



MASCHINENFABRIK

MFG: HUSS-HEINER, WILHIEM, CO.  
NAME: MAGIC

OPERATING INSTRUCTIONS  
for  
Carrousel "MAGIC", Maker's No.  
Road Model

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RESPONSIBILITY OF MANAGERS AND OPERATORS

The following remarks are a compulsory condition for the safe operation of the ride:

1. In all cases the manager is ultimately responsible for the safety of passengers during operation of the ride.
2. Selection of operators must correspond to the demands made on them regarding operation of the ride.
3. The operator must devote his undivided attention to the operation of the ride.
4. He must be acquainted with the functioning of the ride, its safety devices, emergency devices, operating instructions and regulations, and ensure the safety of passengers and safe running of the ride.
5. He must have complete and safe control over the unloaded ride before he operates it with passengers.
6. If a malfunctioning occurs operation must cease immediately.
7. Malfunctioning may often be detected by a change in noise during operation. If this occurs, one should look for the cause and, if necessary, get in touch with experts to find the reason for any malfunctioning.
8. The operator must insist on maintenance work being carried out, as it is described in detail in the operating instructions. If he does not, he is obliged to cease operation.
9. Before initiation the operator has to check the ride on its perfect working condition by performing the ordered controls and the trial runs.
10. The carrying parts as well as the motor driven parts are to be checked on perfect working condition before each initiation. Damaged parts are to be substituted by perfect ones. Furthermore it has to be observed that the ride is in safe upright position during erection and dismantling. After erection all parts have to be orderly connected and all connecting parts and necessary anchorages have to be mounted in a safe way.
11. The complete operating instructions provided by the manufacturer have to be kept at hand in the operator's stand so that the operator can have a look at them at any time. Upon loss, the manufacturer has to be immediately requested to provide a new copy of the complete operating instructions.
12. During repair and maintenance works, the ride must be currentless, i.e. the main switch in the switch cabinet must be switched off. Should it be necessary to carry out maintenance work while the ride is in operation, an additional person to control the switch board is required.



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13. When carrying out repairs involving welding work it is essential to make sure that the welding current does not flow through bearings or other sensitive parts; in other words, the ground electrode must always be fitted close to the point of welding.

Welding repairs may only be carried out by properly approved specialist companies.

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## II. Erection and Dismantling

- 1) Run the center structure (1) onto the center point so that the front axle lies in the access area.
- 2) Fix the rear axle in position with chocks.
- 3) Connect up the electric cabling for the erection aggregate (2).
- 4) Underpin the four hydraulic cylinders (3) with stable underlays. Raise the center structure evenly until the some of the weight is taken off the transport chassis.
- 5) Take the stabilizers (4) from the rear transport chassis (5) and bolt onto the center structure. Underpin the two stabilizers with blocks/boards.
- 6) Release all transport belts (75)!
- 7) Release and remove the pressure rods from the rear transport securing element (6). Remove the spacers (7) that held the booms together. Remove the crossbars and fold down the transport securing element.
- 8) Remove the two frames (19) between the booms and the lifting rods (20).
- 9) Fit the two hydraulic hoses to the erection cylinder (8) by means of the quick-action coupling.

### **Important!**

The hoses must be unpressurized when they are coupled up, as otherwise this would block the coupling valve.

- 10) Undo and remove the pin (9) from the bracing strut(10) .
- 11) Now switch on the hydraulics and swing the boom (11) into the right position (for the pin (12) to be inserted). If the boom does not swing any further just before it reaches the end position, support the erection cylinder by pressing against the gondola boom (13).
- 12) Insert the pin (12) to secure the boom. To reduce wear, first smear the bolts with graphite grease.



