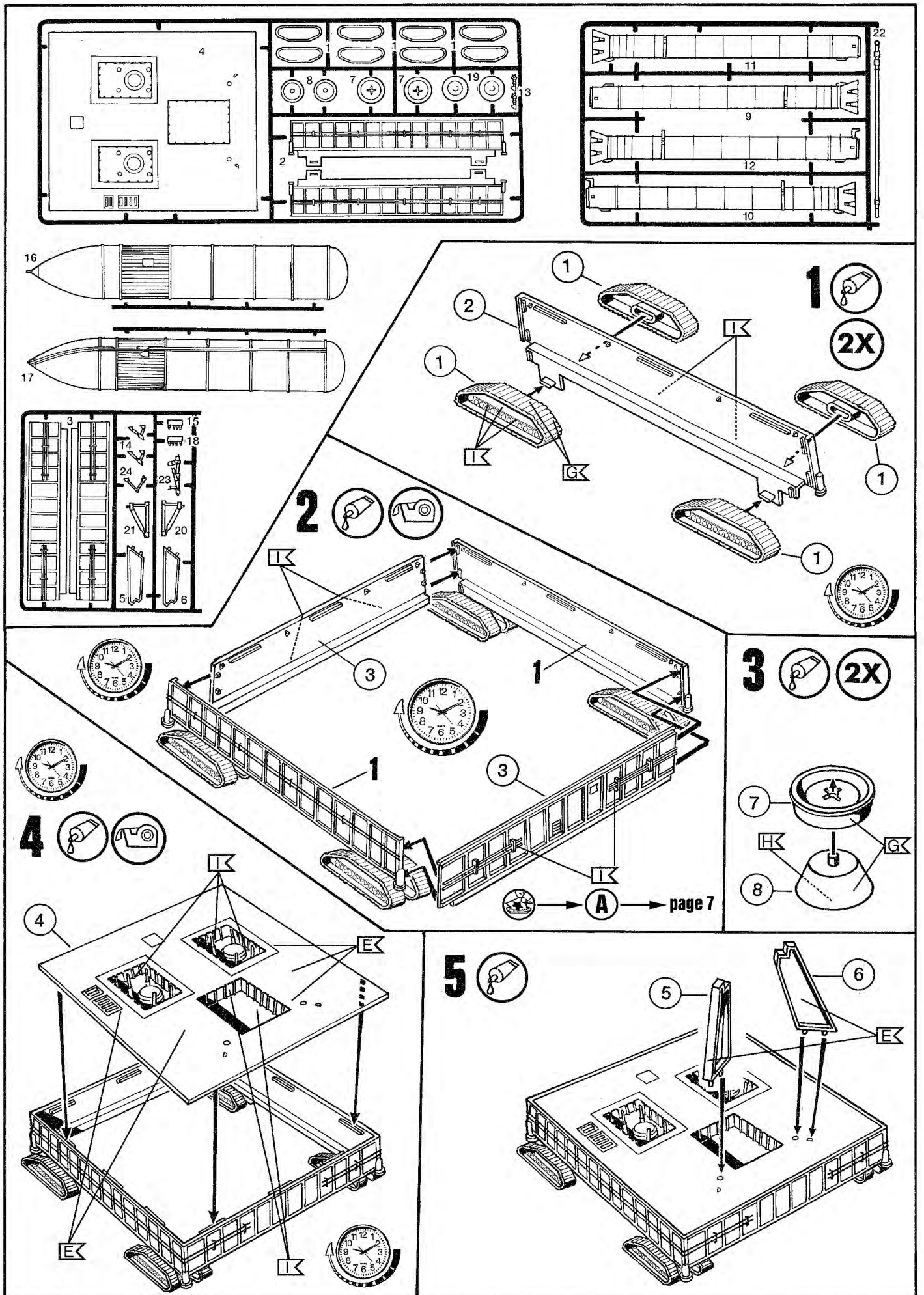
alternativ:
75
Endeavour
73
Discovery

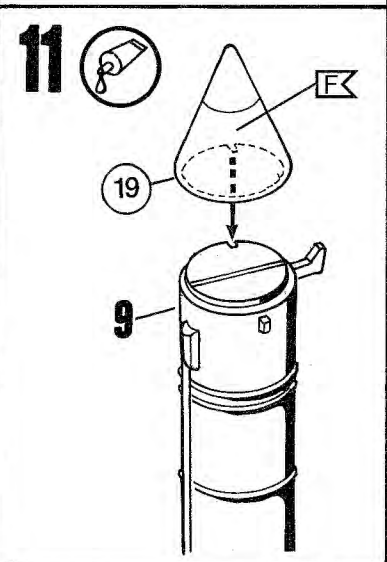
