

CHAPTER

09

**TOWING AND
TAXIING**



**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**

**CHAPTER 09
TOWING AND TAXIING**

Subject/Page	Date	COC	Subject/Page	Date	COC	Subject/Page	Date	COC
09-EFFECTIVE PAGES			09-10-00 (cont)					
1	Sep 15/2023		231	Jan 15/2023				
2	BLANK		R 232	Sep 15/2023				
09-CONTENTS			R 233	Sep 15/2023				
1	Jan 15/2023		234	May 15/2023				
2	BLANK		235	May 15/2023				
09-10-00			236	May 15/2023				
201	Jan 15/2023		237	May 15/2023				
202	Jan 15/2023		238	May 15/2023				
203	Jan 15/2023		R 239	Sep 15/2023				
204	Jan 15/2023		R 240	Sep 15/2023				
R 205	Sep 15/2023		R 241	Sep 15/2023				
206	Jan 15/2023		R 242	Sep 15/2023				
207	Jan 15/2023		A 243	Sep 15/2023				
208	Jan 15/2023		A 244	BLANK				
209	Jan 15/2023		09-10-04					
210	Jan 15/2023		201	Sep 15/2021				
211	Jan 15/2023		202	May 15/2023				
212	Jan 15/2023		203	Sep 15/2021				
213	Jan 15/2023		204	BLANK				
214	Jan 15/2023		09-20-00					
215	Jan 15/2023		201	Sep 15/2021				
216	Jan 15/2023		202	May 15/2022				
217	Jan 15/2023		203	May 15/2022				
218	Jan 15/2023		204	May 15/2023				
219	Jan 15/2023		205	Sep 15/2021				
220	Jan 15/2023		206	May 15/2022				
221	Jan 15/2023		207	Sep 15/2021				
222	Jan 15/2023		208	Sep 15/2021				
223	Jan 15/2023		209	Sep 15/2021				
224	Jan 15/2023		210	Sep 15/2021				
225	Jan 15/2023		211	May 15/2022				
226	Jan 15/2023		212	May 15/2022				
227	Jan 15/2023							
228	Jan 15/2023							
229	May 15/2023							
230	Jan 15/2023							

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

09-EFFECTIVE PAGES



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 09
TOWING AND TAXIING

<u>SUBJECT</u>	<u>CHAPTER SECTION SUBJECT</u>	<u>CONF</u>	<u>PAGE</u>	<u>EFFECT</u>
<u>TOWING - MAINTENANCE PRACTICES</u>	09-10-00		201	SIA ALL
Nose Gear Maintenance Towing TASK 09-10-00-580-801			204	SIA ALL
Main Gear Maintenance Towing TASK 09-10-00-580-802			223	SIA ALL
Pushback Towing TASK 09-10-00-580-803			232	SIA ALL
Airplane Towing in High Winds TASK 09-10-00-580-804			239	SIA ALL
<u>TOW THE AIRPLANE WITH FLAT TIRES - MAINTENANCE PRACTICES</u>	09-10-04		201	SIA ALL
Tow the Airplane with Flat Tire(s) TASK 09-10-04-580-801			201	SIA ALL
<u>TAXI THE AIRPLANE - MAINTENANCE PRACTICES</u>	09-20-00		201	SIA ALL
Taxi the Airplane TASK 09-20-00-580-801			203	SIA ALL

09-CONTENTS



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

TOWING - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Nose Gear Maintenance Towing
- (2) Main Gear Maintenance Towing
- (3) Pushback Towing
- (4) Towing the Airplane in High Winds.

B. Definitions

- (1) Maintenance Towing - To move the airplane for maintenance or to park the airplane in an isolated area. For example from the gate to a maintenance hangar. The airplane is usually released with a minimum fuel load.
- (2) Pushback Towing - To move an airplane with Maximum Ramp Weight (MRW) (full load) from a parked position to the taxiway. To pushback with a turn, a stop, and a short tow movement forward to align the airplane and nose wheels. The engines can be operating or not. The airplane movement is similar to the pushback procedure that uses a tow bar.
- (3) Dispatch (Operational) Towing - To move an airplane with MRW, passengers, fuel, and cargo from the airport gate or isolated location to a location near the runway. The tow distance can be many miles (kilometers) with speeds to 20 mph (17 knots), with many starts, stops, and turns. This procedure replaces the usual taxi operation.

C. Tow Safety

- (1) The tow procedure must be done only by persons that are trained to tow the airplane.
- (2) The tow path must be clear of all persons and vehicles.
- (3) Approval from the airport ground-control is necessary to tow the airplane.
 - (a) This will prevent blockage of other airport operations.
- (4) Keep clearance from the buildings and the other airplanes, at all times.
- (5) Electrical power is necessary to tow the airplane safely:
 - Operate radio and intercom equipment.
 - Turn on the position light as necessary.
 - Turn on the anti-collision light as necessary.
 - Turn on the transponder as necessary.
 - Turn on the APU as necessary.
 - Verify brake pressure as needed.
 - Operate other necessary systems.
- (6) Look for lateral fuel imbalance condition.

NOTE: When an airplane is moved with a lateral fuel imbalance that is more than the limits while on the ground, a structural inspection is not required. This is only if usual tow procedures were followed, the maximum tow speed was below 25 mph (22 knots) and no maximum or hard braking occurred. If these limits were exceeded, then a structural inspection is necessary.

- (7) Hydraulic pressure is necessary to operate the brakes.
 - (a) Supply hydraulic power to hydraulic system B.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 201
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- (b) If hydraulic system B is not used or is not operational, then make sure that there is approximately 3000 psi (20,684 kPa) in the brake accumulator.

NOTE: To tow the airplane with brakes that operate, the brake accumulator must have approximately 3000 psi (20,684 kPa).

NOTE: If electrical power is not available, make sure that the pressure gage for the brake accumulator reads 3000 psi (20,684 kPa).

- (8) Adjust the captain seat if necessary to reach the airplane brakes.

NOTE: Use the handhold above the forward window as aid when pulling the seat forward. Do not use the glare shield because damage can occur.

- (9) The crew must know the ground and weather conditions, and make sure that the area around the airplane is safe for towing.

- (10) Tow speeds must not be faster than the slowest ground crew member.

NOTE: Tow speeds must not exceed 20 mph (17 knots) when towing without wing-walkers.

- (11) To complete towing procedure:

- (a) Move the airplane to a slow and smooth stop.
- (b) Make sure with the tow operator and ground crew that the airplane stopped.
- (c) Set the parking brakes as told by ground crew.
- (d) Turn off the airplane systems.
- (e) Make sure it is safe to exit the airplane.

- (12) Use a checklist to make sure that the airplane tow operation is safe.

D. Communications

- (1) The flight compartment windows decreases the field of view and the ground operations near the airplane.
- (2) There must be clear communication between the airplane and the ground crew during all of the tow operation.
- (3) Use hand signals, lights, intercom, or radio communications for safe tow procedures.
- (4) Communicate with the ground control authority to let the control tower know the airplane path and tow operation.

E. The airplane is designed to tow the airplane from the nose or the main landing gear in a forward or rearward direction.

F. The airplane can be towed with one or both engines removed if the CG stays forward of the aft center of gravity limits.

- (1) Refer to Table 201 and Table 202 for nose gear maintenance towing.
- (2) Refer to Table 203 and Table 204 for main gear maintenance towing.

G. Tow the Airplane

(1) Nose Gear Towing

- (a) A nose gear tow fitting is used to tow the airplane with a tow bar installed (Figure 205).
- (b) The airplane can be towed on firm level ground with one flat tire on each main landing gear if start loads are kept to a minimum.
- (c) When two tires on one main gear are flat, replace one flat tire with a serviceable tire, if possible. This will prevent damage to the tires and wheels. Refer to Tow the Airplane with Flat Tire(s), TASK 09-10-04-580-801.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 202
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- (d) Do not use the nose gear to tow the airplane if these conditions exist:
 - Towing the airplane on soft ground with two flat tires on one main gear.
 - Towing the airplane on inclines of 5 degrees or more.
- (2) Main Gear Towing
 - (a) The towing eyebolt assembly is installed in the hole on the bottom of each main gear oleo and can be installed on the forward or aft side of the oleo lug for forward or backward towing.
- (3) Towbarless Tow Vehicle (TLTV) Towing
 - (a) The towing stability of a TLTV/airplane combination is dependent on many variables. Two of the key variables are the characteristics of the tow vehicle tractive forces and runway conditions. The maximum towing speeds are the responsibility of the airplane operator and the airport authorities, with recommendations from the TLTV manufacturer.



DO NOT APPLY THE AIRPLANE BRAKES WHEN YOU TOW THE AIRPLANE WITH TOWBARLESS TOW VEHICLES. MOST TOWBARLESS TOW VEHICLES DO NOT HAVE A SHEAR PIN TO LIMIT THE LOADS IF THE AIRPLANE BRAKES ARE USED DURING TOWING. IF YOU APPLY THE BRAKES, YOU CAN APPLY LOADS TO THE NOSE LANDING GEAR THAT ARE MORE THAN THE DESIGN LOAD LIMITS. IF YOU DO NOT OBEY THIS WARNING, MAINTENANCE PERSONS CAN BE INJURED, AND DAMAGE WILL OCCUR TO THE NOSE LANDING GEAR, AND THE TOW VEHICLE.

- (b) The towbarless equipment is used to push or pull the airplane for push back or maintenance towing. Refer to the manufacturer's manual.
- (c) Make sure the maximum permitted loads on the nose landing gear are not more than the maximum towing loads as shown in (Figure 203).
- (d) Make sure the maximum tow speed is no greater than 20 mph (17 knots) or the maximum rated tow speed for the TLTV being used, whichever is less.
- (e) Boeing recommends towbarless tow vehicles be designed, tested, operated, and maintained per the following Society of Automotive Engineers (SAE) Aerospace Recommended Practices (ARP), and applicable Boeing documentation:
 - 1) SAE ARP 4852: Specification for Towbarless Push-Back Tow Vehicles.
 - 2) SAE ARP 4853: Specification for Towbarless Tow Vehicles (TLTV).
 - 3) SAE ARP 5283: Towbarless Tow Vehicles - Aircraft Nose Landing Gear Steering and Tractive Force Protection Systems or Alerting Devices - Inspection, Maintenance, and Calibration Requirements.
 - 4) SAE ARP 5285: Towbarless Towing Vehicle Operating Procedure.
 - 5) Boeing document D6-56872: Towbarless Towing Vehicle Assessment Criteria.
 - 6) Boeing Service Letter 737-SL-09-002: Towbarless Towing Evaluation.

NOTE: Airlines must make sure that the latest revisions of the standards and documents are applied.

NOTE: The service letter provides additional guidance and information regarding towbarless towing recommendations and regulatory requirements.

- H. When ground handling, the airplane center of gravity (CG) must always be forward of the aft CG limit (Figure 202).

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-10-00

Page 203
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

- (1) When the CG is forward it will accommodate for inclines, winds and acceleration forces as noted.
- (2) Make sure that the towing CG configuration is correct to make sure that the CG is forward of the towing limit.
- (3) If the aft towing limit CG is more than the center of gravity limits, it is recommended to add ballast or fuel, to move the CG forward.

TASK 09-10-00-580-801

2. Nose Gear Maintenance Towing

A. General

- (1) This task gives the instructions to tow the airplane from the nose landing gear for usual towing conditions.
- (2) Make sure that you read the General statement at the start of this procedure. To tow the airplane correctly, you must know these cautions and procedures:
 - (a) Tow Safety
 - (b) Communications
 - (c) Tow the Airplane

B. References

Reference	Title
05-51-01-210-801	Phase I Inspection (P/B 201)
05-51-29-200-801	Phase I Inspection (P/B 201)
05-51-29-200-802	Phase II Inspection (P/B 201)
09-10-04-580-801	Tow the Airplane with Flat Tire(s) (P/B 201)
10-11-05-500-801	Chock Installation Winds/Gusts Maximum 40 mph (35 Knots) (P/B 201)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-41-610-802	Nose Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-51-780-801	Landing Gear Tire Pressure Check and Tire Servicing (P/B 301)
24-22-00-860-805	Supply APU Generator Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-21-31-000-803	Nose Landing Gear Torsion Link Disconnection (P/B 401)
32-21-31-400-803	Nose Landing Gear Torsion Link Connection (P/B 401)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-802-G00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-801-G00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 204
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

Reference	Description
COM-959	Tractor - Towbarless (TLTV) Part #: AP8950SDB-AL-200 Supplier: 58742 Part #: EXPEDITER 160 Supplier: 93408 Part #: EXPEDITER 310 Supplier: 93408 Part #: GTL160 Supplier: SW482 Part #: GTL300 Supplier: SW482 Part #: Spacer 8600 Supplier: 6X2T Part #: TBL-280 Supplier: AN46N Part #: TPX-200-MT Supplier: 6L481 Part #: TPX-200-MTS Supplier: 6L481
COM-1500	Towbar - Airplane, Towing and Steering Part #: 01-1246-0010 Supplier: 59603 Part #: 15F2716 Supplier: 56535 Part #: 15F2930 Supplier: 56535 Part #: 15F3164 Supplier: 56535 Part #: 15F3340 Supplier: 56535 Part #: 1793.00 Supplier: 1777B Part #: 200470-1 Supplier: 9M323 Part #: 200470-5 Supplier: 9M323 Part #: 300460-737Q Supplier: 9M323 Part #: F794 Supplier: 56535 Part #: FIL11060 Supplier: \$1341 Part #: J-TOW737-C Supplier: CD856 Part #: Model 15F3340 Supplier: 56535 Part #: PF09-009-1 Supplier: 3D5B2 Part #: TOUNIV3S Supplier: D2029 Part #: TOWB737S Supplier: D2029 Opt Part #: 15F1295 Supplier: 56535 Opt Part #: 794 Supplier: 56535 Opt Part #: TOWB737-C Supplier: D2029
SPL-1499	Pin - Lock, NLG Towing Lever Part #: A09003-2 Supplier: 81205 Opt Part #: A09003-1 Supplier: 81205
STD-3731	Streamer - REMOVE BEFORE FLIGHT

D. Location Zones

Zone	Area
700	Landing Gear and Landing Gear Doors

E. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 205
Sep 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

F. Prepare for the Towing

SUBTASK 09-10-00-910-001



ALL WORK AROUND THE AIRPLANE MUST STOP WHEN LIGHTNING OCCURS AT A DISTANCE OF 6 MILES (10 KILOMETERS) OR LESS. ALL PERSONNEL MUST GO IN A BUILDING OR THE AIRPLANE. LIGHTNING CAN KILL PERSONNEL OR CAUSE INJURY.

- (1) Make sure that the weather condition is suitable for the towing operation.

SUBTASK 09-10-00-840-003



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED. WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (2) Remove the tail stand.

SUBTASK 09-10-00-211-001

- (3) Make sure that there is no damage to the nose landing gear.

SUBTASK 09-10-00-580-001



DO NOT TOW WITH A DAMAGED NOSE GEAR. IF THE NOSE GEAR IS DAMAGED, TOW THE AIRPLANE ONLY FROM THE MAIN GEAR.

- (4) If there is damage on the nose landing gear, tow the airplane from the main landing gear (TASK 09-10-00-580-802).

SUBTASK 09-10-00-480-001

- (5) Install the wheel chocks (TASK 10-11-05-500-801).

SUBTASK 09-10-00-440-001

- (6) Set the parking brakes.

SUBTASK 09-10-00-410-006



OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (7) Do these tasks in sequence to safely close the applicable left or right thrust reversers:
- (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-802-G00.
- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 206
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

(Continued)

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

426	Right Thrust Reverser, Engine 2
-----	---------------------------------

(b) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
---------------	----------------------

413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

(c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-801-G00.

SUBTASK 09-10-00-580-002

(8) Put an approved brake operator in the flight compartment.

(a) Adjust the captain seat if necessary to reach the airplane brakes.

NOTE: Use the handhold above the forward window as aid when pulling the seat forward. Do not use the glare shield because damage can occur.

SUBTASK 09-10-00-560-001



DO NOT CONNECT A HEADSET, OR TOUCH CONNECTIONS TO THE AIRPLANE WHEN THERE IS LIGHTNING, OR IN STRONG ELECTROMAGNETIC FIELDS. LIGHTNING, AND ELECTRICAL CURRENT CAN CAUSE INJURIES TO PERSONNEL.



MAKE SURE THAT THE TOW TRACTOR OPERATOR, THE GROUND CREW, AND THE FLIGHT COMPARTMENT CREW CAN SPEAK TO THE OTHERS. IF THEY CAN NOT SPEAK TO THE OTHERS, AIRPLANE MOVEMENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO THE EQUIPMENT.

(9) Position the flight compartment crew, the tow tractor operator, and the ground crew to where they can see and communicate each other.

SUBTASK 09-10-00-480-002



WHEN YOU USE A TOW BAR TO MOVE THE AIRPLANE IN HIGH WINDS, CONNECT THE TOW BAR BEFORE YOU INSERT THE TOWING LEVER LOCKPIN (NLG TOWING LEVER PIN). THE AIRPLANE COULD MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



ONLY USE THE CORRECT PIN FOR THE AIRPLANE MODEL. IF YOU USE AN INCORRECT PIN, THE HYDRAULIC STEERING CAN OPERATE. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(10) Install the nose gear steering lockout pin as follows (Figure 201):

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 207
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



MAKE SURE THAT YOU PUT THE TOWING LEVER IN THE TOW POSITION BEFORE YOU TOW THE AIRPLANE. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO LANDING GEAR COMPONENTS OR THE TOWING EQUIPMENT.

- (a) Move the towing lever forward to the tow position.

NOTE: The towing lever is at the left forward side of the steering metering valve and is spring-loaded in the off position. A placard installed on the cover shows which direction to put the tow lever, TOW POSITION or NORMAL POSITION.



IF THE NOSE GEAR STEERING LOCKOUT PIN IS NOT INSTALLED, MAKE SURE THAT THE PRESSURE IN HYDRAULIC SYSTEM A IS COMPLETELY REMOVED BEFORE TOWING THE AIRPLANE. IF YOU DO NOT OBEY THIS WARNING, YOU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE STEERING COMPONENTS.

- (b) Install the NLG towing lever pin, SPL-1499, with a REMOVE BEFORE FLIGHT streamer, STD-3731, in the lever pin hole to hold the lever in the towing position (Figure 201).

SUBTASK 09-10-00-420-003

- (11) Install the landing gear downlock pins on the nose and main landing gear (TASK 32-00-01-480-801).

NOTE: It is optional to install the landing gear downlock pins when you tow or push the airplane for taxi and departure.

SUBTASK 09-10-00-610-001



DO NOT TOW THE AIRPLANE WITH A FULLY COMPRESSED LANDING GEAR SHOCK STRUT. IF YOU TOW THE AIRPLANE WITH A FULLY COMPRESSED SHOCK STRUT, DAMAGE TO THE AIRPLANE CAN OCCUR.