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- 13) However, the pin has not yet settled completely into its final bearing.
- 14) Disconnect the hoses from the erection cylinder (8) and connect them to the pin fitting cylinder.
- 15) Fit the pin fitting cylinder over the pin (12) and fasten onto the central rotating structure with two angle pins.
- 16) Connect pin (12) to the pin fitting cylinder using a pin.
- 17) Switch on the hydraulics and press the pin (12) into its final position.  
If the pin refuses to slide into its final position, attach the eye (14) on the boom to a crane and move the boom.
- 18) Remove the pin fitting cylinder.
- 19) Fit pin (9) in position on the central rotating structure by inserting the angle pins and secure with a spring ring.
- 20) Fasten the bracing strut (10) on the central rotating structure, insert the angle pins and secure with a spring ring.
- 21) Repeat Points 9 - 20 to fit the second boom.
- 22) Release and remove the pressure rods from the front transport securing element (15). Remove the spacers (7) that held the booms together. Remove the crossbars and fold down the transport securing element.
- 23) Fit the other two booms by the procedure described under Points 9 - 21.
- 24) Remove the bottom part (17) of the clown figure from the front transport chassis, set it on the corresponding mount provided on the central rotating structure, pin fast and lock with spring rings.
- 25) Insert the decorative mirror globe into the socket in the top part (18) of the clown figure and tighten the pressure screw provided.
- 26) Take the load crossbar with the rope tackle, remove the top part of the clown figure from the rear transport chassis, insert it into the bottom part of the clown figure and fasten with the pin and screw!



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- 27) Connect up the electric cabling for the clown figure.
- 28) Remove the rotation locks (21) of the ring-shaped lifting rod bearers (22).
- 29) Fit the crane tackle onto the lug (23), lift the swinging arm (24) and swing the lifting rod (20) towards the lifting rod bearer until the pin (68) can be fitted.
- 30) Fit the bolt (69) with washer.

Tightening torque of the bolt = 1177 Nm  
(868 ft lb)

- 31) Secure the bolt (69) with a spring ring.
- 32) Fit the other lifting rods.

- 33) Open the ball cock (41) on the lifting cylinder (42).
- 34) It is absolutely essential to insert the emergency stops (43) into each of the boom brackets. i.e. each emergency stop mark must be identical to the boom marking.
- Insert the pin and secure with a spring ring.

#### Transport Chassis

- 35) Take the electric cables from the front transport chassis.
- 35A) The settings for the transport chassis valves may be seen from the Operating Instructions from BUNGE.
- 36) Disconnect the hydraulic, pneumatic and electrical connections between the transport chassis and the center structure.
- 37) Using the four hydraulic cylinders (3), raise the center structure until the some of the weight is taken off the mount on the front transport chassis (26).
- 38) Pull out the two side pins (27) on the front transport chassis right up to the stop.



- 39) Run the front transport chassis away from the center structure.
- 40) Push the car protection barrier (28) into the rear transport chassis, pin and secure.
- 41) Built into the rear transport chassis is a forked draw-bar ( 29 ) for shunting.
- 42) Pull out this shunting draw-bar, peg in position with the pins provided and secure.
- 43) Raise the center structure until the weight is taken off the wheels of the rear transport chassis (5).
- 44) Position the pin fitting cylinder over the pin and fasten onto the center structure with two angle pins.
- 45) Connect pin (30) to the pin fitting cylinder using a pin.
- 46) Pull pin (30) with the hydraulic gear out of its bottom bearing.
- 47) Moving the corresponding hydraulic cylinder (3) and the pin fitting cylinder at the same time facilitates pulling the pin out.
- 48) Remove the pin fitting cylinder and pull the pin (30) out of the top bearing.
- 49) Repeat the procedure described under Points 38 - 42 for the second pin.
- 50) Run the transport chassis away.
- 51) If the rear transport chassis cannot be run out backwards due to lack of space, it is possible to swivel it through max. 90° left or right around a pin.

The procedure is as follows:

- A) Take the weight off the transport chassis
- B) Pull out the corresponding pin (i.e. the non-pivot pin).
- C) Raise the center structure until the wheels are no longer touching the ground
- D) Swivel the transport chassis around the second pin (pivot pin).



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- E) Lower the transport chassis and pull out the pin.
- F) Run the transport chassis away.

- 52) Remove the holders (31) between the revolving gondola triads (32) and the gondola triad booms (33).
- 53) Bolt the gondola triads onto the triad booms and secure.
- 54) Remove the securing element (34) from the gondola boom (35).
- 55) Remove the securing element (36) from the swinging arm (24).
- 56) Fold down and remove the rotation lock (37).