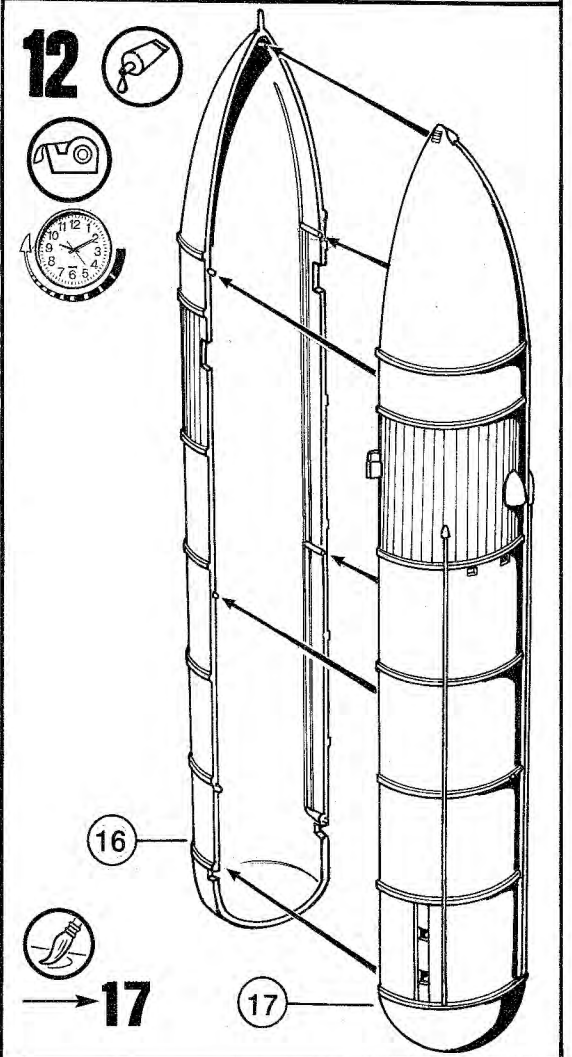
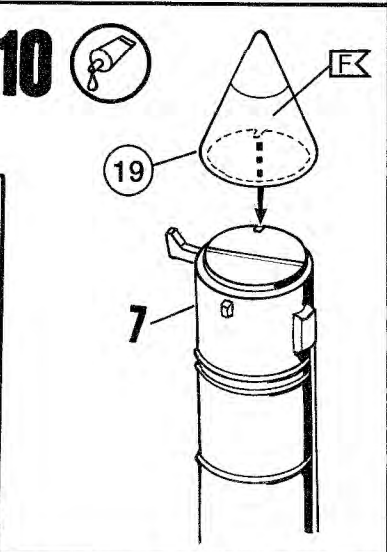
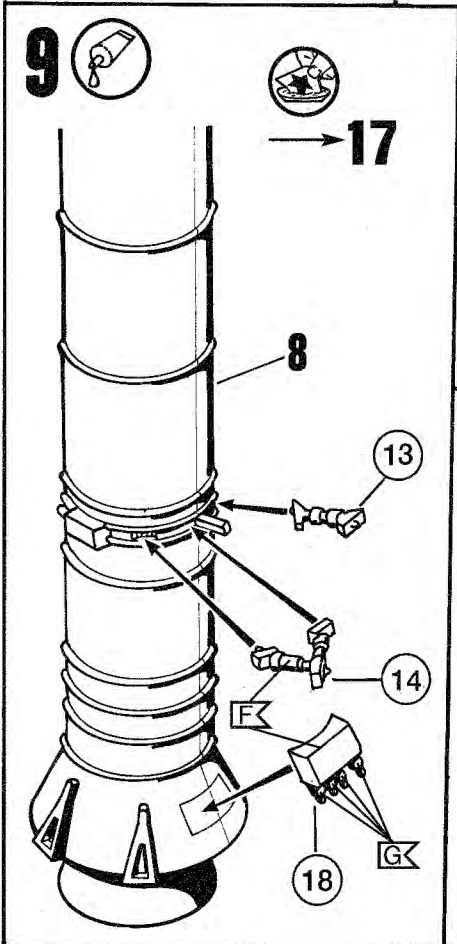
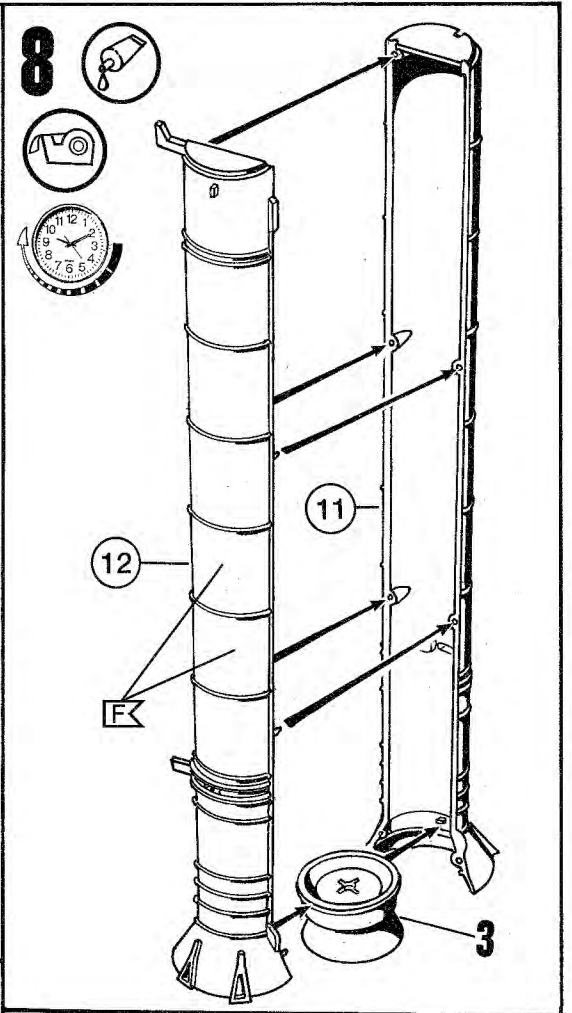
