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AEROSPACE RECOMMENDED PRACTICE

ARP 1348

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Revised

BAGGAGE/CARGO TRAILER REQUIREMENTS

1. PURPOSE

This Aerospace Recommended Practice (ARP) provides recommendations for the design and use of trailer equipment which will permit safe operations, and which will minimize exposure to inadvertent disconnections of trailers while being towed.

2. SCOPE

This ARP applies to airline trailer equipment with four wheel running gear pulled and steered through an integral towbar; and which is used on airport ramps and other airport areas for transportating baggage, freight and other materials.

3. TRAILER DESIGN CONSIDERATIONS

Designs for trailer units planned for in-train towing should include the following considerations:

3.1 In lieu of specifically stated speed requirements, provide for towing speeds up to 25 miles per hour (40 km/hr).

3.2 Ensure that in-train towing loads are transmitted internally along the line of towbar pull. This requires that a continuous sill member connects the axles, and that the front and rear couplers have suitable load path structure to transmit towing-forces through and between trailers. Bending loads on the axle supports and the frame should be avoided.

3.3 Anticipate for all dynamic loads. Impact loads on tongues, pintles, and chassis frames are frequently critical and require careful analysis to establish their magnitude and frequency.

3.4 When towing trailers in train, consider the gross weight and load multiplying factor. Unless the procuring activity specifies otherwise, assume that the number of trailers that might be towed in train is a function of the length of a single trailer, as follows:

TABLE I

Single Trailer Length (Overall) ft (m)		*No. of Units Towed in Train
Less than 12	(3.66)	6
12 - 15	(3.66 - 4.57)	5
15 - 20	(4.57 - 6.10)	4
20 - 25	(6.10 - 7.62)	3
More than 25	(7.62)	2

*NOTE: These values are for design use only. Operational and gross weight considerations or requirements may dictate the use of fewer trailers in a train than the number indicated.

3.5 Running gear should be completely within the confines of the frame. All steering linkages, brake system components or other mechanisms located beneath the trailer, should be protected from damage.

3.6 Trailer wheel designs should limit loads on ramp surfaces, at full gross weight, to not exceed 100 lb/in.^{2} (7.03 kg/cm^2).

3.7 The trailer should be capable of being towed at 15 mph (24 km), when loaded to 50% of rated load capacity, across a normally smooth ramp without generating vertical accelerations in excess of 2g.

3.8 The force to actuate any lever or towbar should not exceed 30 lb (13.6 kg).

3.9 Welds and welding shall be accomplished in accordance with the recommendations of ARP 1330, Welding of Structures For Ground Support Equipment.

3.10 The bed perimeter frame should be designed to sustain heavy impact loading - generously radiused corners, front to rear tapered rub rails or similar design features for deflecting impact loads should be provided.

4. STEERING

4.1 For trailers with steering through the towbar, provide adequate mechanical advantage to permit easy movement of the controlling wheels under static full load condition by one man.

4.2 Design for turning radius as short as possible. Provide stops if necessary to either prevent damage to the axle, or to prevent fifth-wheel steering design from turning past an angle which would create significant instability of trailers during turns. Design the load carrying mechanism to withstand stresses induced by towed vehicles or personnel, attempting to turn the equipment shorter than the stops will allow.

4.3 Consistent with the type of steering provided, design the trailer geometry so that the wheels of the last trailer in the train will track the wheel path of the first trailer, as closely as possible, in a series of successive full left and right turns.

5. BRAKES

Provide trailer units with a parking brake system which applies brakes to at least two wheels. The brakes should be self equalizing, and should be capable of locking each wheel against a tangential force, applied at the periphery of the wheel (in either direction) which is equal to the trailer gross weight divided by the number of braked wheels. The trailer gross weight is trailer weight plus the rated load capacity. If required by the procuring activity, the parking brakes shall be actuated by placing and locking the towbar in the up position. Otherwise, the brakes shall be actuated by a positive locking operating lever.

6. TOWING FORCE

The towing force required to move the trailer on level concrete at maximum gross weight should not exceed 50 lb (23 kg) rolling 80 lb (36 kg) breakaway per ton (907 kg) of weight.

7. TOWBAR

7.1 The towbar shall swivel in the vertical plane. A stop shall be provided to prevent the towbar from contacting the ground.

7.2 In lieu of special requirements specified by the procuring activity, towbar eyes shall meet the strength requirement of paragraph 8, and shall conform to the dimensional requirements of SAE J847.