- (12) Make sure that the landing gear shock struts have the correct extension as follows:

NOTE: The nose landing gear and main landing gear shock struts are deflated when the dimension "X" is below the servicing band. The landing gear shock struts are fully compressed when dimension "X" is equal to 13.8 in. (35.1 cm) on the nose landing gear and 0.9 in. (2.3 cm) on the main landing gear.

- (a) Refer to the servicing chart in the wheel well to check for the minimum main gear shock strut extension for towing.

SUBTASK 09-10-00-600-001

- (13) If it is necessary, service the landing gear shock struts (TASK 12-15-41-610-802 and TASK 12-15-31-610-802).

SUBTASK 09-10-00-610-002

- (14) Make sure that the landing gear tires have the correct tire pressure (TASK 12-15-51-780-801).

SUBTASK 09-10-00-860-010

- (15) Do this task: Supply APU Generator Power, TASK 24-22-00-860-805.

SUBTASK 09-10-00-210-002

- (16) Make sure that the STBY power switch on the P5 panel is in the AUTO position.

SUBTASK 09-10-00-280-001

- (17) Supply hydraulic power to hydraulic system B (TASK 29-11-00-860-801).

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 208
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-210-001

- (18) If hydraulic system B is not used or is not operational, do this step:
- (a) Make sure that the hydraulic brake accumulator pressure is approximately 3000 psi (20,684 kPa).

NOTE: To tow the airplane with brakes that operate, the brake accumulator must have approximately 3000 psi (20,684 kPa). You can apply the brakes two to six times when the brake accumulator pressure is approximately 3000 psi (20,684 kPa).

NOTE: If electrical power is not available, you can verify the pressure at the gage on the brake accumulator.

SUBTASK 09-10-00-280-002

- (19) If it is necessary, adjust the lateral fuel imbalance for the No. 1 and No. 2 main fuel tanks.

NOTE: When an airplane is moved with a lateral fuel imbalance that is more than the limits while on the ground, a structural inspection is not required. This is permitted only if taxi procedures were followed, the maximum taxi speed was below 29 mph (25 knots) and no maximum or hard braking occurred. If these limitations were exceeded, a structural inspection is required. Contact Engineering for a specific bill of work.

SUBTASK 09-10-00-580-003

- (20) Make sure that the airplane gross weight and center of gravity are within the permitted limits (Figure 202).

SUBTASK 09-10-00-970-001

- (21) If components are moved, added to or removed from the airplane, refer to the table below to show the shift in the weight and CG changes.

Table 201/09-10-00-993-801 Weight and Center of Gravity Changes

SHIFTS	WEIGHT		CENTER OF GRAVITY (CG)	MOMENT WEIGHT X BALANCE ARM ^{*[1]}	
				(LB) 75,000	(BA) 678
	LB	KG	BALANCE ARM (BA)	IN.	%MAC
ONE MAN IN PILOT'S SEAT	200	90.7	32	-1.6	-1.0
ONE MAN IN CABIN AT BS 990	200	90.7	1202	1.3	0.8
1000 LB ATTACH TO THE NOSE GEAR	100	453.6	93	-7.3	-4.7
1000 LB LOADED IN THE FWD CARGO HOLD AT (CENTEROID)	100	453.6	360.7	-4.0	-2.6
ONE ENGINE REMOVED ^{*[2]}	10643	4828	551.5	13.6	8.7
TWO ENGINES REMOVED ^{*[2]}	21286	9656	551.2	30.4	19.5

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 209
Jan 15/2023



**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**

Table 201/09-10-00-993-801 Weight and Center of Gravity Changes (Continued)

SHIFTS	WEIGHT		CENTER OF GRAVITY (CG)	MOMENT WEIGHT X BALANCE ARM ^{*[1]}	
				(LB) 75,000	(BA) 678
	LB	KG	BALANCE ARM (BA)	IN.	%MAC
FUEL IN THE WING TANKS (7.1 LB/GAL)	2500	1134.0	657.3	-8.0	-0.5
	5000	2268.0	660.24	-1.3	-0.9
	7500	3401.9	663.49	-1.7	-1.1
	10,000	4535.9	668.58	-1.6	-1.0
	12,500	5669.9	675.88	-1.0	-0.6
	15,000	6803.9	684.93	0.3	0.2
	17,500	7937.9	696.06	2.3	1.5
	18,289	8294.8	700.71	3.3	2.1
FUEL IN THE CENTER TANK (7.1 LB/GAL)	2500	1134.0	607.95	-2.3	-1.5
	5000	2268.0	605.22	-4.6	-2.9
	7500	3401.9	604.75	-6.7	-4.3
	10,000	4535.9	604.85	-8.7	-5.6
	12,500	5669.9	605.22	-10.5	-6.7
	15,000	6803.9	605.71	12.2	-7.8
	17,500	7937.9	606.13	-13.8	-8.9
	20,000	9071.8	606.46	-15.3	-9.8
	22,500	10,205.8	606.69	-16.8	-10.8
	25,000	11,339.8	606.74	-18.2	-11.7
	27,500	12,473.8	606.38	-19.6	-12.6
	30,000	13,607.8	605.59	-21.1	-13.5
	30,523	13,845.0	605.39	-21.4	-13.8

*[1] The airplane configuration must be examined to make sure that the center of gravity (CG) is forward of the applicable limit. If the aft towing is more than the limit, move the center of gravity forward, add fuel or ballast. The table shows the effect that some components have on the CG location of the airplane. A forward shift will show as a minus (-) sign.

*[2] See table below.

Table 202/09-10-00-993-804

737MAX	One Engine	Two Engines
Engine (Dry)	6009 lb (2726 kg)	12018 lb (5452 kg)
Ready For Installation (RFI) Engine	7260 lb (3293 kg)	14520 lb (6586 kg)
Total Propulsion System	10643 lb (4828 kg)	21286 lb (9656 kg)

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 210
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

Table 202/09-10-00-993-804 (Continued)

737MAX	One Engine	Two Engines
Note: Source extracted from the Boeing Engine Ground Handling (D626AM003) Engine (Dry): Assembled engine as furnished by the engine manufacturer that w/o Inlet, Engine Mounts, Thrust Links, Generator, Fuel Pump, Nozzle, Plug and Engine Build-Up (EBU) System EBU System: Electrical + Pneumatic and Hydraulic Lines + Fuel Pump + Hydraulic Pump + Starter Valve RFI Weight: Engine (Dry) + Engine Mounts (FWD & AFT) + Thrust Links + Inlet + Nozzle + Exhaust Plug + Integrated Drive Generator (IDG) and Quick Access Disconnect (QAD) + EBU System + Engine Fluids Total Propulsion Weight: RFI Weight + Fan Cowls (both engines) + Thrust Reverser Ducts + Strut Structure + Systems + Precooler + Equipment Install (Strut to Wing) + AFT Strut Fairings + Strut Wing Attach Links + Strut to Wing Fairings Weight Tolerance $\pm 1.0\%$		

SUBTASK 09-10-00-580-004

- (22) If the nose gear angle will exceed the maximum 78 degrees, do these steps (Figure 204):
- NOTE: A red stripe is painted on the outside of each nose landing gear door. When the tow bar aligns with the red stripe, the wheels are at 78 degrees.
- (a) Disconnect the torsion links (TASK 32-21-31-000-803).
- NOTE: The nose gear steering will not operate.
- (b) Use a rope to hold the torsion links to prevent damage to the links when you tow the airplane.

SUBTASK 09-10-00-580-005

- (23) Make sure that the maximum tow angles and loads are within the permitted limits (Figure 203).
- NOTE: Towing trials have shown that during normal towing operations, including breakaway, turning and smooth stopping, loads do not exceed the maximum permitted tow loads for the landing gear.
- NOTE: Normal towing is defined as a smooth breakaway push/pull and stop of the airplane with the nose wheel in a straight position. Towing start and stop with the nose wheel at an angle can cause the loads to exceed the maximum permitted tow loads for the landing gear.

SUBTASK 09-10-00-410-002

- (24) Make sure that the electronic compartment access door is closed.

SUBTASK 09-10-00-020-001

- (25) Remove the airplane static ground wires.

SUBTASK 09-10-00-580-006



WHEN YOU TOW THE AIRPLANE, STAY OUT OF THE DANGEROUS AREAS AROUND THE TOW VEHICLE, TOW BAR, AND AIRPLANE TIRES. IT IS POSSIBLE FOR THE TIRES AND EQUIPMENT TO PULL YOU BELOW THEM WHILE THE AIRPLANE CHANGES POSITIONS AND DIRECTIONS. IF YOU DO NOT KEEP THIS SEPARATION, INJURY TO PERSONNEL CAN OCCUR.

- (26) Make sure that the ramp area is clear of all stands and equipment in the towing path.

SUBTASK 09-10-00-560-003

- (27) Put the tow vehicle in position.

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-10-00

Page 211
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-480-003

- (28) If you will use a towbar, COM-1500, attach the towbar to the nose landing gear tow fitting as follows:

(a) Make sure that you install the correct shear pins.

SUBTASK 09-10-00-480-013

- (29) If you will use a towbarless tow tractor, COM-959, attach the tractor to the airplane.

SUBTASK 09-10-00-080-001

- (30) Remove the wheel chocks.

SUBTASK 09-10-00-040-001

- (31) Release the parking brakes.

G. Nose Landing Gear Towing

SUBTASK 09-10-00-700-001



DO NOT HOLD OR TURN THE TILLER FOR THE NOSE WHEEL STEERING WHILE YOU TOW THE AIRPLANE. IF YOU HOLD OR TURN THE TILLER, DAMAGE TO THE NOSE WHEEL STEERING SYSTEM CAN OCCUR.

- (1) Make sure that the nose wheel steering tiller is free to move.

SUBTASK 09-10-00-560-004



GROUND PERSONNEL ARE PROHIBITED FROM ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING. MAINTAIN MINIMUM OF 10 FT (3 M) AWAY FROM LANDING GEAR, TOWBAR, AND TOW TRACTOR. ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING CAN CAUSE INJURY OR DEATH TO PERSONNEL.

- (2) Keep all persons and operators away from the pushback hazard zones (Figure 206).

SUBTASK 09-10-00-580-007



THE ISFD POWER MUST BE ON FOR 90 SECONDS BEFORE YOU MOVE THE AIRPLANE. IF YOU DO NOT LET THE ISFD POWER-ON FOR 90 SECONDS IT WILL CAUSE THE ISFD TO GIVE INCORRECT ATTITUDE INFORMATION TO THE FLIGHT CREW AFTER TAKEOFF.

- (3) Do not tow or move the airplane for 90 seconds after the ISFD is powered on.

SUBTASK 09-10-00-580-008



MAKE SURE THAT YOU PUT THE TOWING LEVER IN THE TOW POSITION BEFORE YOU TOW THE AIRPLANE. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO LANDING GEAR COMPONENTS OR THE TOWING EQUIPMENT.

- (4) Start the towing operation with a slow and smooth movement.

NOTE: The entry or lower cargo doors can be open when you tow the airplane, unless there are high winds.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 212
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



OBEY THESE PRECAUTIONS. IF YOU IGNORE THESE PRECAUTIONS, DAMAGE TO EQUIPMENT WILL OCCUR.

- (a) Move the airplane forward before you start to make sharp turns.
- (b) Make sure that you do not make sudden starts or stops.
- (c) If you will tow the airplane during unusual conditions, do these steps:
 - 1) High winds, do this task: Airplane Towing in High Winds, TASK 09-10-00-580-804.
 - 2) Flat tire(s), do this task: Tow the Airplane with Flat Tire(s), TASK 09-10-04-580-801.

SUBTASK 09-10-00-580-009



DO NOT APPLY THE AIRPLANE BRAKES WHEN YOU TOW THE AIRPLANE WITH TOWBARLESS TOW VEHICLES. MOST TOWBARLESS TOW VEHICLES DO NOT HAVE A SHEAR PIN TO LIMIT THE LOADS IF THE AIRPLANE BRAKES ARE USED DURING TOWING. IF YOU APPLY THE BRAKES, YOU CAN APPLY LOADS TO THE NOSE LANDING GEAR THAT ARE MORE THAN THE DESIGN LOAD LIMITS. IF YOU DO NOT OBEY THIS WARNING, MAINTENANCE PERSONS CAN BE INJURED, AND DAMAGE WILL OCCUR TO THE NOSE LANDING GEAR, AND THE TOW VEHICLE.



DO NOT APPLY THE AIRPLANE BRAKES WHEN YOU TOW THE AIRPLANE WITH A TOW BAR. IF YOU USE THE AIRPLANE BRAKES WHILE YOU TOW THE AIRPLANE, YOU CAN CAUSE THE SHEAR PINS TO BREAK.



WHEN YOU USE A TOW BAR THAT DOES NOT SEPARATE WHEN THE FUSE PIN SHEARS, DO NOT USE UNCOORDINATED TRIES TO PANIC STOP THE TOW TUG AND/OR THE AIRPLANE AFTER A FUSE PIN SHEAR. THIS CAN CAUSE DYNAMIC LOADS THAT ARE MORE THAN THE INITIAL FUSE LOAD. DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (5) Only use the airplane brakes in an emergency as follows:
 - (a) With a full accumulator, you can apply the brakes approximately six times.
 - (b) If the airplane brakes were used when the airplane was towed, do this task: Phase I Inspection, TASK 05-51-01-210-801.

SUBTASK 09-10-00-580-032

- (6) If the shear pin fractures during towing, do the following steps:
 - (a) Check for any of these conditions:
 - 1) Oversteering
 - 2) Tow lug damage
 - 3) Sudden brake application
 - (b) Carefully disconnect the tow bar from the tow lug.

NOTE: The tow bar may have a force on it.

 - 1) Slowly move the tow bar as necessary to remove any force between the tow bar and the tow lug.
 - (c) If any of the conditions are found, do the following steps:

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-10-00

Page 213
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- 1) Examine the upper and lower ends of the shock strut of the nose gear for fluid leakage.
- 2) Inspect the tow lug and landing gear structure for damage.
- 3) Examine the outer cylinder of the landing gear.
- 4) Examine the nose landing gear trunnions for signs of damage.
- 5) Examine the nose landing gear trunnion attachment areas for signs of damage.
- 6) Examine the nose landing gear inner cylinder at tow fitting attach points.
- 7) Examine the doors, hinges, and retraction mechanism of the nose landing gear for signs of damage.
- 8) Examine the tow fitting and inner cylinder attachment for signs of damage.
- 9) If damage is found in any of the examinations above, do the phase II inspection (TASK 05-51-29-200-802)

(d) If none of the conditions were found, no further inspections are required.

SUBTASK 09-10-00-580-010

- (7) Complete the airplane tow in a straight line and align the disconnected torsion links a minimum of 6 ft (1829 mm).

NOTE: This procedure releases the turn forces applied to the nose gear when you tow the airplane.

SUBTASK 09-10-00-580-011

- (8) If the nose gear turning angle was more than 78 degrees, do an inspection of the nose gear (TASK 05-51-29-200-801).

SUBTASK 09-10-00-420-004

- (9) Do this task: Nose Landing Gear Torsion Link Connection, TASK 32-21-31-400-803.

SUBTASK 09-10-00-440-002

- (10) Set the parking brakes as follows:

- (a) Make sure that the pressure gage for the parking brake shows approximately 3000 psi (20,684 kPa).

NOTE: If electrical power is not available, you can verify the pressure at the gage on the brake accumulator.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 09-10-00-480-004

- (1) Install the wheel chocks on each of the main landing gears (TASK 10-11-05-500-801).

SUBTASK 09-10-00-040-002

- (2) Release the parking brake.

SUBTASK 09-10-00-080-002

- (3) Disconnect the tow bar from the tow fitting.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 214
Jan 15/2023



**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**

SUBTASK 09-10-00-080-003



WHEN YOU REMOVE THE TOWING LEVER LOCKPIN AND HYDRAULIC SYSTEM A IS PRESSURIZED, MOVE AWAY FROM THE NOSE LANDING GEAR QUICKLY. THE NOSE LANDING GEAR CAN HAVE A SUDDEN MOVEMENT. THIS CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO THE EQUIPMENT.

- (4) Remove the NLG towing lever pin, SPL-1499, and REMOVE BEFORE FLIGHT streamer, STD-3731, from the towing lever.

SUBTASK 09-10-00-580-012

- (5) Put the nose landing gear wheels in the centered position.



STAY AWAY FROM THE NOSE GEAR WHEELS WHEN THE LOCKPIN IS REMOVED. THE NOSE WHEELS CAN TURN TO THE CENTERED POSITION QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Remove the NLG towing lever pin, SPL-1499.

SUBTASK 09-10-00-860-003

- (6) Attach the static ground wires if necessary.