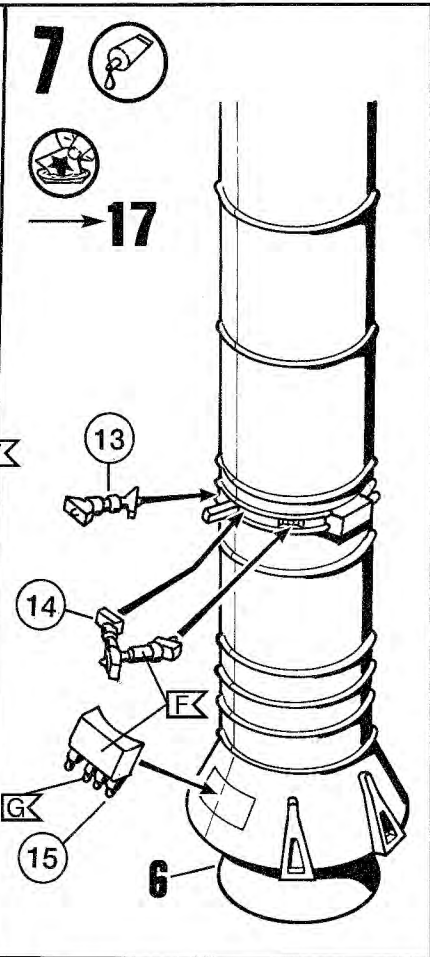
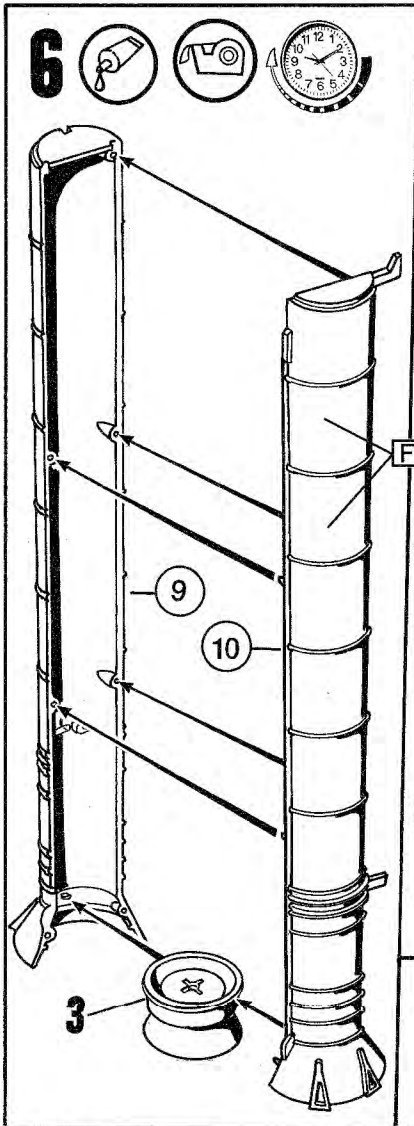
-  F
-  G
-  H
-  I
-  L
-  O
-  Q