#### Center Structure

- 57) Lay out the underpinning boards (38) under the center structure and underpinning boards (39) under the stabilizers (4) exactly in accordance with Drawing 4-23039.
- 58) With the aid of the hydraulic cylinder (3), lower the center structure until its lowest point is min. 50 mm (1.97 inches) above the highest point of the terrain.
- 59) The following points are available for horizontal alignment of the center structure:
  - 1. Crosswise: Behind the maker's nameplate
  - 2. Lengthwise: Above the stabilizer mounting point

#### Gondola Triad Booms

- 60) Remove the transport securing facilities (71) from the revolving gondola triads and swing the booms into the position for operation.
- 61) Prior to assembly, smear the pins (72) with graphite grease to reduce wear.
- 62) Hook the 12 bracing struts (73) into position between the booms, insert the headed pins and secure the headed pins with safety locking pins.



- 63) Lightly oil the adjusting spindles (74) on the bracing struts, tighten them with a torque wrench set to 200 Nm (148 ft lb) and then tighten the locknuts.

#### Gondolas

- 64) With the aid of the load crossbar and the rope tackle, fit the gondolas (40) onto the gondola booms (35).
- 65) Carefully bolt them in position using the two DIN 931 - M20 x 160 - 10.9 bolts (65) and the two DIN 931 - M20 x 260 - 10.9 bolts (66), the DIN 934 - M20 - 10 nuts and DIN 6916 - 21 - C45 washers.

Tightening torque of the gondola bolts  
= 430 Nm (317 ft lb)

Additionally secure the bolts (65) + (66) with spring rings (67).

- 66) Connect up the pneumatic lines and electric cabling.
- 67) The transport castors must not remain attached to the gondolas.
- 68) Lay the cables from the center structure to the location foreseen for the pay box.

#### Circular Flooring Structure as per Drawing 1-22.00E.0

- 69) Fit and bolt the flooring centering element.
- 70) First set up the longitudinal beams with the holders designed to take the diagonals.
- 71) Insert and bolt the diagonals.
- 72) Lay out the longitudinal beams, underpin them, insert the crossbeams and lay the bridging beams over them.
- 73) Take the sizes of the underpinning boards for the flooring from Drawing 1-22.00E.0.
- 74) Use the wooden template supplied with the ride to check that the ground clearance between the topmost point of the flooring longitudinal beams and the bottommost point of the gondola feet is at least 180 mm (7.09 inches). If necessary, adjust the height of the flooring.



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- 75) Fit the flooring plates, panelling, railing post mounting sockets, railings and illuminations masts.
- 76) Secure all pins with spring rings!

#### Control Cabin

- 77) Set up the base frame of the control cabin and securely underpin it with boards.
- 78) Place the control cabin on the base frame.

#### Backdrop in accordance with Drawing No. 1-22.00F

- 79) Bolt the backdrop uprights onto the longitudinal beams of the flooring and hook in the cross-ties with the crossover turnbuckle tie rod arrangements; put down the facade catwalk flooring sections.
- 80) Fit the holding brackets for the lettering scaffolding and the erection winch scaffolding onto the middle backdrop uprights.
- 81) Hook crossover turnbuckle tie rod arrangements into the holding brackets for the lettering scaffolding and put down the facade catwalk flooring sections.
- 82) Hook in the backdrop panels, fit the lettering and decorations.
- 83) Secure all pins with spring rings!

#### Decoration

- 84) Hook the decorative panels (44) onto the booms and secure.
- 85) Insert the posts (45), crossbeams, panelling (46) and illumination strips.

#### Dismantling

Dismantling is the same procedure as erection in exactly reverse order.



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The pressure rods on the transport securing facilities (6) + (15) must be pre-tensioned until an air gap appears under the stop (70).

It is essential to shut off the ball cock (41) before dismantling the lifting rods (20).

It is especially important to make sure that all electric cables and pneumatic hoses have been disconnected in good time!

All plugs and sockets must be protected against every kind of dirt or contamination!

The folding lids of the sockets must be kept closed when the sockets are not in use!