———— **END OF TASK** ————

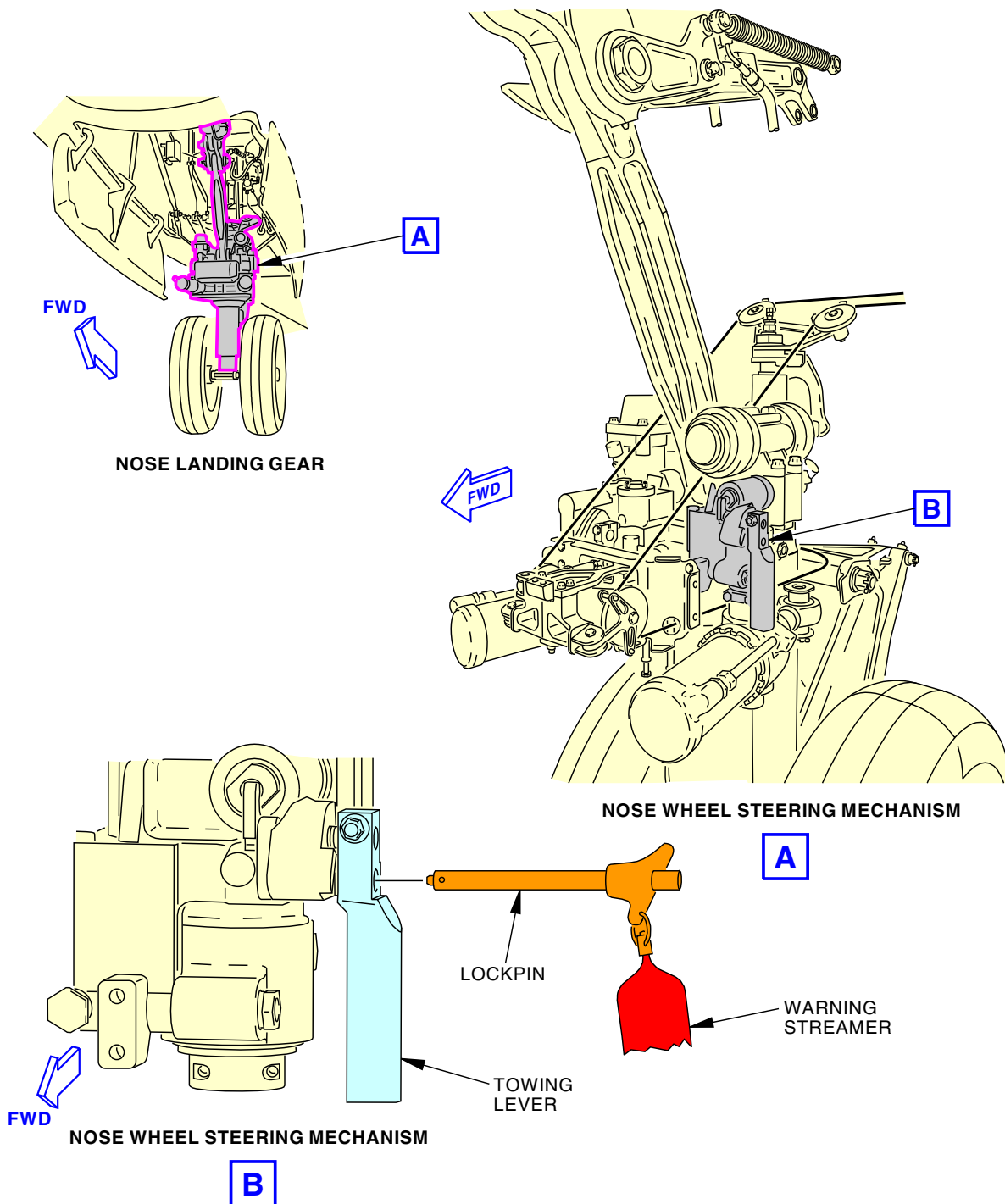
EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 215
Jan 15/2023



2471176 S0000578458_V2

Nose Gear Towing Lever Lockpin Installation
Figure 201/09-10-00-990-808

EFFECTIVITY
SIA ALL

D633AM101-SIA

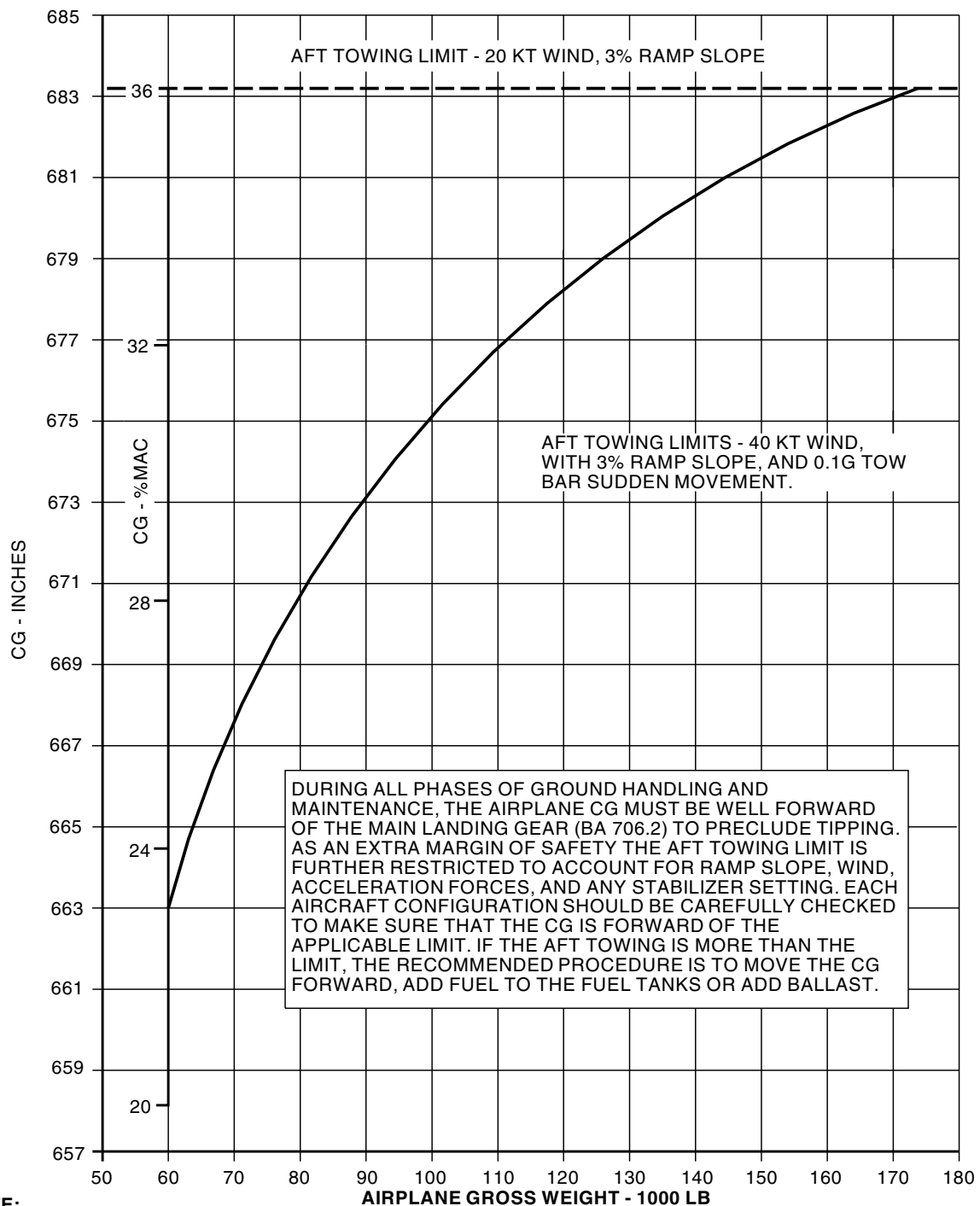
ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 216
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



NOTE:

WEIGHTS AND BALANCE ARMS ARE FROM THE AS MANUFACTURED OPERATIONAL EMPTY WEIGHT (OEW). POST DELIVERY MODIFICATIONS WILL CHANGE THE WEIGHT AND BALANCE.

2410673 S00061526118_V1

Aft CG Limits for Towing (Airplane CG Versus Gross Weight)
Figure 202/09-10-00-990-801

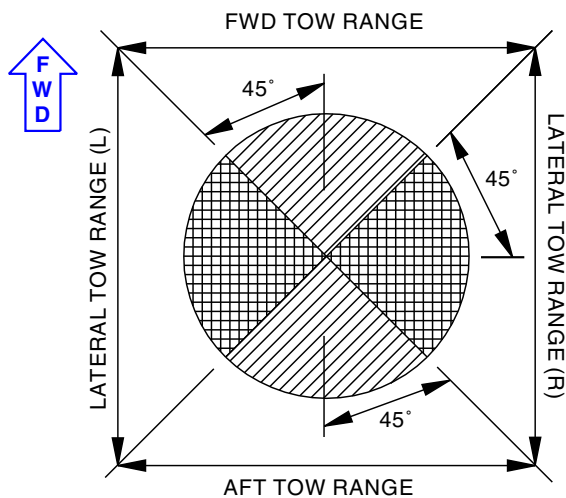
EFFECTIVITY
SIA ALL

09-10-00

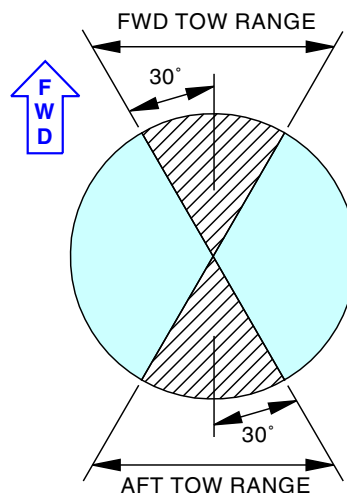
D633AM101-SIA

Page 217
Jan 15/2023

**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**



**NOSE GEAR TOWING ANGLES
(PLAN VIEW)**



**MAIN GEAR TOWING ANGLES
(PLAN VIEW)**

MODEL	MAXIMUM TAXI GROSS WEIGHT LB (kg)	NOSE LANDING GEAR LOAD LB (kg)			MAIN LANDING GEAR LOAD LB (kg) (EACH)	
		FWD (±45°)	AFT (180 ±45°)	LATERAL (±90° ±45°)	FWD (±30°)	AFT (180 ±30°)
737-8, BBJ	182,700 (82,871)	27,405 (12,431)	27,405 (12,431)	13,703 (6,216)	20,554 (9,323)	20,554 (9,323)

NOTE:

0° = AIRPLANE FORWARD DIRECTION.

MAXIMUM TOWING LOADS

NOTE:

- THE MAXIMUM ANGLE TO TOW AND STEER FOR PUSHBACK IS 75 DEGREES.
- NOSE GEAR TOW ANGLES MORE THAN 78 DEGREES, DISCONNECT THE TORSION LINKS.
- TOWBARLESS TOW LOADS ARE 80% OF THE ABOVE VALUES.

2922077 S0000704305_V1

**Airplane Towing Loads and Turning Radius
Figure 203/09-10-00-990-803**

EFFECTIVITY
SIA ALL

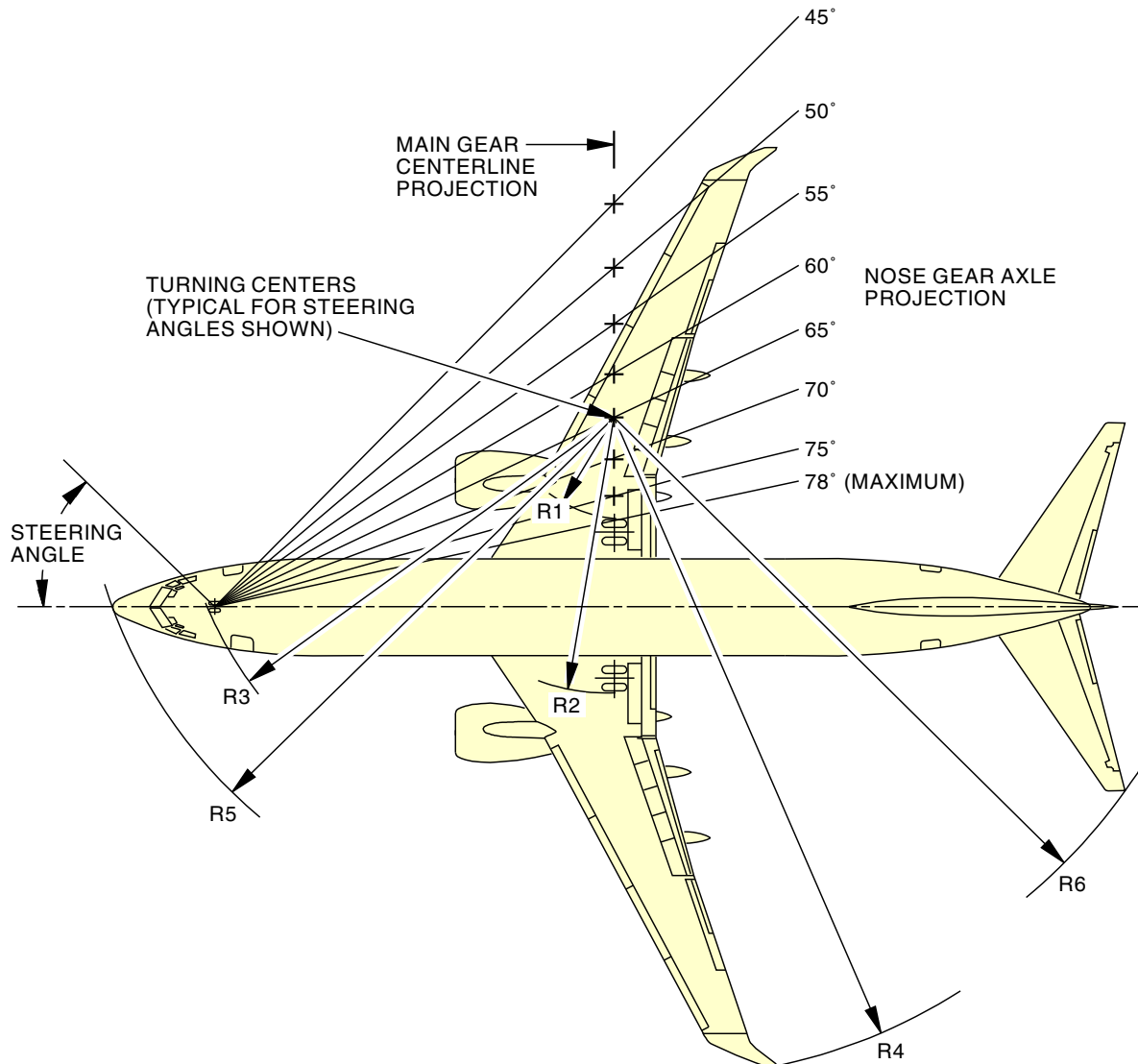
09-10-00

D633AM101-SIA

Page 218
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



NOTE:

- THE CORRECT TURNING RADII CAN BE GREATER THAN SHOWN.
- THE WINGTIP RADII (R4) TURNS SHOWN ARE SIMULATED AND DO NOT INCLUDE THE TIRE SCUFFS OR THE FRICTION DURING TURNS. THE CORRECT RADII (R4) WILL BE LARGER.
- THE DIMENSIONS SHOWN ARE TO THE NEAREST FOOT AND 0.1 METER.

2410677 S00061526122_V1

Airplane Turning Radii - No Slip Angle
Figure 204/09-10-00-990-804 (Sheet 1 of 2)

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 219
Jan 15/2023



**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**

STEERING ANGLE (DEGREES)	R1 INNER GEAR		R2 OUTER GEAR		R3 NOSE GEAR		R4 WING TIP		R5 NOSE		R6 TAIL	
	FT	M	FT	M	FT	M	FT	M	FT	M	FT	M
30	76.9	23.4	100.0	30.5	102.7	31.3	149.1	45.4	109.5	33.4	129.5	39.5
35	61.4	18.7	84.5	25.8	89.6	27.3	133.6	40.7	97.4	29.7	116.4	35.5
40	49.3	15.0	72.4	22.1	80.1	24.4	121.6	37.1	88.7	27.0	106.6	32.5
45	39.5	12.0	62.6	19.1	72.9	22.2	111.9	34.1	82.3	25.1	99.0	30.2
50	18.2	9.5	54.4	16.6	67.4	20.6	103.8	31.6	77.4	23.6	93.0	28.3
55	24.2	7.4	47.3	14.4	63.2	19.3	96.8	29.5	73.8	22.5	88.0	26.8
60	17.9	5.3	41.0	12.5	59.8	18.3	90.6	27.6	70.9	21.6	83.9	25.6
65	12.3	3.7	35.4	10.8	57.3	17.5	85.1	25.9	68.8	21.0	80.4	24.5
70	7.0	2.1	30.1	9.2	55.3	16.9	80.0	24.4	67.1	20.5	77.5	23.6
78 MAXIMUM	-0.7	-0.2	22.4	6.8	53.2	16.2	72.5	22.1	65.4	19.9	73.6	22.4

2410678 S00061526123_V1

**Airplane Turning Radii - No Slip Angle
Figure 204/09-10-00-990-804 (Sheet 2 of 2)**

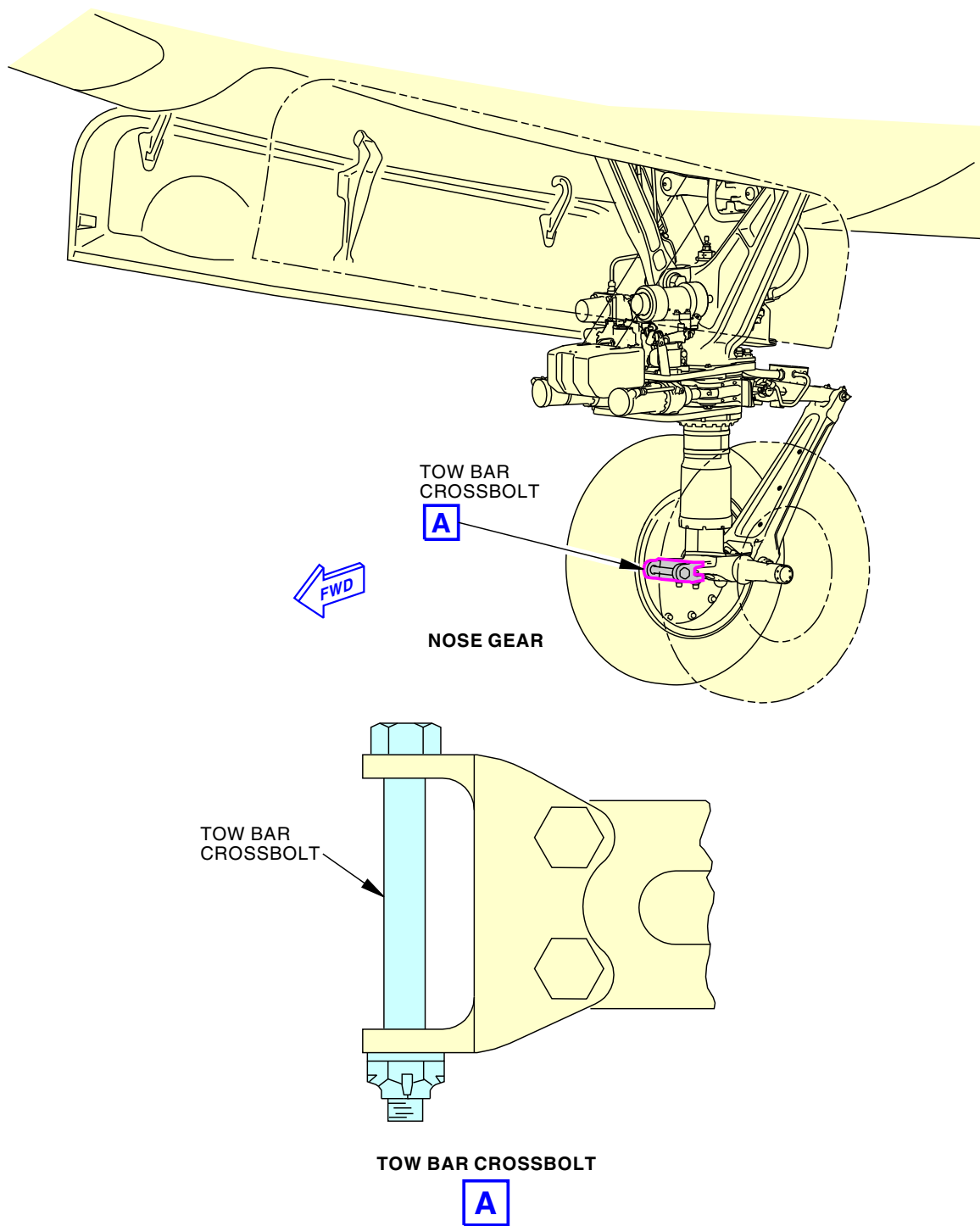
EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 220
Jan 15/2023