mit weichem Übergang /
with smooth transition

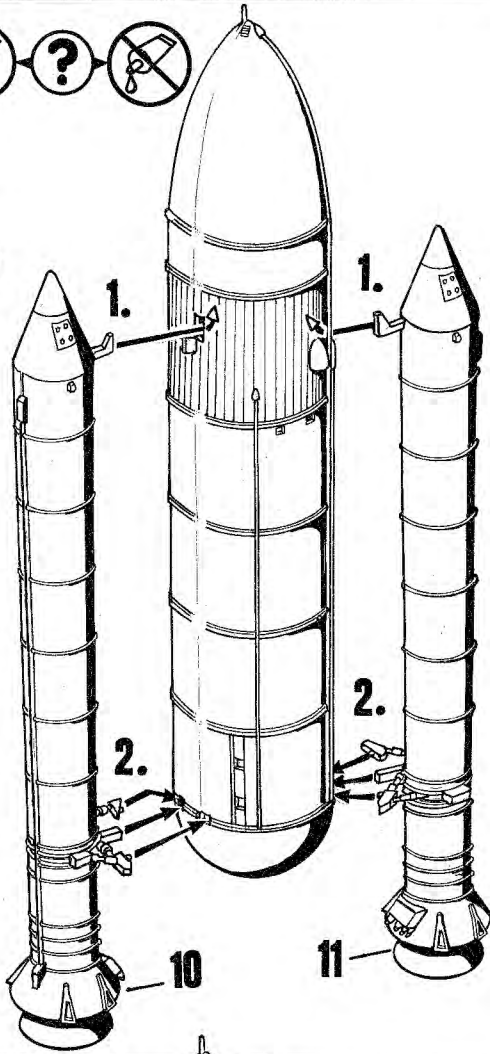
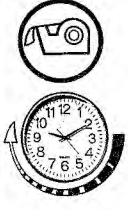
alternativ:
Atlantis 78
Discovery 76