III. Daily Start-Up and Shutdown"MAGIC"Start-Up

1. On first-time operation from a new electric power source, check the correct phase sequence or direction of rotation of the hydraulic three-phase current motor!
2. Check that the notices with safety instructions are visibly and legibly displayed.
3. Check that the M 20 gondola mounting bolts are properly tightened.
4. Check that all threadless bolts and pins are properly secured by safety locking pins.
5. Check the hydraulic oil level and top up if necessary.
6. Check the oil levels of the four compressors.
7. Grease the teeth of the ball-bearing live ring slewing gear (see IV. E).
8. After every approx. 30 hours of operation, grease the lubricating nipples of the ball-bearing live ring slewing gear with ball-bearing grease (see IV. E).
9. Run the hydraulic aggregate at no-load for approx. 10 mins. In cold weather, run the ride at no-load for approx. 1 hour to reach to the right oil viscosity.
10. Run at least 3 complete ride programmes with empty gondolas using all control facilities and check the underpinning at the same time.
11. After the trail runs have gone off without a hitch, normal operation can be started.
12. All lap bars must be closed at all times during rides!

The amusement ride must not be accelerated beyond creeping speed until all persons on the platform are standing behind the railings or on the access steps.



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Shutdown

1. Run the gondolas to the embarkation position.
2. Switch off the hydraulic system on the control console and lock the console.
3. Switch off the main circuit-breaker in the switchgear cabinet and lock the cabinet.

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IV. Maintenance and Lubrication

Before starting any servicing work or beginning to remedy any malfunction, it is essential to switch off the drive units and to secure them against unauthorized or inadvertent re-activation!

A) DC Motors (47) (48)

See attached instructions from the makers, the Weier company.

B) Hydraulic System

The most important precondition for faultless and reliable operation is clean hydraulics.

Dirt in the hydraulic system causes a faster drop-off in pump performance and shortens the service life of all components. Dirt may also block operation control functions.

The whole hydraulic system contains approx. 200 liters (7 cu.ft.) of ESSO NUTO H 68 (SAE) hydraulic oil. The initial check on the condition of this oil should be carried out after 50 hours of operation. Change the oil, if necessary. Further oil changes every 1500 hours of operation.

New oil must always be poured into the oil tank through a clean filter with a filter grade of at least  $\mu = 40$  (0.002 inch).

Check the return flow filter (58) for clogging after the first two weeks of operation and clean if necessary; thereafter check at reasonable intervals.

Clean the magnetic needle (59) in the return flow filter daily during the first 2 weeks and thereafter at reasonable intervals.

B1) Pump for Lifting Device

High-pressure gear pump from Bucher, Type QT 43-032



### B2) Hydraulic Lifting Cylinder

The lifting cylinder has a built-in hose-break safety device. The packing seals on the cylinder must be exchanged when more than approx.  $\frac{1}{2}$  liter (8.45 fl.oz.) per day leaks out.

### B3) Hoses

All hoses are furnished with position numbers. It is essential to quote these numbers when ordering spares.

According to the instructions of the manufacturer, the hoses must be renewed after every 4000 hours of operation.

### C) Compressors

The oil level must always lie within the red ring. Overfilling may also be damaging. First oil change after 50 hours of operation; thereafter every 500 hours of operation but at least once every 12 months. Only use SAE 30 HD engine oils corresponding to Group VC-L of the German industrial standard DIN 51 506.

At reasonable intervals, the suction intake filter must be washed in suitable washing agents and then oiled.

Occasionally vent the safety valves by hand to prevent the valve seats from sticking.

Once a week, open the condensate drain valves on the tanks and let the condensate drain off under pressure.

Regularly check the condensate level in the transparent reservoir of the filter pressure reducer. It must never overstep the top mark or flood the splash baffle disk. Drain condensate off under pressure through the drain valve.

Now and again clean the cooling fins of the compressor. Good cooling is important for faultless operation.

#### Important !

If the ride is to be operated at minus temperatures, i.e. below freezing point, check back with the makers HUSS concerning the pneumatic system.



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D) Power Transmission

For the reduction gear, use ESSO GP 90 HYPOID gear oil (SAE 90 EP). The quantities required for new fillings are:

Rotation drive (50) : approx. 8.5 liters each  
(287 fl.oz.)