ECCN 9E991 BOEING PROPRIETARY - See title page for details



2410679 S00061526124_V2

Nose Gear Tow Bar Fitting and Crossbolt Attach Points
Figure 205/09-10-00-990-805

EFFECTIVITY
SIA ALL

D633AM101-SIA

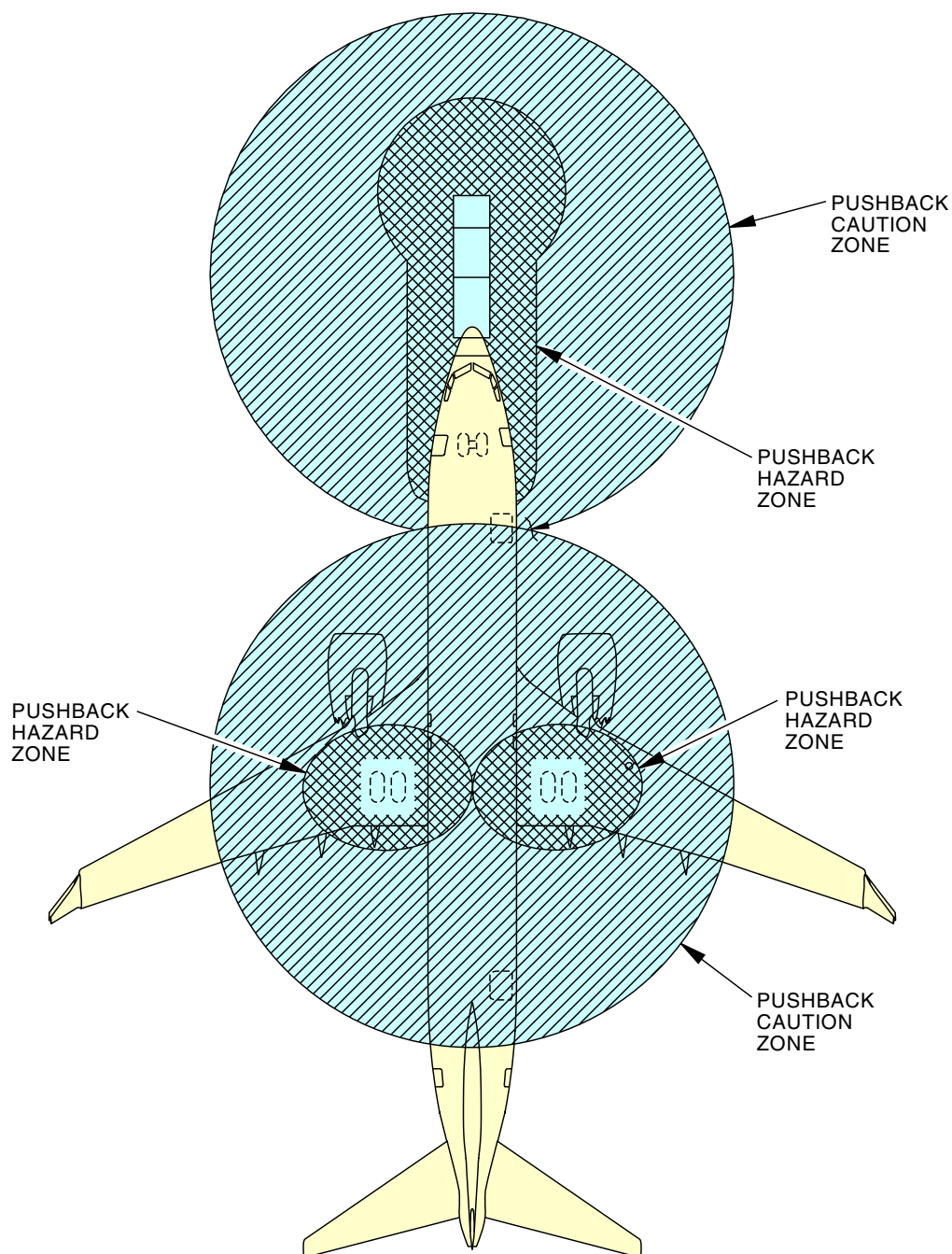
ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 221
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



WARNING:

KEEP A MINIMUM OF 10 FEET (3 METERS) SEPARATION BETWEEN THE PERSONNEL ON THE GROUND, NOSE WHEELS, TOW BAR AND TOW VEHICLE, AND THE MAIN WHEELS WHEN THE AIRPLANE IS MOVING.

2410681 S00061526126_V2

Airplane Towing Pushback Hazard Zones
Figure 206/09-10-00-990-807

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 222
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

TASK 09-10-00-580-802

3. Main Gear Maintenance Towing

A. General

- (1) This task gives the instructions to tow the airplane from the main landing gear for unusual conditions.
- (2) Make sure that you read the General statement at the start of this procedure. To tow the airplane correctly, you must know these cautions and procedures:
 - (a) Tow Safety
 - (b) Communications
 - (c) Tow the Airplane
- (3) You can tow or winch the airplane if the landing gear is safe and usable. When you winch the airplane it lets you control the airplane movements more easily than towing. Winching also provides more force to move the airplane.
- (4) There are tow lugs on each of the main gears.
- (5) Use a wire rope cable or correct slings between the airplane and the tow vehicles or the winch. The cable must have the correct fittings and cable diameters for the airplane load. Use a load indicator device between the gear and the cable to prevent damage to the gear. Install rope bridge between the cables each 15 ft (5 m) to stop sudden movements if a link or a cable breaks.
- (6) The airplane can move forward or aft with a tow vehicle or a winch. When the airplane starts to move, continue to keep a slow and smooth force in a straight line. If you must turn the airplane, use the largest radius that you can.
- (7) When the airplane is on a hard surface the airplane can have a faster movement than the tow vehicle and hit it. Use a rear vehicle with a restraint cable that will hold the airplane in a stable condition while it moves.
- (8) Be careful when you use more than one vehicle to tow the airplane. The vehicles must use the same straight line to prevent an unusual movement that is not symmetrical on the two landing gears.
- (9) When a trailer is used below the nose of the fuselage, it must have a turntable (swivel cradle) that lets the trailer turn when you tow the airplane, if necessary.

B. References

Reference	Title
10-11-05-500-801	Chock Installation Winds/Gusts Maximum 40 mph (35 Knots) (P/B 201)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-41-610-802	Nose Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-51-780-801	Landing Gear Tire Pressure Check and Tire Servicing (P/B 301)
24-22-00-860-805	Supply APU Generator Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-802-G00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-801-G00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 223
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1498	Eyebolt - Towing, Main Gear Part #: F72719-12 Supplier: 81205 Opt Part #: F72719-500 Supplier: 81205

D. Location Zones

Zone	Area
700	Landing Gear and Landing Gear Doors

E. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

F. Prepare to Tow the Airplane

SUBTASK 09-10-00-910-002



ALL WORK AROUND THE AIRPLANE MUST STOP WHEN LIGHTNING OCCURS AT A DISTANCE OF 6 MILES (10 KILOMETERS) OR LESS. ALL PERSONNEL MUST GO IN A BUILDING OR THE AIRPLANE. LIGHTNING CAN KILL PERSONNEL OR CAUSE INJURY.

- (1) Make sure that the weather condition is suitable for the towing operation.

SUBTASK 09-10-00-080-011



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED. WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (2) Remove the tail stand.

SUBTASK 09-10-00-480-005

- (3) Install the wheel chocks (TASK 10-11-05-500-801).

SUBTASK 09-10-00-440-003

- (4) Set the parking brakes.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 224
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-410-007



WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Do these tasks in sequence to safely close the applicable left or right thrust reversers:
- (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-802-G00.
- 1) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|---------------------------------|
| 415 | Left Thrust Reverser, Engine 1 |
| 416 | Right Thrust Reverser, Engine 1 |
| 425 | Left Thrust Reverser, Engine 2 |
| 426 | Right Thrust Reverser, Engine 2 |
- (b) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.
- 1) Close these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|--------------------------|
| 413 | Left Fan Cowl, Engine 1 |
| 414 | Right Fan Cowl, Engine 1 |
| 423 | Left Fan Cowl, Engine 2 |
| 424 | Right Fan Cowl, Engine 2 |
- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-801-G00.

SUBTASK 09-10-00-560-005

- (6) Put an approved brake operator in the flight compartment.
- (a) Adjust the captain seat if necessary to reach the airplane brakes.
- NOTE: Use the handhold above the forward window as aid when pulling the seat forward. Do not use the glare shield because damage can occur.

SUBTASK 09-10-00-560-006



WARNING

DO NOT CONNECT A HEADSET, OR TOUCH CONNECTIONS TO THE AIRPLANE WHEN THERE IS LIGHTNING, OR IN STRONG ELECTROMAGNETIC FIELDS. LIGHTNING, AND ELECTRICAL CURRENT CAN CAUSE INJURIES TO PERSONNEL.



WARNING

MAKE SURE THAT THE TOW TRACTOR OPERATOR, THE GROUND CREW, AND THE FLIGHT COMPARTMENT CREW CAN SPEAK TO THE OTHERS. IF THEY CAN NOT SPEAK TO THE OTHERS, AIRPLANE MOVEMENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO THE EQUIPMENT.

- (7) Position the flight compartment crew, the tow vehicle operators, and the ground crew to where they can see and communicate each other.

SUBTASK 09-10-00-420-005

- (8) Install the landing gear downlock pins on the nose and main landing gear (TASK 32-00-01-480-801).

NOTE: It is optional to install the landing gear downlock pins when you tow or push the airplane for taxi and departure.

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-10-00

Page 225
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-480-007

- (9) Install the eyebolt, SPL-1498, spacer, and nut in the hole on the bottom of each main landing gear oleo.

NOTE: The eyebolt fitting bolt position can be installed in the forward or aft side of the oleo lug for forward or backward towing.

SUBTASK 09-10-00-610-003



DO NOT TOW THE AIRPLANE WITH A FULLY COMPRESSED LANDING GEAR SHOCK STRUT. IF YOU TOW THE AIRPLANE WITH A FULLY COMPRESSED SHOCK STRUT, DAMAGE TO THE AIRPLANE CAN OCCUR.

- (10) Make sure that the landing gear shock struts have the correct extension to tow the airplane as follows:

NOTE: The main landing gear shock struts are deflated when the dimension "X" is below the servicing band. The landing gear shock struts are fully compressed when dimension "X" is equal to 0.9 in. (2.3 cm) on the main landing gear.

- (a) Refer to the servicing chart in the wheel well to check for the minimum main gear shock strut extension for towing.

SUBTASK 09-10-00-610-006

- (11) If it is necessary, service the landing gear shock struts (TASK 12-15-41-610-802 and TASK 12-15-31-610-802).

SUBTASK 09-10-00-610-004

- (12) Make sure that the landing gear tires have the correct tire pressure (TASK 12-15-51-780-801).

SUBTASK 09-10-00-860-004

- (13) Do this task: Supply APU Generator Power, TASK 24-22-00-860-805.

SUBTASK 09-10-00-210-003

- (14) Make sure that the STBY power switch on the P5 panel is in the AUTO position.

SUBTASK 09-10-00-860-005

- (15) Supply hydraulic power to hydraulic system B (TASK 29-11-00-860-801).

SUBTASK 09-10-00-860-008

- (16) If hydraulic system B is not used or is not operational, do this step:
- (a) Make sure that the hydraulic brake accumulator pressure is approximately 3000 psi (20,684 kPa).

NOTE: To tow the airplane with brakes that operate, the brake accumulator must have approximately 3000 psi (20,684 kPa). You can apply the brakes two to six times when the brake accumulator pressure is approximately 3000 psi (20,684 kPa).

NOTE: If electrical power is not available, you can verify the pressure at the gage on the brake accumulator.

SUBTASK 09-10-00-280-003

- (17) If it is necessary, adjust the lateral fuel imbalance for the No. 1 and No. 2 main fuel tanks.

NOTE: When an airplane is moved with a lateral fuel imbalance that is more than the limits while on the ground, a structural inspection is not required. This is permitted only if taxi procedures were followed, the maximum taxi speed was below 29 mph (25 knots) and no maximum or hard braking occurred. If these limitations were exceeded, a structural inspection is required. Contact Engineering for a specific bill of work.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 226
Jan 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-580-013

- (18) Make sure that the airplane gross weight and the center of gravity are within the permitted limits (Figure 202).

SUBTASK 09-10-00-970-002

- (19) If components are moved, added to or removed from the airplane, refer to the table below to show the shift in the weight and CG changes.

Table 203/09-10-00-993-802 Weight and Center of Gravity Changes

SHIFTS	WEIGHT		CENTER OF GRAVITY (CG)	MOMENT WEIGHT X BALANCE ARM ^[1]	
				(LB) 75,000	(BA) 678
	LB	KG	BALANCE ARM (BA)	IN.	%MAC
ONE MAN IN PILOT'S SEAT	200	90.7	32	-1.6	-1.0
ONE MAN IN CABIN AT BS 990	200	90.7	1202	1.3	0.8
1000 LB ATTACH TO THE NOSE GEAR	100	453.6	93	-7.3	-4.7
1000 LB LOADED IN THE FWD CARGO HOLD AT (CENTEROID)	100	453.6	360.7	-4.0	-2.6
ONE ENGINE REMOVED ^[2]	10643	4828	551.5	13.6	8.7
TWO ENGINES REMOVED ^[2]	21286	9656	551.2	30.4	19.5
FUEL IN THE WING TANKS (7.1 LB/GAL)	2500	1134.0	657.3	-8.0	-0.5
	5000	2268.0	660.24	-1.3	-0.9
	7500	3401.9	663.49	-1.7	-1.1
	10,000	4535.9	668.58	-1.6	-1.0
	12,500	5669.9	675.88	-1.0	-0.6
	15,000	6803.9	684.93	0.3	0.2
	17,500	7937.9	696.06	2.3	1.5
	18,289	8294.8	700.71	3.3	2.1

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 227
Jan 15/2023



**737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL**

Table 203/09-10-00-993-802 Weight and Center of Gravity Changes (Continued)

SHIFTS	WEIGHT		CENTER OF GRAVITY (CG)	MOMENT WEIGHT X BALANCE ARM ^{*[1]}	
				(LB) 75,000	(BA) 678
	LB	KG	BALANCE ARM (BA)	IN.	%MAC
FUEL IN THE CENTER TANK (7.1 LB/GAL)	2500	1134.0	607.95	-2.3	-1.5
	5000	2268.0	605.22	-4.6	-2.9
	7500	3401.9	604.75	-6.7	-4.3
	10,000	4535.9	604.85	-8.7	-5.6
	12,500	5669.9	605.22	-10.5	-6.7
	15,000	6803.9	605.71	12.2	-7.8
	17,500	7937.9	606.13	-13.8	-8.9
	20,000	9071.8	606.46	-15.3	-9.8
	22,500	10,205.8	606.69	-16.8	-10.8
	25,000	11,339.8	606.74	-18.2	-11.7
	27,500	12,473.8	606.38	-19.6	-12.6
	30,000	13,607.8	605.59	-21.1	-13.5
	30,523	13,845.0	605.39	-21.4	-13.8

*[1] The airplane configuration must be examined to make sure that the center of gravity (CG) is forward of the applicable limit. If the aft towing is more than the limit, move the center of gravity forward, add fuel or ballast. The table shows the effect that some components have on the CG location of the airplane. A forward shift will show as a minus (-) sign.

*[2] See table below.

Table 204/09-10-00-993-805

737MAX	One Engine	Two Engines
Engine (Dry)	6009 lb (2726 kg)	12018 lb (5452 kg)
Ready For Installation (RFI) Engine	7260 lb (3293 kg)	14520 lb (6586 kg)
Total Propulsion System	10643 lb (4828 kg)	21286 lb (9656 kg)

Note: Source extracted from the Boeing Engine Ground Handling (D626AM003)

Engine (Dry): Assembled engine as furnished by the engine manufacturer that w/o Inlet, Engine Mounts, Thrust Links, Generator, Fuel Pump, Nozzle, Plug and Engine Build-Up (EBU) System

EBU System: Electrical + Pneumatic and Hydraulic Lines + Fuel Pump + Hydraulic Pump + Starter Valve

RFI Weight: Engine (Dry) + Engine Mounts (FWD & AFT) + Thrust Links + Inlet + Nozzle + Exhaust Plug + Integrated Drive Generator (IDG) and Quick Access Disconnect (QAD) + EBU System + Engine Fluids

Total Propulsion Weight: RFI Weight + Fan Cowls (both engines) + Thrust Reverser Ducts + Strut Structure + Systems + Precooler + Equipment Install (Strut to Wing) + AFT Strut Fairings + Strut Wing Attach Links + Strut to Wing Fairings

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 228
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

Table 204/09-10-00-993-805 (Continued)

737MAX	One Engine	Two Engines
Weight Tolerance $\pm 1.0\%$		

SUBTASK 09-10-00-580-015

- (20) Make sure that the maximum tow angles and loads will not be more than the permitted limits (Figure 203).

NOTE: Towing trials have shown that during normal towing operations, including breakaway, turning and smooth stopping, loads do not exceed the maximum permitted tow loads for the landing gear.

NOTE: Normal towing is defined as a smooth breakaway push/pull and stop of the airplane with the nose wheel in a straight position. Towing start and stop with the nose wheel at an angle can cause the loads to exceed the maximum permitted tow loads for the landing gear.

SUBTASK 09-10-00-410-004

- (21) Make sure that the electronic compartment access door is closed.

SUBTASK 09-10-00-020-002

- (22) Remove the airplane static ground wires.

SUBTASK 09-10-00-080-004



WHEN YOU TOW THE AIRPLANE, STAY OUT OF THE DANGEROUS AREAS AROUND THE TOW VEHICLE, TOW BAR, AND AIRPLANE TIRES. IT IS POSSIBLE FOR THE TIRES AND EQUIPMENT TO PULL YOU BELOW THEM WHILE THE AIRPLANE CHANGES POSITIONS AND DIRECTIONS. IF YOU DO NOT KEEP THIS SEPARATION, INJURY TO PERSONNEL CAN OCCUR.

- (23) Make sure that the ramp area is clear of all stands and equipment in the towing path.

SUBTASK 09-10-00-560-008

- (24) Put the tow vehicles in position.

SUBTASK 09-10-00-580-016

- (25) Locally make a wire cable 0.75 in. (19.05 mm) with end fittings that will correctly attach to the eyebolt, SPL-1498.

NOTE: The cables must have the applicable fittings and cable diameters that are necessary for the weight of the airplane. Use load indicating devices between the gear and the cable to prevent damage to the main gear.

SUBTASK 09-10-00-580-017

- (26) Attach the cables to the eyebolt, SPL-1498 on each main gear and the tow vehicles.

NOTE: For forward towing, the lower brake temperature monitoring system (BTMS) or Tire Pressure Indicating System (TPIS) conduit may have to be repositioned to prevent cable interference.