Booster Rockets

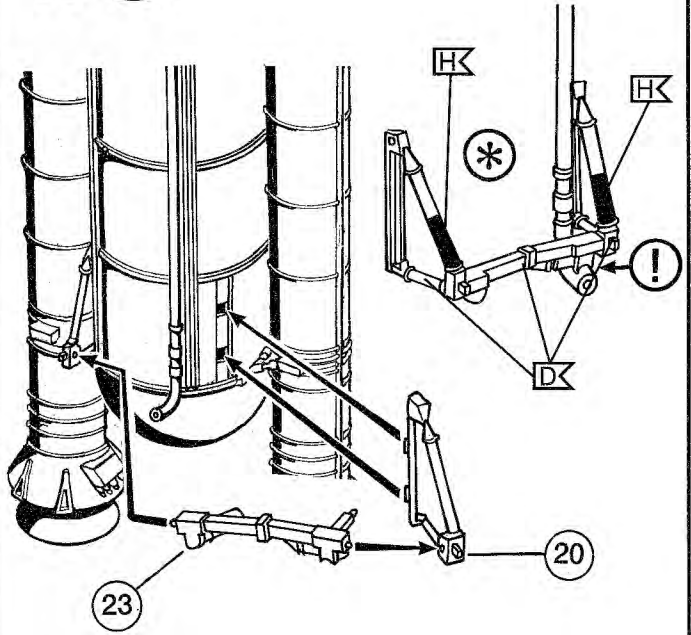




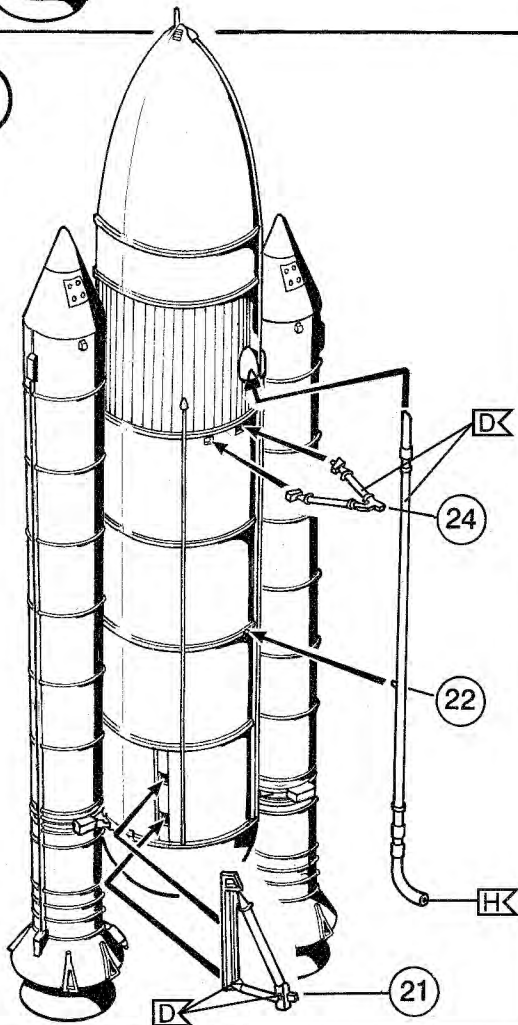
13



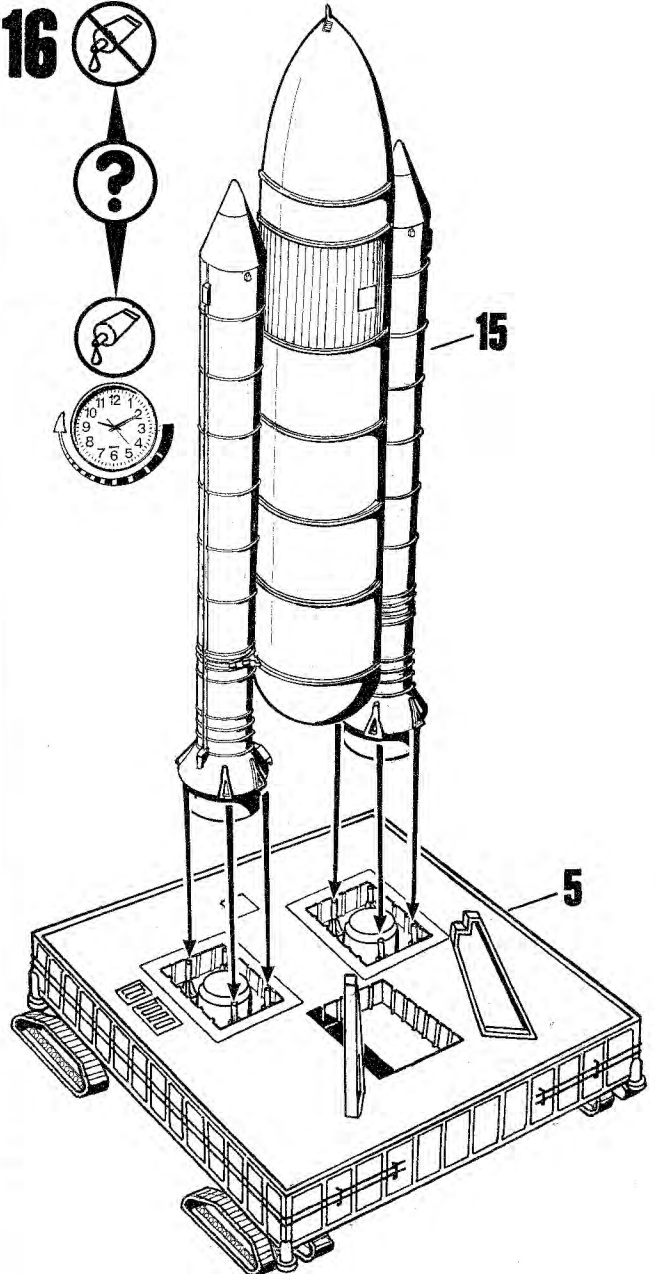
15



14