Lifting ring drive (51) : approx. 6 liters  
(203 fl.oz.)

Each of the gearboxes (50) (51) has an oil dipstick.

Gondola Triad Drive (52) : approx. 7.6 liters  
(257 fl.oz.)

Oil changes every 10,000 hours of operation or after 2 years.

E) Live Rings (53) (54) (55) (56) (57)

The teeth of the live rings must be lubricated practically daily, but at the latest when shiny metal surfaces appear on the tooth profiles; use MOLYKOTE 165 LT gear tooth grease or CALYPSOL High-grade gear tooth spray from UK-Mineralölwerke Wenzel & Weidmann, 5180 Eschweiler.

The ball-bearing mounted running tracks of the live rings must be lubricated every approx. 30 hours of operation with ESSO multi-purpose grease "BEACON EP 2". Lubricating nipples are provided for this purpose.

The live ring (55) for the lifting ring has 8 nipples.  
The live ring (56) for the gondola triad has 3 nipples.  
The live ring (57) for the gondolas has 7 nipples.

Turn the bearings while greasing them.

The arrangement of the lubricating nipples for live rings (53) and (54) may be seen from Sheet 4-23174. (see also the Maintenance and Lubricating Instructions of the HOESCH-ROTHER ERDE company).

At reasonable intervals, check the M 24 and M 20 fastening bolts on the 19 live rings for tightness and a firm seating. Use the torque wrench supplied with the ride.



However, in the case of some M 24 bolts at the joint between the center structure (1) and live ring (54), apply the angle tightening method. i.e. tighten the bolts to 100 Nm (74 ft.lb.) with the torque wrench and then turn each bolt through a further 72° with a striking-face wrench.

First undo the individual bolts and then tighten them again with:

- 1000 Nm (738 ft.lb.) for the M24 bolts or the angle tightening method
- 580 Nm (428 ft.lb.) for the M20 bolts.

The bearing play of the ball-and-socket joints must be checked annually. The permissible tolerances may be seen from the Maintenance and Instructions of the HOESCH-ROTHERDE company.

F) V-Belts

The four wedge belts (60) Type SPB L = 2020 mm  
(79.5 inches)  
and the eight wedge belts (61) Type SPB L = 3350 mm  
(131.9 inches)  
in accordance with DIN 7753 Sheet 1 must be protected against heavy soiling and dirt accumulation. Belt tension is adjusted by means of two tension screws on the drive motor. To tension the belts properly, the four screws on the sliding bedplate of the motor must first be slightly loosened. After each season, the V-belts should be checked to see if they need replacing. The tightening torque for the fastening screws of the sliding bedplate of the motor is 295 Nm (218 ft.lb.).

G) Bearings of the Swinging Arm, Lifting Structure, Lifting Rods and Lifting Cylinder

All bearing points are fitted with spherical plain bearings.

If any noises emanate from a bearing during swinging or swivelling movements, check the coating. If this is damaged, the bearing must be exchanged for a new one.



#### H) Hydraulic System for Erection of the Ride

The hydraulic aggregate with its oil tank is accommodated in the base of the ride. The whole erection hydraulics system contains approx. 50 liters (1.77 cu.ft.) of ESSO NUTO H 68 (SAE 20) hydraulic oil.

The most important precondition for faultless and reliable operation is a clean hydraulic system. Dirt in the hydraulic system causes a faster drop-off in pump performance and shortens the service life of all components. Dirt may also block operation control functions.

Always make sure that there is enough oil in the system. After long standstill periods (max. 2 months) as well as after an oil change, any air inclusions which may have formed inside the system must be eliminated. Several venting points are provided for this.

#### I) Hydraulic Displacement Steering of the Rear Axles and Trailer Tires of Road Models

For the valve settings of the transport chassis and how to adjust the wheel track, if necessary, see the Operating Manual of the BUNGE company.

Tires: 9.5 R 17.5  
Pressure: 9 bar (131 psi) at 62 km/h.

#### J) Pneumatic Holding Brake on the Gondola

At reasonable intervals, check the thickness of the brake linings and renew if necessary (see also attached Instructions of the BINDER company).