SUBTASK 09-10-00-280-004

- (27) Pressurize hydraulic system A (TASK 29-11-00-860-801).

SUBTASK 09-10-00-080-005

- (28) Remove the wheel chocks.

SUBTASK 09-10-00-040-003

- (29) Release the parking brakes.

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-10-00

Page 229
May 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

G. Main Landing Gear Towing Procedure

SUBTASK 09-10-00-560-009



GROUND PERSONNEL ARE PROHIBITED FROM ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING. MAINTAIN MINIMUM OF 10 FT (3 M) AWAY FROM LANDING GEAR, TOWBAR, AND TOW TRACTOR. ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING CAN CAUSE INJURY OR DEATH TO PERSONNEL.

- (1) Keep all persons and operators away from the pushback hazard zones (Figure 206).

SUBTASK 09-10-00-580-018



MAKE SURE THAT YOU PUT THE TOWING LEVER IN THE TOW POSITION BEFORE YOU TOW THE AIRPLANE. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO LANDING GEAR COMPONENTS OR THE TOWING EQUIPMENT.

- (2) Start the towing operation with a slow and smooth movement.
NOTE: You can use the wheel chocks to prevent a rollback, if necessary.
NOTE: The entry or lower cargo doors can be open when you tow the airplane.
 - (a) Increase the cable forces on the airplane slowly until the airplane moves.
 - (b) Keep control of the airplane when you tow on a hard surface.
NOTE: The airplane can have a faster movement than the tow vehicles. Use a rear vehicle with a restraint cable to maintain control of the airplane forward movement.
 - (c) If you use a trailer below the nose of the fuselage, make sure that it has a turntable (swivel cradle).
 - (d) Make sure that you use the largest radius to make turns when possible.

SUBTASK 09-10-00-580-019

- (3) Keep the brake applications to a minimum.
NOTE: The tow vehicles will be used to move and steer the airplane.
NOTE: The number of brake applications is not limited when the hydraulic systems are operational.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 09-10-00-580-020

- (1) If possible, put the nose landing gear wheels in the centered position.

SUBTASK 09-10-00-480-009

- (2) Install the wheel chocks.
 - (a) Do this task: Chock Installation Winds/Gusts Maximum 40 mph (35 Knots), TASK 10-11-05-500-801.

SUBTASK 09-10-00-040-004

- (3) Set the parking brakes.

SUBTASK 09-10-00-860-007

- (4) Attach the static ground wires if necessary.

————— END OF TASK —————

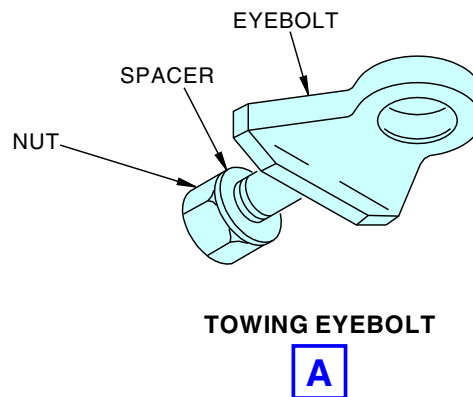
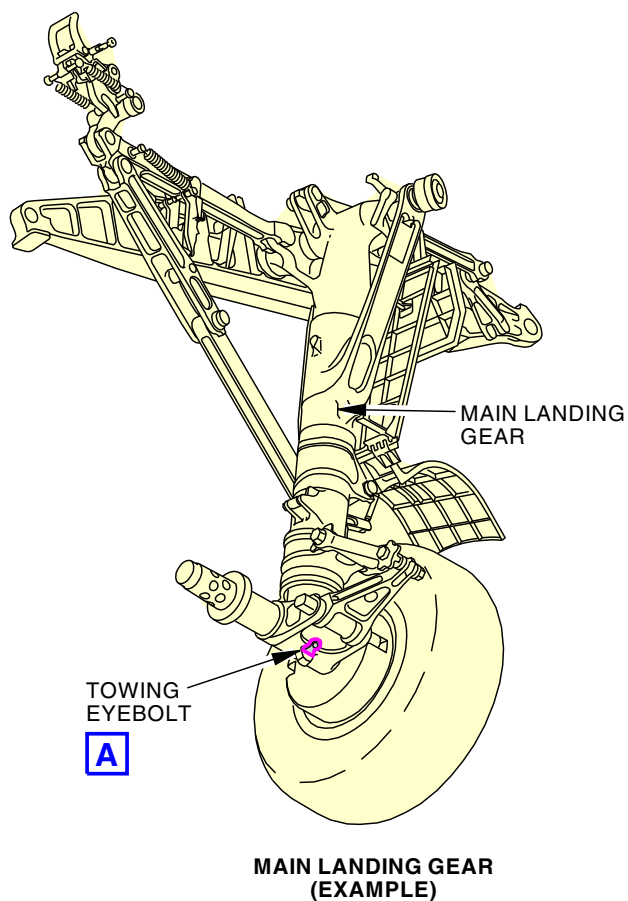
EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 230
Jan 15/2023



2471906 S0000578467_V1

Main Landing Gear Towing Eyebolt Installation
Figure 207/09-10-00-990-809

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 231
Jan 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

TASK 09-10-00-580-803

4. **Pushback Towing**

A. General

- (1) This task gives the instructions for pushback operations. Use this task to make specified procedures for customer requirements.
- (2) Make sure that you read the General statement at the start of this procedure. To tow the airplane correctly, you must know these cautions and procedures:
 - (a) Tow Safety
 - (b) Communications
 - (c) Tow the Airplane

B. References

Reference	Title
05-51-01-210-801	Phase I Inspection (P/B 201)
05-51-29-200-801	Phase I Inspection (P/B 201)
05-51-29-200-802	Phase II Inspection (P/B 201)
09-10-04-580-801	Tow the Airplane with Flat Tire(s) (P/B 201)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-41-610-802	Nose Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-21-31-000-803	Nose Landing Gear Torsion Link Disconnection (P/B 401)
32-21-31-400-803	Nose Landing Gear Torsion Link Connection (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-959	Tractor - Towbarless (TLTV) Part #: AP8950SDB-AL-200 Supplier: 58742 Part #: EXPEDITER 160 Supplier: 93408 Part #: EXPEDITER 310 Supplier: 93408 Part #: GTL160 Supplier: SW482 Part #: GTL300 Supplier: SW482 Part #: Spacer 8600 Supplier: 6X2T Part #: TBL-280 Supplier: AN46N Part #: TPX-200-MT Supplier: 6L481 Part #: TPX-200-MTS Supplier: 6L481

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-10-00

Page 232
Sep 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

(Continued)

Reference	Description
COM-1500	Towbar - Airplane, Towing and Steering Part #: 01-1246-0010 Supplier: 59603 Part #: 15F2716 Supplier: 56535 Part #: 15F2930 Supplier: 56535 Part #: 15F3164 Supplier: 56535 Part #: 15F3340 Supplier: 56535 Part #: 1793.00 Supplier: 1777B Part #: 200470-1 Supplier: 9M323 Part #: 200470-5 Supplier: 9M323 Part #: 300460-737Q Supplier: 9M323 Part #: F794 Supplier: 56535 Part #: FIL11060 Supplier: \$1341 Part #: J-TOW737-C Supplier: CD856 Part #: Model 15F3340 Supplier: 56535 Part #: PF09-009-1 Supplier: 3D5B2 Part #: TOUNIV3S Supplier: D2029 Part #: TOWB737S Supplier: D2029 Opt Part #: 15F1295 Supplier: 56535 Opt Part #: 794 Supplier: 56535 Opt Part #: TOWB737-C Supplier: D2029
SPL-1499	Pin - Lock, NLG Towing Lever Part #: A09003-2 Supplier: 81205 Opt Part #: A09003-1 Supplier: 81205
STD-3731	Streamer - REMOVE BEFORE FLIGHT

D. Prepare for the Pushback Towing

SUBTASK 09-10-00-080-012



DO NOT TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED. WHEN YOU TOW THE AIRPLANE WHILE THE TAIL STAND IS INSTALLED, IT CAN CAUSE DAMAGE TO EQUIPMENT.



DO NOT DEFLATE OR SERVICE THE SHOCK STRUTS WHILE THE TAIL STAND IS INSTALLED. IF YOU DEFLATE OR SERVICE THE SHOCK STRUTS, THE LOAD ON THE TAIL STAND CAN BE TOO LARGE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Remove the tail stand.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 233
Sep 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-280-005



DO NOT REFUEL THE AIRPLANE WHEN YOU SEE LIGHTNING, OR THERE IS HIGH ATMOSPHERIC ELECTRICAL ACTIVITY. STOP THE REFUEL OPERATION IF YOU SEE LIGHTNING. DO NOT CONNECT A HEADSET. DO NOT TOUCH ELECTRICAL CONNECTIONS TO THE AIRPLANE. LIGHTNING STRIKES CAN CAUSE INJURIES TO PERSONNEL, A FIRE, OR AN EXPLOSION.

- (2) If it is necessary, adjust the lateral fuel imbalance for the No. 1 and No. 2 main fuel tanks.

NOTE: When an airplane is moved with a lateral fuel imbalance that is more than the limits while on the ground, a structural inspection is not required. This is permitted only if taxi procedures were followed, the maximum taxi speed was below 29 mph (25 knots) and no maximum or hard braking occurred. If these limitations were exceeded, a structural inspection is required. Contact Engineering for a specific bill of work.

SUBTASK 09-10-00-560-013

- (3) Put an approved brake operator in the flight compartment.

- (a) Adjust the captain seat if necessary to reach the airplane brakes.

NOTE: Use the handhold above the forward window as aid when pulling the seat forward. Do not use the glare shield because damage can occur.

SUBTASK 09-10-00-560-011



DO NOT CONNECT A HEADSET, OR TOUCH CONNECTIONS TO THE AIRPLANE WHEN THERE IS LIGHTNING, OR IN STRONG ELECTROMAGNETIC FIELDS. LIGHTNING, AND ELECTRICAL CURRENT CAN CAUSE INJURIES TO PERSONNEL.



MAKE SURE THAT THE TOW TRACTOR OPERATOR, THE GROUND CREW, AND THE FLIGHT COMPARTMENT CREW CAN SPEAK TO THE OTHERS. IF THEY CAN NOT SPEAK TO THE OTHERS, AIRPLANE MOVEMENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO THE EQUIPMENT.

- (4) Position the flight compartment crew, the tow tractor operator, and the ground crew to where they can see and communicate each other.

SUBTASK 09-10-00-480-010



WHEN YOU USE A TOW BAR TO MOVE THE AIRPLANE IN HIGH WINDS, CONNECT THE TOW BAR BEFORE YOU INSERT THE TOWING LEVER LOCKPIN (NLG TOWING LEVER PIN). THE AIRPLANE COULD MOVE AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



ONLY USE THE CORRECT PIN FOR THE AIRPLANE MODEL. IF YOU USE AN INCORRECT PIN, THE HYDRAULIC STEERING CAN OPERATE. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (5) Install the nose gear steering lockout pin as follows (Figure 201):

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 234
May 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



MAKE SURE THAT YOU PUT THE TOWING LEVER IN THE TOW POSITION BEFORE YOU TOW THE AIRPLANE. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO LANDING GEAR COMPONENTS OR THE TOWING EQUIPMENT.

- (a) Move the towing lever forward to the tow position.

NOTE: The towing lever is at the left forward side of the steering metering valve that is spring-loaded in the off position. A placard installed on the cover shows which direction to put the two lever, TOW POSITION or NORMAL POSITION.



IF THE NOSE GEAR STEERING LOCKOUT PIN IS NOT INSTALLED, MAKE SURE THAT THE PRESSURE IN HYDRAULIC SYSTEM A IS COMPLETELY REMOVED BEFORE TOWING THE AIRPLANE. IF YOU DO NOT OBEY THIS WARNING, YOU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE STEERING COMPONENTS.

- (b) Install the NLG towing lever pin, SPL-1499, with a REMOVE BEFORE FLIGHT streamer, STD-3731, in the pin hole in the lever to hold the lever in the towing position (Figure 201).

SUBTASK 09-10-00-480-011

- (6) Install the landing gear downlock pins on the nose and main landing gear (TASK 32-00-01-480-801).

NOTE: It is optional to install the landing gear downlock pins when you tow or push the airplane for taxi and departure.

SUBTASK 09-10-00-610-005



DO NOT TOW THE AIRPLANE WITH A FULLY COMPRESSED LANDING GEAR SHOCK STRUT. IF YOU TOW THE AIRPLANE WITH A FULLY COMPRESSED SHOCK STRUT, DAMAGE TO THE AIRPLANE CAN OCCUR.

- (7) Make sure that the landing gear shock struts have the correct extension as follows:

NOTE: The nose landing gear and main landing gear shock struts are deflated when the dimension "X" is below the servicing band. The landing gear shock struts are fully compressed when dimension "X" is equal to 13.8 in. (35.1 cm) on the nose landing gear and 0.9 in. (2.3 cm) on the main landing gear.

- (a) Refer to the servicing chart in the wheel well to check for the minimum main gear shock strut extension for towing.

SUBTASK 09-10-00-610-007

- (8) If it is necessary, service the landing gear shock struts (TASK 12-15-41-610-802 and TASK 12-15-31-610-802).

SUBTASK 09-10-00-580-021

- (9) Make sure that the airplane center of gravity is within the towing limits (Figure 202).

SUBTASK 09-10-00-020-003

- (10) If the nose gear angle will exceed the maximum 78 degrees, do these steps (Figure 204):

NOTE: A red stripe is painted on the outside of each nose landing gear door. When the tow bar aligns with the red stripe, the wheels are at 78 degrees.

- (a) Disconnect the torsion links (TASK 32-21-31-000-803).

NOTE: The nose gear steering will not operate.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 235
May 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

- (b) Use a rope to hold the torsion links to prevent damage to the links when you tow the airplane.

SUBTASK 09-10-00-560-012

- (11) Put the tow vehicle in position.

SUBTASK 09-10-00-480-012

- (12) If you will use a towbar, COM-1500, attach the towbar to the nose landing gear tow fitting as follows:

- (a) Make sure that you install the correct shear pins.

SUBTASK 09-10-00-480-014

- (13) If you will use a towbarless tow tractor, COM-959, attach the tractor to the airplane.

SUBTASK 09-10-00-040-005

- (14) Remove the wheel chocks.

SUBTASK 09-10-00-040-006

- (15) Release the parking brakes.

SUBTASK 09-10-00-580-022



WHEN YOU TOW THE AIRPLANE, STAY OUT OF THE DANGEROUS AREAS AROUND THE TOW VEHICLE, TOW BAR, AND AIRPLANE TIRES. IT IS POSSIBLE FOR THE TIRES AND EQUIPMENT TO PULL YOU BELOW THEM WHILE THE AIRPLANE CHANGES POSITIONS AND DIRECTIONS. IF YOU DO NOT KEEP THIS SEPARATION, INJURY TO PERSONNEL CAN OCCUR.

- (16) Make sure that the ramp area is clear of all stands and equipment in the towing path.

E. Pushback Towing

SUBTASK 09-10-00-580-023



DO NOT HOLD OR TURN THE TILLER FOR THE NOSE WHEEL STEERING WHILE YOU TOW THE AIRPLANE. IF YOU HOLD OR TURN THE TILLER, DAMAGE TO THE NOSE WHEEL STEERING SYSTEM CAN OCCUR.

- (1) Make sure that the maximum tow loads are within the permitted limits (Figure 203).

NOTE: Towing trials have shown that during normal towing operations, including breakaway, turning and smooth stopping, loads do not exceed the maximum permitted tow loads for the landing gear.

NOTE: Normal towing is defined as a smooth breakaway push/pull and stop of the airplane with the nose wheel in a straight position. Towing start and stop with the nose wheel at an angle can cause the loads to exceed the maximum permitted tow loads for the landing gear.

SUBTASK 09-10-00-580-024



GROUND PERSONNEL ARE PROHIBITED FROM ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING. MAINTAIN MINIMUM OF 10 FT (3 M) AWAY FROM LANDING GEAR, TOWBAR, AND TOW TRACTOR. ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING CAN CAUSE INJURY OR DEATH TO PERSONNEL.

- (2) Keep all persons and operators away from the pushback hazard zones (Figure 206).

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 236
May 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-080-006

- (3) Remove the wheel chocks.

SUBTASK 09-10-00-580-025

- (4) Start the pushback with a slow and smooth breakaway.

SUBTASK 09-10-00-580-026



MAKE SURE THAT YOU PUT THE TOWING LEVER IN THE TOW POSITION BEFORE YOU TOW THE AIRPLANE. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO LANDING GEAR COMPONENTS OR THE TOWING EQUIPMENT.

- (5) Start the towing operation with a slow and smooth movement.

NOTE: The entry or lower cargo doors can be open when you tow the airplane.



OBEY THESE PRECAUTIONS. IF YOU IGNORE THESE PRECAUTIONS, DAMAGE TO EQUIPMENT WILL OCCUR.

- (a) Move the airplane forward before you start to make sharp turns.
- (b) Make sure that you do not make sudden starts or stops.
- (c) When the airplane is towed during unusual conditions, refer to the applicable task.
 - 1) High winds, do this task: Airplane Towing in High Winds, TASK 09-10-00-580-804.
 - 2) Flat tire(s), do this task: Tow the Airplane with Flat Tire(s), TASK 09-10-04-580-801.

SUBTASK 09-10-00-580-027



DO NOT APPLY THE AIRPLANE BRAKES WHEN YOU TOW THE AIRPLANE WITH TOWBARLESS TOW VEHICLES. MOST TOWBARLESS TOW VEHICLES DO NOT HAVE A SHEAR PIN TO LIMIT THE LOADS IF THE AIRPLANE BRAKES ARE USED DURING TOWING. IF YOU APPLY THE BRAKES, YOU CAN APPLY LOADS TO THE NOSE LANDING GEAR THAT ARE MORE THAN THE DESIGN LOAD LIMITS. IF YOU DO NOT OBEY THIS WARNING, MAINTENANCE PERSONS CAN BE INJURED, AND DAMAGE WILL OCCUR TO THE NOSE LANDING GEAR, AND THE TOW VEHICLE.



DO NOT APPLY THE AIRPLANE BRAKES WHEN YOU TOW THE AIRPLANE WITH A TOW BAR. IF YOU USE THE AIRPLANE BRAKES WHILE YOU TOW THE AIRPLANE, YOU CAN CAUSE THE SHEAR PINS TO BREAK.



WHEN YOU USE A TOW BAR THAT DOES NOT SEPARATE WHEN THE FUSE PIN SHEARS, DO NOT USE UNCOORDINATED TRIES TO PANIC STOP THE TOW TUG AND/OR THE AIRPLANE AFTER A FUSE PIN SHEAR. THIS CAN CAUSE DYNAMIC LOADS THAT ARE MORE THAN THE INITIAL FUSE LOAD. DAMAGE TO THE AIRPLANE AND EQUIPMENT CAN OCCUR.