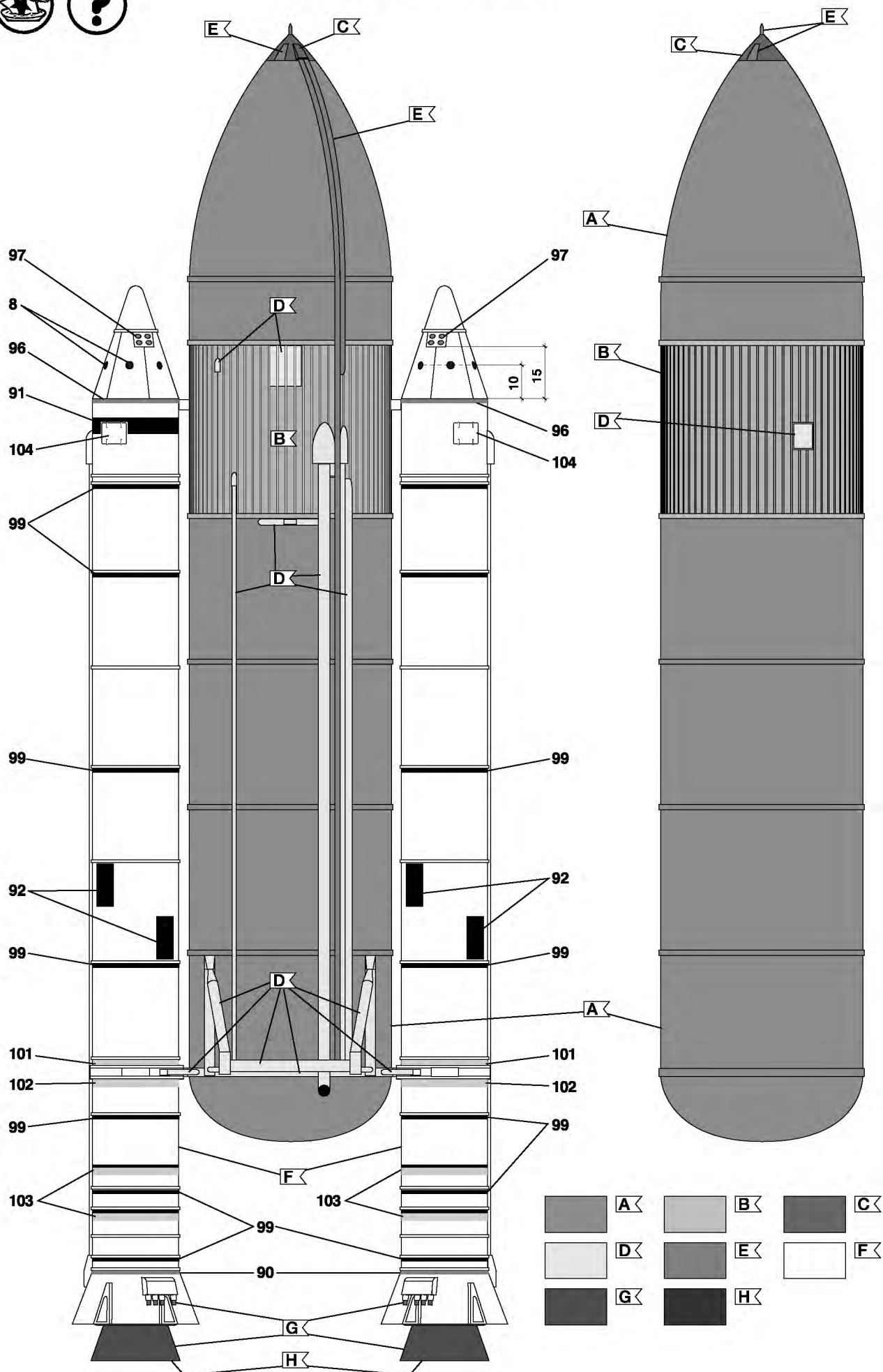
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17



Main Tank and Solid Rocket Booster





Fixed Service Structure and Rotating Service Structure