#### K) Socket Pins

To reduce wear and bearing noise, especially the boom pins (12) and (12a) and the gondola triad boom pins (72) and (72a) must be lubricated with graphite grease at reasonable intervals. For this purpose, pull the pins right out, grease them and replace.



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I M P O R T A N T

For the warranty to remain valid, only original HUSS  
spares may be used.!

When ordering, always state the serial number of the  
ride.

This number is to be found on the maker's nameplate  
attached to the front of the base.

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V.  
Safety Regulations  
for the  
Amusement Ride "MAGIC"

1. The maximum rotation speeds, starting and braking speeds as well as the lifting and lowering times set in the course of the acceptance testing procedures must be left unchanged.
2. The load must be spread as evenly as possible around the ride.
3. The public must only be permitted to access or stand on the embarkation and disembarkation platforms when the ride is at a standstill.
4. Children under 6 years of age and children less than 118 cm ( 3.9 ft. ) in height must be excluded from the ride.
5. Children from 6 to 8 years of age and children from 118 cm to 137 cm ( 3.9 - 4.5 ft. ) in height may only use the ride if accompanied by an adult, who is then responsible for supervising the child.
6. Entering the gondolas with animals or with umbrellas, sticks or other bulky or pointed objects must be prohibited.
7. Persons who are obviously drunk must be excluded from the ride.
8. Standing up, leaning out and sticking arms and legs out of the gondola during the ride must be prohibited.
9. Notices announcing the prohibitions and conditions contained in 4, 5, 6, 7 and 8 above must be prominently displayed on notices.
10. Daily prior to starting operation of the ride, all parts of the ride must be checked to ensure that they are in perfect working order. The Operating and Maintenance Instructions of the makers must be strictly observed.
11. The ride must not be started until all passengers are seated in the gondolas, the lap bars are closed and the operating personnel have checked that the lap bars are properly locked.
12. Prior to first-time operation, every time the ride is newly erected and then once a week thereafter, the rotation speed monitoring equipment of the electrical system must be checked in accordance with the Operating Instructions.



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13. To permit the ride to be swiftly brought to a standstill in case of critical situations, not only the emergency stop button must be pressed, but also the individual brake push-buttons.
14. The Ride must be properly underpinned with support blocks/boards in accordance with the Underpinning Plan; the underpinning must be kept as low as possible.
15. All connecting elements must be suitably secured against inadvertent loosening. Railings and barriers must be secured so that they cannot be lifted out of their mountings.
16. Besides the operator in the control cabin, at least one other attendant is necessary to supervise those parts of the ride which cannot be seen from the control cabin and to give the operator hand signals when the ride is clear for operation.

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VI.

Maintenance Instructions for Fiberglass Surfaces

We use only first-class materials to produce the surface finish of our fiberglass components. Although these require very little maintenance, they cannot do entirely without maintenance. To retain the brilliant surface gloss for a long time we recommend you to:

1. Clean the surfaces at least every 14 days with clear water and then polish with a leather cloth.
2. Never rub dust or dirt off the surfaces when dry.
3. Clean the surfaces with a solution of water and household washing-up liquid or similar as required but at the latest every 3 months; after drying, apply a good automobile wax and polish with a soft cloth.
4. If you use a high-pressure steam jet, never work with chemicals which are more aggressive than soapy water.
5. If you use a high-pressure steam jet with chemicals which comply with Point 4, wax and polish the surfaces again afterwards.
6. Stubborn spots and stains can be swiftly removed with moist acetone cloths; keep the contact time with acetone to a minimum.  
Immediately after working with acetone or cleaning benzine, wash the surface well with clear water and then wax and polish.

SERVICE LETTER MA-01  
ISSUED BY HUSS MASCHINENFABRIK  
FEBRUARY 19, 1992



RE: LAP BAR WARNING LABELS

To prevent possible finger and hand injuries should a passenger misplace hands on either the locking mechanism plate or the pin outside of the lap bar, Huss Maschinenfabrik proposes the attachment of "Warning Labels" placed in a visible spot on the inside of gondolas.

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