- (6) Only use the airplane brakes in an emergency.

NOTE: Fully charged accumulators are capable of approximately six brake applications.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 237
May 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-280-006

- (7) If the airplane brakes were used when the airplane was towed, do this task: Phase I Inspection, TASK 05-51-01-210-801.

SUBTASK 09-10-00-580-033

- (8) If the shear pin fractures during towing, do the following steps:

- (a) Check for any of these conditions:

- 1) Oversteering
- 2) Tow lug damage
- 3) Sudden brake application

- (b) Carefully disconnect the tow bar from the tow lug.

NOTE: The tow bar may have a force on it.

- 1) Slowly move the tow bar as necessary to remove any force between the tow bar and the tow lug.

- (c) If any of the conditions are found, do the following steps:

- 1) Examine the upper and lower ends of the shock strut of the nose gear for fluid leakage.
- 2) Inspect the tow lug and landing gear structure for damage.
- 3) Examine the outer cylinder of the landing gear.
- 4) Examine the nose landing gear trunnions for signs of damage.
- 5) Examine the nose landing gear trunnion attachment areas for signs of damage.
- 6) Examine the nose landing gear inner cylinder at tow fitting attach points.
- 7) Examine the doors, hinges, and retraction mechanism of the nose landing gear for signs of damage.
- 8) Examine the tow fitting and inner cylinder attachment for signs of damage.
- 9) If damage is found in any of the examinations above, do the phase II inspection (TASK 05-51-29-200-802)

- (d) If none of the conditions were found, no further inspections are required.

SUBTASK 09-10-00-580-028

- (9) Complete the airplane tow in a straight line for 6 ft (1829 mm) minimum.

NOTE: This procedure releases the turn forces applied to the nose gear when you tow the airplane and align the torsion if disconnected.

SUBTASK 09-10-00-580-029

- (10) If the nose gear turning angle was more than 78 degrees, do this task: Phase I Inspection, TASK 05-51-29-200-801.

SUBTASK 09-10-00-420-008

- (11) Connect the nose gear torsion links (TASK 32-21-31-400-803).

SUBTASK 09-10-00-440-005

- (12) Apply the parking brakes.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 09-10-00-080-007

- (1) Disconnect the tow bar from the tow fitting and remove the tow bar if installed.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 238
May 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-080-008



WHEN YOU REMOVE THE TOWING LEVER LOCKPIN AND HYDRAULIC SYSTEM A IS PRESSURIZED, MOVE AWAY FROM THE NOSE LANDING GEAR QUICKLY. THE NOSE LANDING GEAR CAN HAVE A SUDDEN MOVEMENT. THIS CAN CAUSE INJURY TO PERSONNEL OR DAMAGE TO THE EQUIPMENT.

- (2) Remove the NLG towing lever pin, SPL-1499, with streamer from the towing lever.

SUBTASK 09-10-00-080-009

- (3) Remove the nose and main landing gear downlock pins (TASK 32-00-01-080-801).

SUBTASK 09-10-00-580-030

- (4) Make sure that the nose landing gear wheels are centered.

END OF TASK

TASK 09-10-00-580-804

5. Airplane Towing in High Winds

(Figure 208, Figure 209, and Figure 210)

A. General

- (1) Tow the airplane in high winds within the permitted limits.
- (2) High winds can blow airborne sand and dust that can be a cause of slow operation to tow the airplane.

B. References

Reference	Title
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)

C. Location Zones

Zone	Area
713	Nose Landing Gear

D. Tow the Airplane in High Winds

SUBTASK 09-10-00-970-004



MAKE SURE THAT YOU DO THIS PROCEDURE BEFORE HIGH WINDS OCCUR. THIS WILL PREVENT THE AIRPLANE FROM ACCIDENTAL MOVEMENT. IF YOU DO NOT OBEY, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.



MAKE SURE THAT YOU STAY AWAY FROM THE NOSE WHEELS WHEN YOU REMOVE THE TOWING LEVER LOCKPIN AND STREAMER. IF YOU DO NOT OBEY, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.



DO NOT TOW THE AIRPLANE IN HIGH WINDS WITH THE CARGO DOORS OPEN. IF THE AIRPLANE IS TOWED IN HIGH WINDS WITH THE CARGO DOORS OPEN DAMAGE TO THE AIRPLANE AND DOOR CAN OCCUR.

- (1) Use the recommended tire to ground friction values for wet or dry configurations without parking brakes set.

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 239
Sep 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-00-580-034

- (2) Refer to (Figure 208) and (Figure 209) for permitted winds.
 - (a) If ice conditions exist or measured values for tire-to-ground friction coefficients are necessary, use actual tire-to-ground friction, the gross weight center gravity, and (Figure 210) to interpolate to maximum winds.
 - (b) Do these steps to check the maximum winds considerations and assumptions:
 - 1) To tow the airplane, make sure that the main and nose gear tires are free and the steering systems are in the applicable configuration.
 - a) Decrease the permitted maximum winds by one-third, if the movement is near to buildings or other aircraft.
 - 2) Make sure that the airplane Gross Weight (GW) and Center of Gravity (CG) are in the limits for the anticipated wind gust velocity, the tire-to-ground surface condition, and that they are also within the Weight and Balance Manual (WBM) approved limits.
 - a) Use different configurations of fuel in the tanks, and ballast in the lower cargo compartment(s).
 - b) Use the WBM to calculate the correct load necessary to get to the specified target maximum winds.
 - 3) If measured values for tire-to-ground friction coefficients (μ) are not available, use the lower limit of the applicable limit friction bands Table 205

Table 205/09-10-00-993-806 Main and Nose Gear Tire-to-Ground Friction Coefficient

	Surface Conditions (Ice)	Surface Conditions (Wet)	Surface Conditions (Dry)
(For Towing Operations) WITHOUT Parking Brakes Set	0.05 to 0.15	0.2 ^{*[1]} to 0.4	0.5 ^{*[1]} to 0.8

*[1] Maximum winds for these recommended tire-to-ground friction coefficients are provided in (Figure 208) and (Figure 209). For other data points use (Figure 210).

- 4) Add the wind gusts to steady wind velocity for maximum wind speed.
- 5) Decrease wind limits to account for operational considerations such as high-speed towing or contaminated runways.
- 6) Pay attention that a zero-ground slope is assumed.

SUBTASK 09-10-00-860-001

- (3) Set the aerodynamic surfaces to neutral positions.
 - (a) Move the trailing edge flaps to the UP position to decrease lift (TASK 27-51-00-860-804).
 - (b) Move the leading edge of the Krueger flaps and slats (if applicable) to the UP position to decrease lift (TASK 27-81-00-860-804).
 - (c) Stow the speed brakes to the retracted position.
 - (d) Set the stabilizer to 0°arc (0 rad) to the fuselage reference line.
 - (e) If you remove the power control units from the flight control surfaces, install the ground locks at the correct locations.

————— END OF TASK —————

EFFECTIVITY
SIA ALL

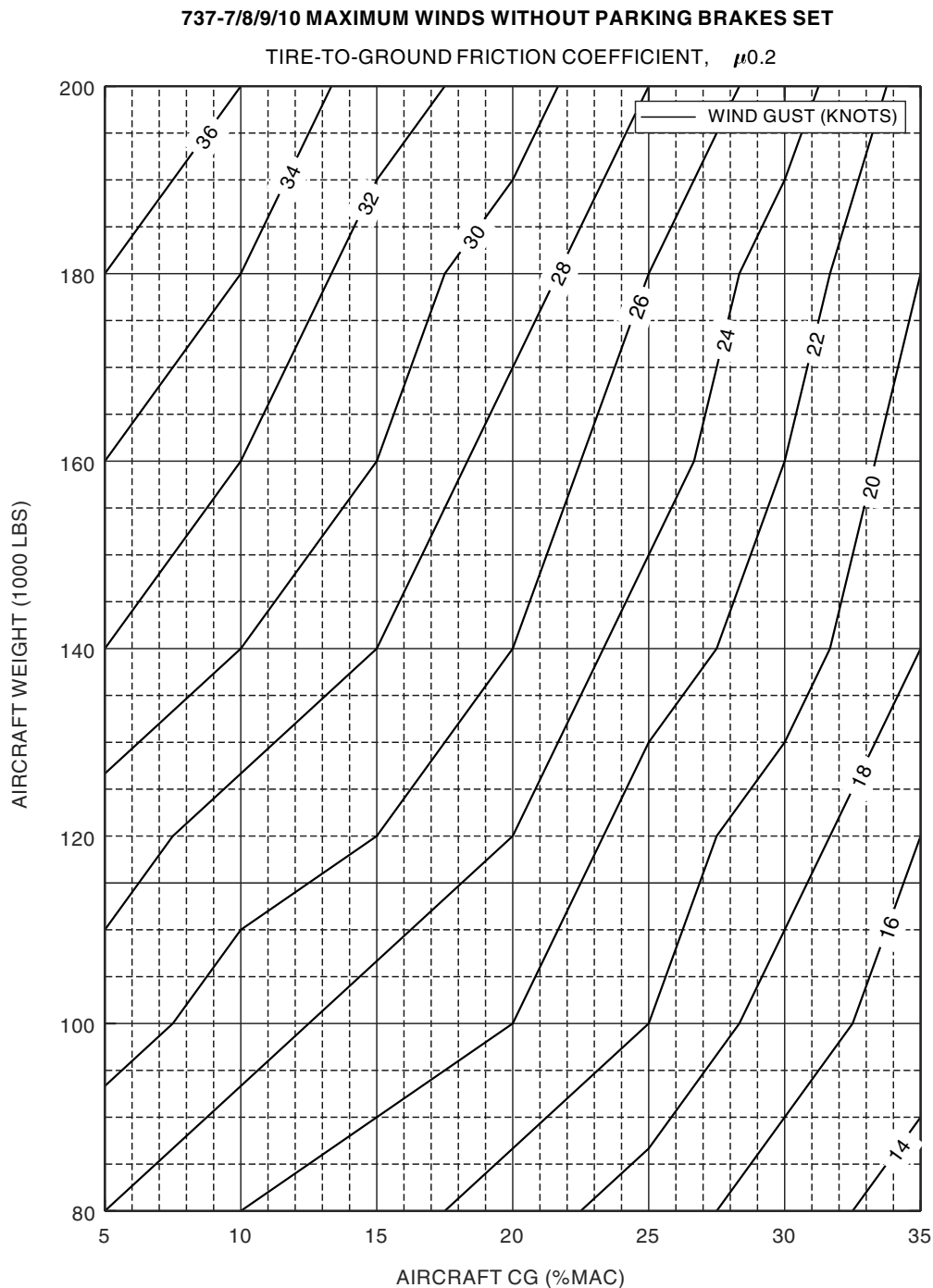
D633AM101-SIA

09-10-00

Page 240
Sep 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



3044145 S0000811083_V1

737MAX Maximum Winds WITHOUT Parking Brakes Set for Recommended Wet Tire to Ground Friction of 0.2

Figure 208/09-10-00-990-811

EFFECTIVITY
SIA ALL

09-10-00

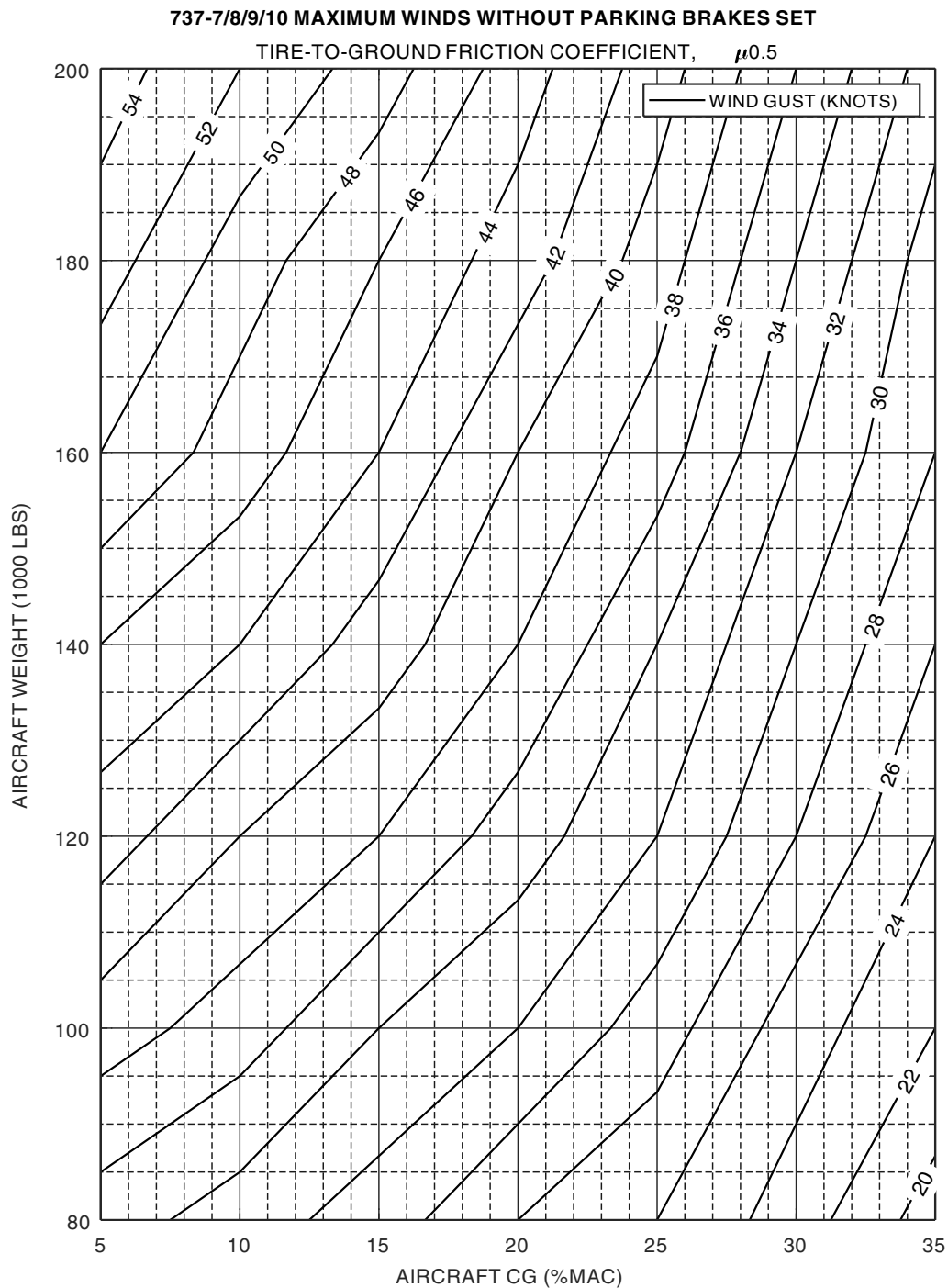
D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 241
Sep 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



3044149 S0000811084_V1

737MAX Maximum Winds WITHOUT Parking Brakes Set for Recommended Dry Tire to Ground Friction of 0.5

Figure 209/09-10-00-990-812

EFFECTIVITY
SIA ALL

09-10-00

D633AM101-SIA

Page 242
Sep 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

TABLE KEY AND UNITS

MU	CG	CG	CG	CG	CG	CG	CG
GW	MW	MW	MW	MW	MW	MW	MW
GW	MW	MW	MW	MW	MW	MW	MW
GW	MW	MW	MW	MW	MW	MW	MW
GW	MW	MW	MW	MW	MW	MW	MW
GW	MW	MW	MW	MW	MW	MW	MW
GW	MW	MW	MW	MW	MW	MW	MW
GW	MW	MW	MW	MW	MW	MW	MW

MU - TIRE TO GROUND FRICTION
CG - CENTER OF GRAVITY IN %MAC.
GW - GROSS WEIGHT IN 1000 LBS
MW - MAXIMUM WINDS IN KNOTS

0.1	5	10	15	20	25	30	35
80	17	16	15	14	13	11	9
100	19	18	17	16	14	12	11
120	21	20	19	17	16	14	12
140	23	21	20	18	17	15	13
160	24	23	21	20	18	16	14
180	26	24	23	21	19	17	14
200	27	26	24	22	20	18	15

0.5	5	10	15	20	25	30	35
80	35	33	31	28	26	23	19
100	39	37	34	32	29	25	22
120	43	40	38	35	32	28	24
140	46	44	41	38	34	30	26
160	50	47	44	40	37	32	28
180	53	49	46	43	39	34	29
200	55	52	49	45	41	36	31

0.2	5	10	15	20	25	30	35
80	24	22	21	19	17	15	13
100	27	25	23	22	20	17	15
120	29	27	26	24	21	19	16
140	32	30	28	26	23	21	18
160	34	32	30	27	25	22	19
180	36	34	31	29	26	23	20
200	38	36	33	31	28	25	21

0.6	5	10	15	20	25	30	35
80	37	35	33	30	27	24	20
100	42	39	37	34	31	27	23
120	46	43	40	37	34	30	25
140	50	47	44	40	37	32	28
160	53	50	47	43	39	35	30
180	56	53	49	46	41	37	31
200	59	56	52	48	44	39	33

0.3	5	10	15	20	25	30	35
80	28	27	25	23	21	18	16
100	32	30	28	26	23	21	18
120	35	33	31	28	26	23	19
140	38	35	33	31	28	25	21
160	40	38	35	33	30	26	22
180	43	40	38	35	32	28	24
200	45	42	40	37	33	30	25

0.7	5	10	15	20	25	30	35
80	40	37	35	32	29	26	22
100	44	42	39	36	33	29	24
120	49	46	43	39	36	32	27
140	52	49	46	43	39	34	29
160	56	53	49	45	41	37	31
180	59	56	52	48	44	39	33
200	63	59	55	51	46	41	35

0.4	5	10	15	20	25	30	35
80	32	30	28	26	24	21	18
100	36	34	31	29	26	23	20
120	39	37	35	32	29	26	22
140	42	40	37	34	31	28	24
160	45	43	40	37	33	30	25
180	48	45	42	39	36	32	27
200	51	48	45	41	37	33	28

0.8	5	10	15	20	25	30	35
80	41	39	36	34	30	27	23
100	46	44	41	38	34	30	25
120	51	48	45	41	37	33	28
140	55	52	48	44	40	36	30
160	59	55	52	48	43	38	33
180	62	59	55	50	46	41	35
200	66	62	58	53	48	43	37

3044155 S0000811085_V1

737MAX Maximum Winds WITHOUT Parking Brakes Set (Data for Interpolation) Figure 210/09-10-00-990-813

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-00

Page 243
Sep 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

TOW THE AIRPLANE WITH FLAT TIRES - MAINTENANCE PRACTICES

1. **General**

- A. This procedure has a task to tow the airplane with one or more flat tires.
- (1) If one or two nose landing gear tires are flat, do not use towbarless towing.
 - (2) If more than one tire is flat, change the flat tires with serviceable tires before you tow the airplane, if possible.
 - (3) If the flat tires cannot be changed, tow the airplane with cables attached to each main gear.
- B. When a single tire failure occurs, which includes tire burst, the opposite tire will carry the combined load in an over deflected condition. If the load is very high and the taxi run is long a second failure can result.
- C. When you taxi the airplane for long distances on a loaded flat tire it will cause the tire to shred and cut the rubber material. This puts the load on the wheel rim to move the airplane.
- D. During a tire failure sequence, while towing the airplane, conditions can be encountered on one axle as follows:
- (1) Two good tires (before any failure occurs), or
 - (2) One overload tire with one flat tire, or
 - (3) Two flat tires rolling on rubber, or
 - (4) Two flat tires rolling on the wheel rims.
- E. A tire can fail due to wear or an overheated brake, which causes the wheel fuse plug to melt.
- F. When the airplane has flat tires, keep the tow operation to a minimum. Flat tires can put too much load on the inflated tires and cause damage to the good tires. This will make it necessary to replace the tires. The tow operation can also damage the wheels, landing gear, and the airplane structure.

TASK 09-10-04-580-801

2. **Tow the Airplane with Flat Tire(s)**

A. **General**

- (1) When the airplane has one flat tire, towing is not necessary unless unusual vibration or other failures occur.
- (2) Do not use Towbarless Towing if one or two nose landing gear tires are flat.
- (3) When there is more than one flat tire per gear, replace the flat tires to where there is only one flat tire per gear, if possible.

B. **References**

Reference	Title
09-10-00-580-801	Nose Gear Maintenance Towing (P/B 201)
09-10-00-580-802	Main Gear Maintenance Towing (P/B 201)
09-10-00-990-807	Figure: Airplane Towing Pushback Hazard Zones (P/B 201)
10-11-05-500-801	Chock Installation Winds/Gusts Maximum 40 mph (35 Knots) (P/B 201)
24-22-00-860-802	Remove Electrical Power (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

EFFECTIVITY
SIA ALL

09-10-04

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 201
Sep 15/2021



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1505	Chocks - Wheel Part #: 19CAL455 - Type 1 Supplier: \$1329 Part #: 99-9028-6000 Supplier: 59603 Part #: AC6820-LR Supplier: 032T9 Part #: ALPHACHOCKS MID Supplier: 6X2T Part #: W86 Supplier: 3XZM7 Part #: W88 Supplier: 3XZM7 Opt Part #: W92 Supplier: 9L752
SPL-1498	Eyebolt - Towing, Main Gear Part #: F72719-12 Supplier: 81205 Opt Part #: F72719-500 Supplier: 81205

D. Location Zones

Zone	Area
700	Landing Gear and Landing Gear Doors

E. Tow the Airplane with One Flat Tire on Each Landing Gear



ALL WORK AROUND THE AIRPLANE MUST STOP WHEN LIGHTNING OCCURS AT A DISTANCE OF 6 MILES (10 KILOMETERS) OR LESS. ALL PERSONNEL MUST GO IN A BUILDING OR THE AIRPLANE. LIGHTNING CAN KILL PERSONNEL OR CAUSE INJURY.

SUBTASK 09-10-04-580-001

- (1) Do the nose gear towing procedure to tow the airplane.

NOTE: Do this procedure when the airplane has one flat tire on each landing gear.

- (a) Do the applicable steps in this task: Nose Gear Maintenance Towing, TASK 09-10-00-580-801.
- (b) Keep the tow speeds to a minimum.
- (c) Do not make sharp turns, make a turn with the largest radius possible.

F. Tow the Airplane with More Than One Flat Tire on Each Landing Gear

NOTE: If there is more than one flat tire on each landing gear, do not use the nose wheel to tow the airplane. This can put too much force on the gear and will cause damage to the nose landing gear.

SUBTASK 09-10-04-580-002

- (1) Do the main gear towing procedure to tow the airplane.

- (a) Do this task: Main Gear Maintenance Towing, TASK 09-10-00-580-802.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-04

Page 202
May 15/2023



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-10-04-560-001



GROUND PERSONNEL ARE PROHIBITED FROM ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING. MAINTAIN MINIMUM OF 10 FT (3 M) AWAY FROM LANDING GEAR, TOWBAR, AND TOW TRACTOR. ENTERING PUSHBACK HAZARD ZONE WHILE AIRCRAFT IS MOVING CAN CAUSE INJURY OR DEATH TO PERSONNEL.

- (2) Keep all persons and operators away from the pushback hazard zones shown in Figure 09-10-00-990-807.

SUBTASK 09-10-04-580-003



MAKE SURE THAT YOU PUT THE TOWING LEVER IN THE TOW POSITION BEFORE YOU TOW THE AIRPLANE. IF YOU DO NOT, YOU CAN CAUSE DAMAGE TO LANDING GEAR COMPONENTS OR THE TOWING EQUIPMENT.

- (3) Start the towing operation with a slow and smooth movement.
- (a) One person will control the movement of the airplane. Make sure that you can clearly see the flight compartment and the tow vehicles.
 - (b) Increase the cable forces on the airplane slowly until the airplane moves.
 - (c) When you use more than one vehicle to pull the airplane, they must be in the same straight line joined one behind the other.
 - (d) Make sure that you use the largest radius to make turns, when possible.
 - (e) Make sure that the angle does not exceed ± 30 degrees on the cables.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 09-10-04-480-001

- (1) Install the wheel chock, COM-1505.
- (a) Do this task: Chock Installation Winds/Gusts Maximum 40 mph (35 Knots), TASK 10-11-05-500-801.

SUBTASK 09-10-04-020-001

- (2) Disconnect the tow bar from the tow vehicle.

SUBTASK 09-10-04-080-001

- (3) Remove the main gear towing eyebolt, SPL-1498 assembly from each main landing gear.

SUBTASK 09-10-04-840-001

- (4) Remove the hydraulic power.
- (a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 09-10-04-860-001

- (5) Remove electrical power.
- (a) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

————— **END OF TASK** —————

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-10-04

Page 203
Sep 15/2021



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

TAXI THE AIRPLANE - MAINTENANCE PRACTICES

1. General

- A. This procedure has the instructions to taxi the airplane for maintenance.
- (1) Refer to the Operations manual to taxi the airplane for revenue service.
- B. Taxi Safety
- (1) The procedures to taxi the airplane must be done by approved personnel.
- (2) The path must be clear of all persons and vehicles before you start to taxi the airplane.
- (3) Get approval from the airport ground control to taxi the airplane to prevent interfering with other airport operations.
- (4) Keep clearance from the buildings and the other airplanes, at all times.
- (5) Electrical power is necessary to taxi the airplane safely and to operate the components that follow:
- (a) Taxi lights
- (b) Navigation lights
- (c) Radio and intercom equipment
- (d) Other necessary systems.
- (6) Look for a lateral fuel imbalance condition.
- NOTE: When an airplane is moved with a lateral fuel imbalance that is more than the limits while on the ground, a structural inspection is not required. This is only if usual taxi procedures were followed, the maximum taxi speed was below 29 mph (25 knots) and no maximum or hard braking occurred. If these limitations were more than the limits, a structural inspection is required.
- (7) The applicable hydraulic system must be pressurized to supply hydraulic pressure to operate the brakes and nose wheel steering.
- (8) The crew must know the ground and weather conditions, and make sure that the area around the airplane is safe to taxi the airplane.
- (9) Use a checklist to make sure that the airplane taxi operation is safe.
- C. Communications
- (1) The flight compartment windows limit the field of view and the ground operations near the airplane.
- (2) There must be clear communication between the airplane and ground crew during all of the taxi operation.
- (3) Use hand signals, lights, intercom, or radio communications for safe taxi procedures.
- (4) Communicate with the ground control authority to let the tower know the airplane path and taxi operation.
- D. Taxi the Airplane
- (1) When you taxi the airplane on the ground, the movement is equivalent to other standard tricycle geared airplanes.
- (a) The nose wheel steering, and the engine thrust are used as necessary, to taxi the airplane.
- (2) Airplane Ground Stability

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

Page 201
Sep 15/2021



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- (a) The airplane center of gravity (CG) must always be below the ground stability limits during the airplane taxi (Figure 201).
- (b) Use the component weight and the CG data to calculate and find the airplane CG.
- (3) Airplane Taxi Clearances
 - (a) Make sure that there is always sufficient clearance between the airplane and other structures when you taxi the airplane.
 - 1) The airplane position, area, and surface conditions make it necessary to change the throttle position. A high thrust position is necessary to start the airplane movement. Then decrease the thrust to continue the airplane movement.
 - 2) Keep a minimum distance of 15 ft (5 m) between airplanes, which is the necessary clearance to turn the airplane.
 - 3) When the APU is running on the taxi or parked airplane, keep a minimum clearance of 32.8 ft (10.0 m).
 - NOTE: The clearance must be between the APU exhaust port and the adjacent airplane's wing tip (fuel vent).
- (4) Airplane Taxi Speed
 - (a) When the airplane starts to move, continue to keep a slow and smooth force in a straight line on the airplane.
 - (b) Keep the airplane taxi speed below 23 mph (20 knots) to prevent damage to tires, brakes, and airplane structure.
 - (c) Make sure that you know the weather conditions for the area and the type of ground surface to taxi the airplane.
- (5) Airplane Taxi Turns and Turn Radius
 - (a) Move the airplane forward before you start to turn the airplane.
 - (b) Decrease the taxi speed of the airplane using local conditions before you make a turn and prevent skids. Dry surface speeds are 12 $\pm$ 2 mph (10 $\pm$ 2 knots).
 - (c) Always use the largest turn radius.
 - (d) Do not turn the airplane more than the turn radii (Figure 202).
 - NOTE: Make sure that you monitor the wingtips and the horizontal stabilizer for clearance with buildings, equipment, and other airplanes.
 - (e) Do not use the brakes or stop the airplane while making a turn.
 - 1) Use the brakes to decrease the speed of the airplane before a turn is started.
 - NOTE: When the brakes are used during a turn, it will cause the main and nose landing tires to wear.
 - 2) Make a minimum radius turn with maximum nose wheel steering and engine thrust only.
 - (f) Complete the airplane taxi in a straight line for a minimum of 6 ft (2 m) to remove turn forces on the nose gear.
- (6) Refer to Figure 202 for the minimum airplane turn radius. The wingtip will make the largest arc in a turn and give the minimum clearance path.
- (7) Airplane Taxi Extreme Weather Conditions
 - (a) The weather and ground surface conditions are very important to taxi the airplane safely.
 - 1) Know the up-to-date weather conditions.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

Page 202
May 15/2022



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- 2) Know the ground surface condition to taxi the airplane.
 - 3) Get the taxi speed for the weather and the ground surface conditions: high winds, rain, slush, snow, or ice.
- (b) Taxi the airplane with the flaps up.

E. Airplane Taxi Characteristics

- (1) These components can change geometry of a turn:
 - (a) Nose wheel steering angle
 - (b) Engine power/thrust
 - (c) Center of gravity (CG) location on the airplane
 - (d) Airplane gross weight
 - (e) Taxi surface conditions
 - (f) Airplane ground speed
 - (g) Differential braking used.
- (2) Engine Operation, Hazard Areas



STAY AWAY FROM THE ENGINE INLET, AND THE EXHAUST AREAS WHILE THE ENGINE OPERATES. INJURIES TO PERSONNEL CAN OCCUR.

- (a) When you operate jet engine airplanes, you must follow all precautions necessary to prevent injury to persons or damage to structures and equipment. Keep all persons and operators away from the hazard areas during engine idle and at the engine breakaway thrust.
- (b) Refer to Engine Ground Safety Precautions, TASK 71-00-00-800-801-G00 for the engine hazard areas at idle, breakaway, and takeoff power.
 - 1) All persons must keep away from the two engine inlet and exhaust areas.
 - 2) The engines have hot and high velocity gases that come out of the exhaust nozzles of the engine.
 - 3) The velocity of the engine fan air, specially at high thrust positions, is more than enough to cause serious injury or death to persons.
 - 4) High velocity fan air will come out and continue to come out and move forward when the thrust reverser is in reverse position.
- (3) Refer to Figure 203 for the angles of view from the flight compartment for a crewman in the left seat that is correctly adjusted.

TASK 09-20-00-580-801

2. Taxi the Airplane

(Figure 202)

A. General

- (1) This task has the procedures to taxi the airplane.
- (2) Make sure that you read the General statement at the start of this procedure. To taxi the airplane correctly you must know these cautions and procedures.
 - (a) Taxi Safety
 - (b) Communications

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-20-00

Page 203
May 15/2022



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- (c) Taxi the Airplane
- (d) Airplane Taxi Characteristics

B. References

Reference	Title
10-11-05-500-801	Chock Installation Winds/Gusts Maximum 40 mph (35 Knots) (P/B 201)
12-11-00-650-803	Pressure Refuel Procedure (P/B 301)
12-15-31-610-802	Main Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
12-15-41-610-802	Nose Landing Gear Shock Strut Servicing, Airplane on the Ground (P/B 301)
24-22-00-860-801	Supply Electrical Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
71-00-00-800-801-G00	Engine Ground Safety Precautions (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1505	Chocks - Wheel Part #: 19CAL455 - Type 1 Supplier: \$1329 Part #: 99-9028-6000 Supplier: 59603 Part #: AC6820-LR Supplier: 032T9 Part #: ALPHACHOCKS MID Supplier: 6X2T Part #: W86 Supplier: 3XZM7 Part #: W88 Supplier: 3XZM7 Opt Part #: W92 Supplier: 9L752

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Prepare to Taxi the Airplane

NOTE: The steps that follow are the minimum procedures necessary to taxi the airplane.

SUBTASK 09-20-00-580-001

- (1) Use a taxi checklist that is applicable to your operation.

SUBTASK 09-20-00-580-002

- (2) Maintenance Personnel Necessary for Safe Taxi Operation

- (a) Two flight compartment crew persons (minimum).

- 1) One person as an observer and one person must be approved for taxi and is trained in the steps that follow:

NOTE: The observer does not have to be approved to taxi the airplane.

- a) Correct procedures to prepare the flight compartment.
- b) The engine start, operation, and shutdown procedures.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

Page 204
May 15/2023



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- c) The engine fire and emergency procedures.
 - d) The radio and intercom operation and procedures.
 - e) The taxi procedures (turning, wing tip clearances, taxi speeds, etc.).
- (b) One or two ground personnel to help the flight crew with the procedures that follow:
- NOTE: In areas that have small spaces, work stands, vehicles, more ground personnel are necessary to monitor the wing clearances.
- 1) Remove and replace the wheel chocks
 - 2) Engine start
 - 3) Airplane movement
 - 4) Airplane taxi path is clear at all times.

SUBTASK 09-20-00-210-001

- (3) Examine the external areas of the airplane.
- (a) Make sure that the wheel chocks are installed correctly.
 - 1) Do this task: Chock Installation Winds/Gusts Maximum 40 mph (35 Knots), TASK 10-11-05-500-801.
 - (b) Make sure that these components are locked, latched, and are secure from movement when you taxi the airplane.
 - 1) Engine cowl
 - 2) All external passenger and cargo doors
 - 3) All external hatches
 - (c) Make sure that the engine inlets and exhausts are clear.
 - (d) Make sure that the flight control surfaces are clear and will not touch the ground equipment.
 - (e) Make sure that the landing gear tires are in good condition.
 - (f) Make sure that the main landing gear shock struts are serviced to the correct pressure to taxi the airplane.

NOTE: Do not taxi the airplane with the shock struts fully compressed.

 - 1) Do this task: Main Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-31-610-802.
 - (g) Make sure that the nose landing gear shock struts are serviced to the correct pressure to taxi the airplane.
 - 1) Do this task: Nose Landing Gear Shock Strut Servicing, Airplane on the Ground, TASK 12-15-41-610-802.

NOTE: Do not taxi the airplane with the shock struts fully compressed.
 - (h) Make sure that the nose landing gear shock strut does not show more than 10 in. (254 mm) maximum of the chrome surface.

NOTE: Do not let the nose landing gear shock strut extend more than the maximum limit. When the extension is more than the limit, it causes the centering cam to engage and will cause damage the shock strut during a turn.

NOTE: The nose landing gear shock strut extension keeps a forward center of gravity on the airplane that stops the airplane from falling back on its tail.
 - (i) Make sure that the nose landing gear towing lever is in the NORMAL position.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

Page 205
Sep 15/2021



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- (j) Adjust the flight compartment seat to where you can to operate the rudder and brake pedals.
- (k) Adjust the seat to make sure that you have the correct view to see the path to taxi the airplane.
- (l) Make sure that all airplane systems are ready and safe before you apply electrical power.
- (m) Apply electrical power to the airplane.
 - 1) Do this task: Supply Electrical Power, TASK 24-22-00-860-801.
- (n) Make sure that the fuel quantity indicator on the upper center display shows 1675 lb (760 kg) minimum of fuel.

NOTE: There must be at least 1675 lb (760 kg) of fuel in the No. 1 and No. 2 fuel tanks to cool and the hydraulic fluid.

 - 1) Add fuel for the engine start and taxi operations.
 - a) Do this task: Pressure Refuel Procedure, TASK 12-11-00-650-803.
- (o) Pressurize hydraulic systems A and B.
 - 1) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: The hydraulic systems must be pressurized to use the brake and nose wheel steering operations.

 - When all of the hydraulic systems do not operate, do not taxi the airplane.
 - Hydraulic system B supplies power to the brakes. Hydraulic system A supplies automatic backup if system B fails.
 - Hydraulic system A supplies power to the nose wheel steering. Hydraulic system B supplies backup power if system A fails.
 - If all hydraulics stop operating while you taxi the airplane, the brakes will operate through the brake accumulator. When the airplane has fully charged accumulators, approximately six brake applications are available.
- (p) Put the landing gear control lever in the DN position.

NOTE: The landing gear control lever must be in the DN position to use the nose wheel steering system.
- (q) Set the VHF radio to the correct frequency to communicate with airport ground control.



WARNING

DO NOT CONNECT A HEADSET AND DO NOT TOUCH CONNECTIONS TO THE AIRPLANE DURING ATMOSPHERIC ELECTRICAL ACTIVITY OR STRONG RADIATIVE FIELDS. LIGHTNING STRIKE AND HIGH DISCHARGE CURRENTS CAN CAUSE SEVERE INJURY.

- (r) Make sure that the service interphone and hand radios operate, and that the ground crew can hear you.

SUBTASK 09-20-00-910-001

- (4) Make sure that you know the dangerous area during engine idle and at the engine breakaway thrust.
 - (a) Refer to this task for engine ground safety: Engine Ground Safety Precautions, TASK 71-00-00-800-801-G00.

SUBTASK 09-20-00-440-001

- (5) Make sure that the parking brake is set.

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-20-00

Page 206
May 15/2022



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-20-00-580-003

- (6) Get approval from the airport ground control to start the airplane engines.

SUBTASK 09-20-00-580-004

- (7) Communicate with the ground crew to remove the wheel chocks and static ground wires.

SUBTASK 09-20-00-440-002

- (8) Put the beacon light on to show that the engines are operating.

SUBTASK 09-20-00-440-003

- (9) Put the navigation lights on.

NOTE: The navigation lights must be on when you taxi/move the airplane.

SUBTASK 09-20-00-580-005



MAKE SURE THAT ALL PERSONNEL AND EQUIPMENT ARE AWAY FROM THE AREA BELOW THE ENGINE INLET. THE NACELLE ANTI-ICE AIR EXHAUST CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (10) Make sure that the area below the engine inlet is clear of personnel and equipment.

SUBTASK 09-20-00-860-001



STAY AWAY FROM THE ENGINE INLET, AND THE EXHAUST AREAS WHILE THE ENGINE OPERATES. INJURIES TO PERSONNEL CAN OCCUR.

- (11) Start the airplane engines.
 - (a) Do this task: Start the Engine (Selection), TASK 71-00-00-910-802-G00.

SUBTASK 09-20-00-580-006

- (12) Get approval to taxi the airplane from airport ground control when the airplane is ready to taxi.

F. Taxi the Airplane

SUBTASK 09-20-00-580-007

- (1) When you get approval from the ground crew to taxi the airplane:
 - (a) Release the parking brakes.
 - (b) Supply the engine power smoothly to start the airplane in a forward movement.
 - (c) Put the engines back to idle power when the airplane starts to move.

SUBTASK 09-20-00-580-008

- (2) Make sure that the airplane moves in a forward and straight line before a turn is started.

SUBTASK 09-20-00-580-009

- (3) Use the tiller to turn the airplane or the rudder pedals for the nose wheel steering.

NOTE: When the tiller for nose wheel steering is turned to its maximum, there is approximately 78 ± 2 degrees of nose wheel steering. There is approximately 7 degrees of nose wheel steering through maximum movement of the rudder pedals.

SUBTASK 09-20-00-580-010

- (4) Communicate with the ground crew during a turn to make sure the airplane has the necessary clearance from airplanes, buildings and equipment.

SUBTASK 09-20-00-580-011

- (5) Taxi the airplane slowly at minimum power with the nose wheel on the taxi line.

EFFECTIVITY
SIA ALL

09-20-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

Page 207
Sep 15/2021



737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL

SUBTASK 09-20-00-580-012

- (6) Use the Inertial Reference System (IRS) in the ground speed (GS) mode to monitor the taxi speed.

SUBTASK 09-20-00-580-013



CAUTION

DO NOT USE THE BRAKES CONTINUOUSLY TO KEEP THE NECESSARY TAXI SPEED. IF YOU USE THE BRAKES WITHOUT SUFFICIENT TIME FOR THE BRAKE TEMPERATURE TO DECREASE, YOU CAN CAUSE THE BRAKES TO BECOME TOO HOT. THIS CAN CAUSE BRAKE DAMAGE OR THE TIRE INFLATION PRESSURE TO DECREASE BECAUSE A WHEEL-THERMAL-FUSE PLUG MELTED.

- (7) Operate the brakes slowly and smoothly for short periods only.

NOTE: It is possible that the brake temperature monitoring system does not indicate high wheel temperatures if the heat comes from continuous light brake applications. Do not taxi the aircraft at low speeds that require continuous or frequent brake applications.

SUBTASK 09-20-00-580-014



CAUTION

DO NOT TAXI MORE THAN 8 MILES. IF YOU TAXI MORE THAN 8 MILES, THE BRAKES CAN BECOME TOO HOT. THE HEAT CAN ALSO MELT THE THERMAL-HEAT PLUG WHICH WILL DECREASE THE TIRE INFLATION PRESSURE. DAMAGE TO THE WHEELS, BRAKES, AND TIRES CAN OCCUR.

- (8) Limit the airplane taxi distance to 8 mi (13 km). When the taxi distance is more, stop the taxi procedure and let the tires cool for one hour, then continue to taxi the airplane.

SUBTASK 09-20-00-580-015

- (9) When you make a turn during the taxi procedure:
- (a) Always use the largest radius possible when you turn the airplane to decrease gear loads and tire wear.
 - (b) Make sure that the airplane continues to move while a turn is made.
 - (c) Do not stop the airplane in a turn.

SUBTASK 09-20-00-580-016

- (10) Complete the taxi in a straight line roll for a minimum of 6 ft (2 m), if possible.

SUBTASK 09-20-00-580-017

- (11) Operate the brakes to stop the airplane.

SUBTASK 09-20-00-440-004

- (12) Apply the parking brakes.

SUBTASK 09-20-00-580-018

- (13) Use the airline checklist to deactivate and shutdown the airplane systems.

SUBTASK 09-20-00-480-001

- (14) Communicate to the ground crew.
- (a) Install the wheel chock, COM-1505.

EFFECTIVITY
SIA ALL

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

Page 208
Sep 15/2021



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL

- 1) Do this task: Chock Installation Winds/Gusts Maximum 40 mph (35 Knots),
TASK 10-11-05-500-801.

NOTE: If the ramp does not slope: Move the aft NLG chocks away from the tires. During the refuel, the NLG tires roll aft as the MLG shock absorber compresses. Make sure that the chocks do not touch the MLG tires. The weight of the fuel can lower the aircraft and cause the tires to catch the chocks.

NOTE: If the ramp slopes: Make sure that the chocks down from the tires touch the NLG and MLG tires. Make sure that the chocks up from the tires do not touch the NLG and MLG tires.

- (b) Install the static electrical ground wire.

SUBTASK 09-20-00-040-001

- (15) Release the parking brake (optional).

———— **END OF TASK** ————

EFFECTIVITY
SIA ALL

D633AM101-SIA

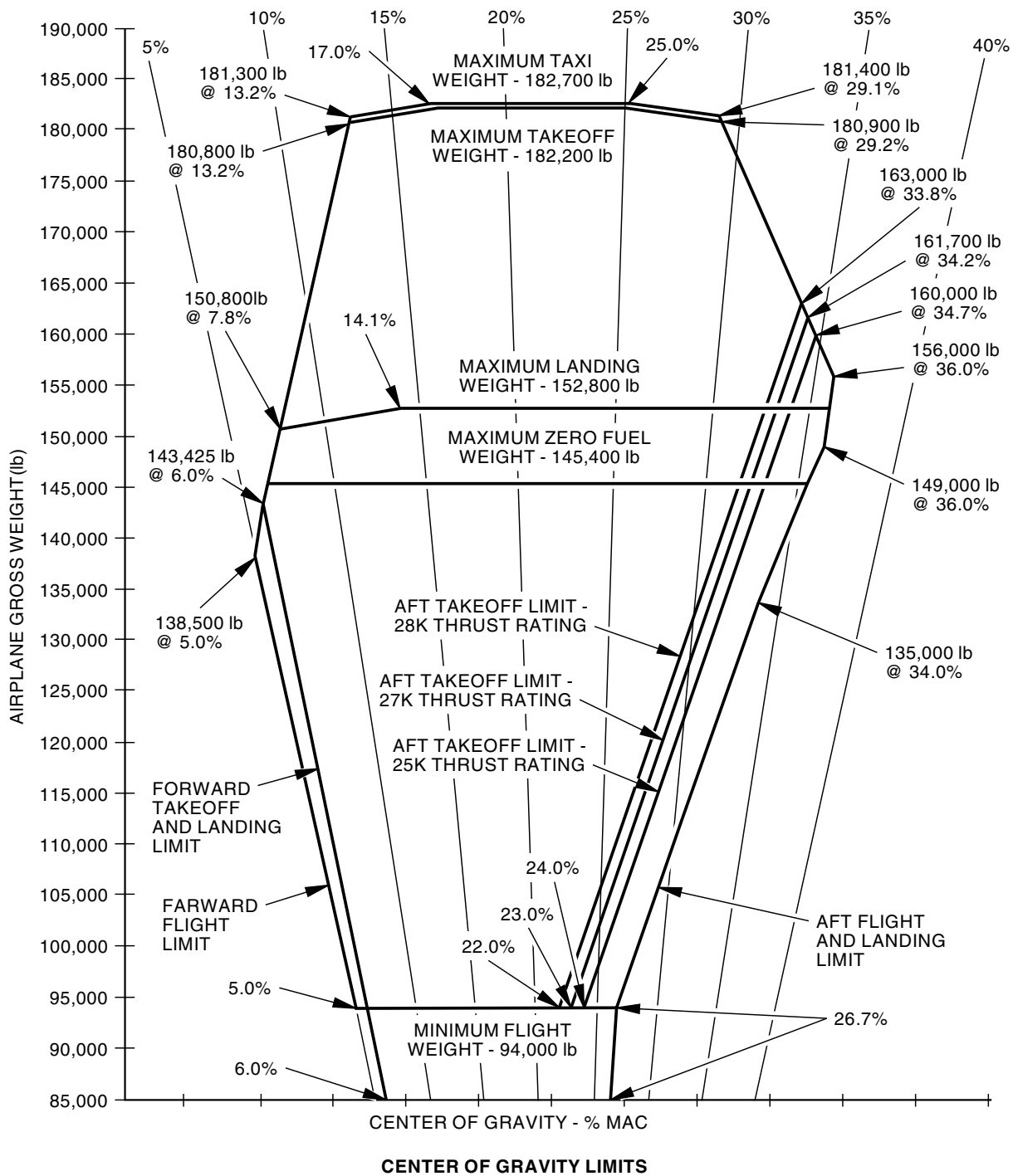
ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

Page 209
Sep 15/2021



737-7/8/8200/9/10
AIRCRAFT MAINTENANCE MANUAL



2410653 S00061526059_V5

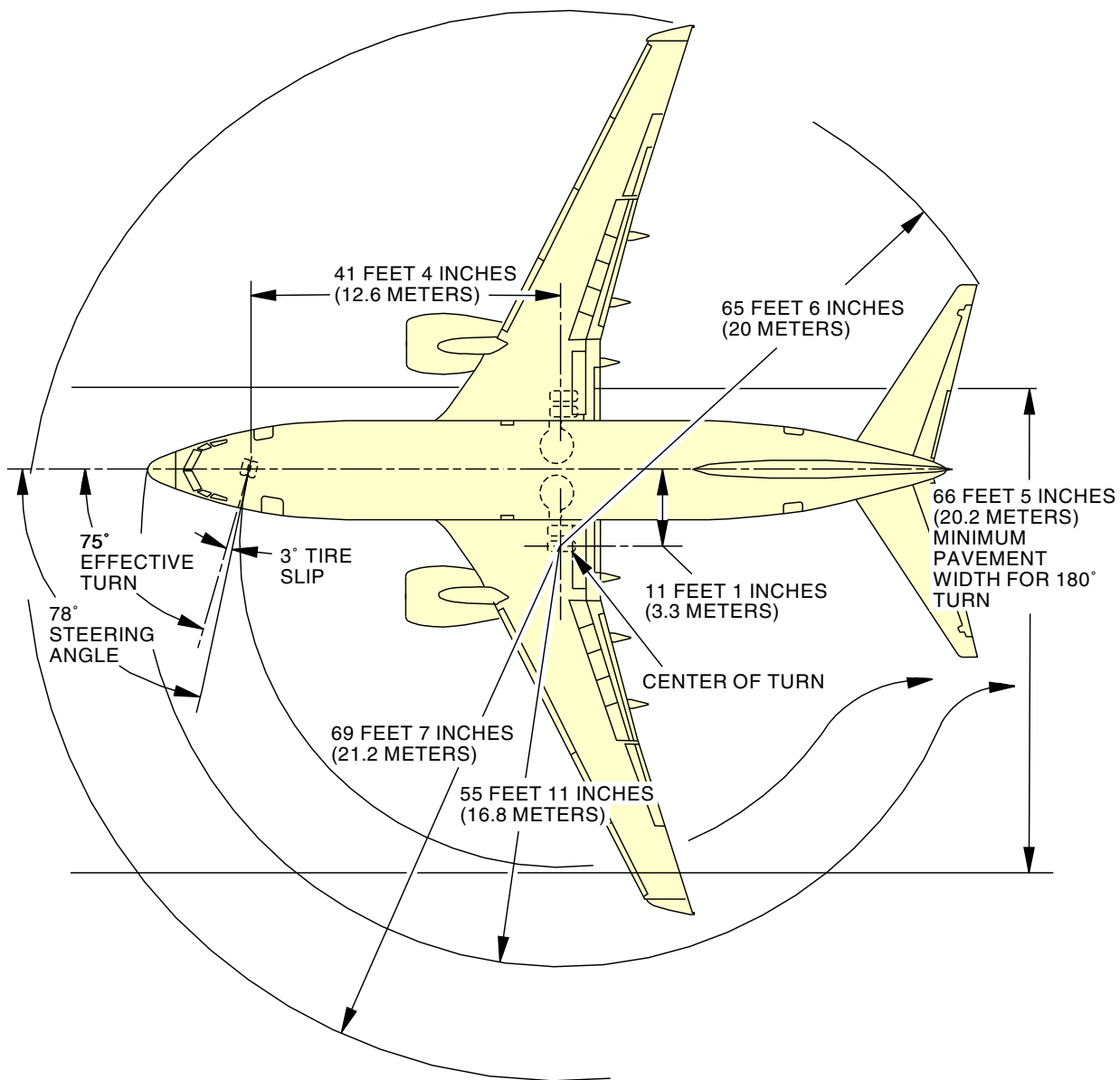
Maximum Gross Weight Versus Center of Gravity
Figure 201/09-20-00-990-804

EFFECTIVITY
SIA ALL

09-20-00

D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details



2410686 S00061526140_V1

Taxi Turning Radius
Figure 202/09-20-00-990-802

EFFECTIVITY
SIA ALL

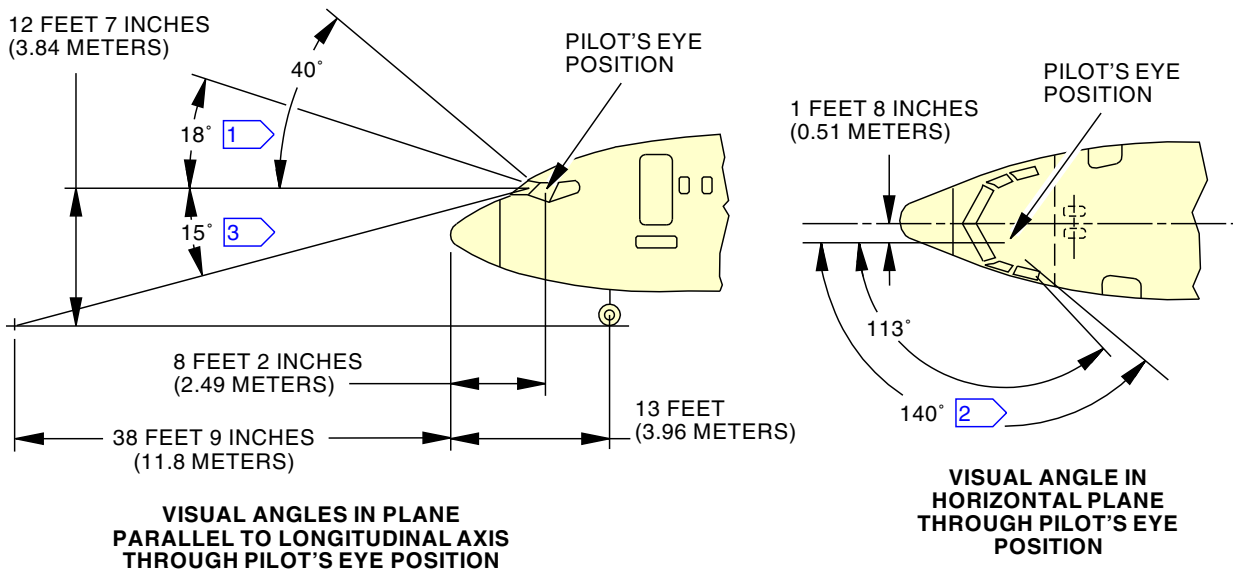
D633AM101-SIA

ECCN 9E991 BOEING PROPRIETARY - See title page for details

09-20-00

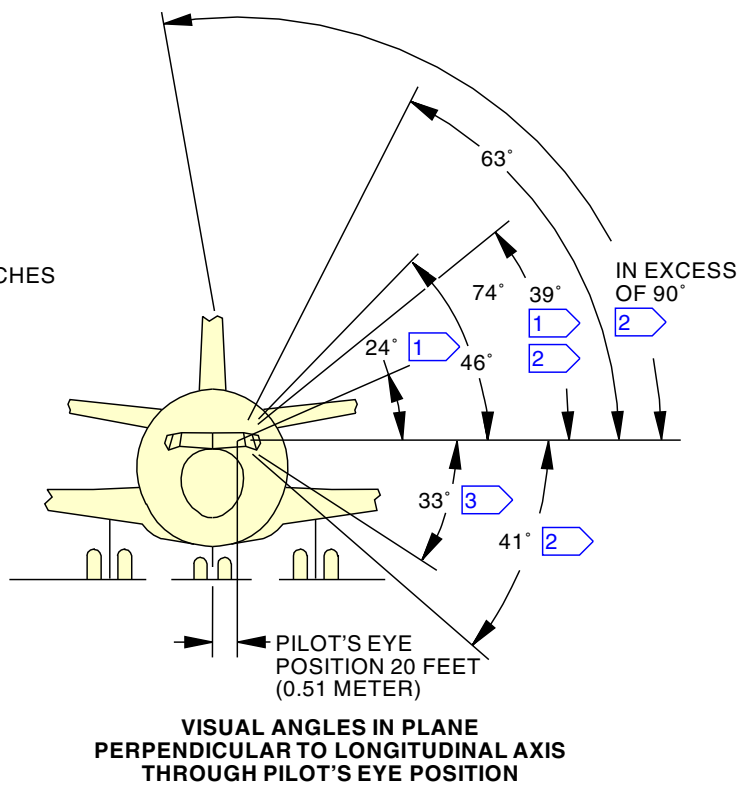
Page 211
May 15/2022

737-7/8/8200/9/10 AIRCRAFT MAINTENANCE MANUAL



NOTE: HEAD ROTATED ABOUT POINT 3.3 INCHES (0.08 METER) AFT OF PILOT'S EYE POSITION.

- 1** UPWARD VISION THROUGH MAIN WINDOW.
- 2** WITH HEAD MOVED 5 INCHES (0.13 METERS) OUTBOARD
- 3** DOWNWARD VISION THROUGH MAIN WINDOW.



2410687 S00061526141_V1

Angle of View
Figure 203/09-20-00-990-803

EFFECTIVITY
SIA ALL

D633AM101-SIA

09-20-00

Page 212
 May 15/2022