

Vehicle Standard Specifications

MODEL	FTR Diesel
GVWR / GCWR	25,950 lbs. / 30,000 lbs.
WB	152 in., 170 in., 188 in., 200 in., 212 in., 224 in., 236 in., 248 in.
CA	127 in., 145 in., 163 in., 175 in., 187 in., 199 in., 211 in., 223 in.
ENGINE	Cummins B6.7 diesel engine, 6-cylinder, turbocharged, inter-cooled, EGR cooler, high pressure common rail fuel system, and single module aftertreatment.
MODEL/DISPLACEMENT	B6.7 / 408 CID (6.7L)
HP (GROSS)	260 HP at 2400 RPM
TORQUE (GROSS)	660 lb.-ft. torque at 1600 RPM
EQUIPMENT	Dry element air cleaner with vertical intake; 2 rows 679 in ² radiator; 9 blade 20.1 in. diameter fan with viscous drive. Cold weather starting device and an oil cooler. Engine oil level check switch and light. Engine warning system with audible warning for low oil pressure, high coolant temperature, and low coolant level. Engine cruise control function. Coolant temperature and low coolant level.
TRANSMISSION	Allison 2550 RDS 6 speed automatic transmission with parking pawl. A single PTO opening on the left hand side of the transmission with a maximum torque value of 250 lb-ft.
STEERING	Integral power steering. Tilt and telescoping steering column. Steering ratio of 22.4:1
FRONT AXLE	Reverse Elliot "I"-beam type steer axle rated at 12,000 lbs. Dana E1254-W
FRONT SUSPENSION	Semi-elliptical steel alloy tapered leaf springs with stabilizer bar and shock absorbers rated at 12,000 lbs.
FRONT GAWR	11R22.5G Tires - 12,000 lbs. 255/70R22.5H Tires - 11,000 lbs.
REAR AXLE	Single-speed, 19,000 lbs. capacity drive axle. Dana S19-140
REAR SUSPENSION	Mult-leaf semi-elliptical steel alloy spring suspension rated at 21,000 lbs. Hendrickson HAS-230 air spring suspension with single leveling valve, dual shock absorbers, and an in cab dump/fill switch rated at 23,000 lbs.
REAR GAWR	19,000 lbs.
WHEELS	22.5 x 8.25 inch 10 hole steel disc wheels, painted white. 22.5 x 8.25 inch 10 hole aluminum disc wheels.
TIRES	11R22.5G LRR (Low Rolling Resistance) tubeless steel belted radials, premium highway front tread and premium highway traction rear tread. 255/70R22.5H LRR (Low Rolling Resistance) Low Profile, tubeless steel belted radials, premium highway front tread and premium highway traction rear tread.
BRAKES	Dual circuit S-CAM drum air service brakes with 4 channel anti-lock brake system. An air operated exhaust brake, air controlled parking brake, heated air dryer, and automatic slack adjusters are standard.
FUEL TANK	50 / 100 gal. (depending on chassis wheelbase) rectangular aluminum fuel tank mounted on left hand frame. Includes a fuel water separator with indicator light.
FRAME	Ladder type channel section straight frame rail, 33.5 in. wide along the total length of the frame. Yield strength 80,000 psi; Section Modulus 12.69 in ³ , RBM 1,015,000 lb-in.
CAB	All steel low cab forward, BBC 81.5 in, 45 degree mechanical tilt with torsion assist.
EQUIPMENT	TRICOT breathable cloth covered high back air ride driver's seat with rigid passenger seat and center seat with fold down back. Dual cab mounted exterior mirrors with integral convex mirror and a right hand side mounted side cross mirror. Tilt and telescoping steering column. Power windows and door locks, floor mats, tinted glass, air conditioning, AM/FM/CD stereo radio with aux. input, USB, Bluetooth. Rear body dome lamp switch. Cab latch switch with indicator and buzzer.
ELECTRICAL	12 Volt, negative ground, dual maintenance free batteries with threaded posts, 750 CCA each, 160 Amp alternator with integral regulator.
OPTIONS	See last page for options.

Note: These selected specifications are subject to change without notice

Vehicle Dimensions

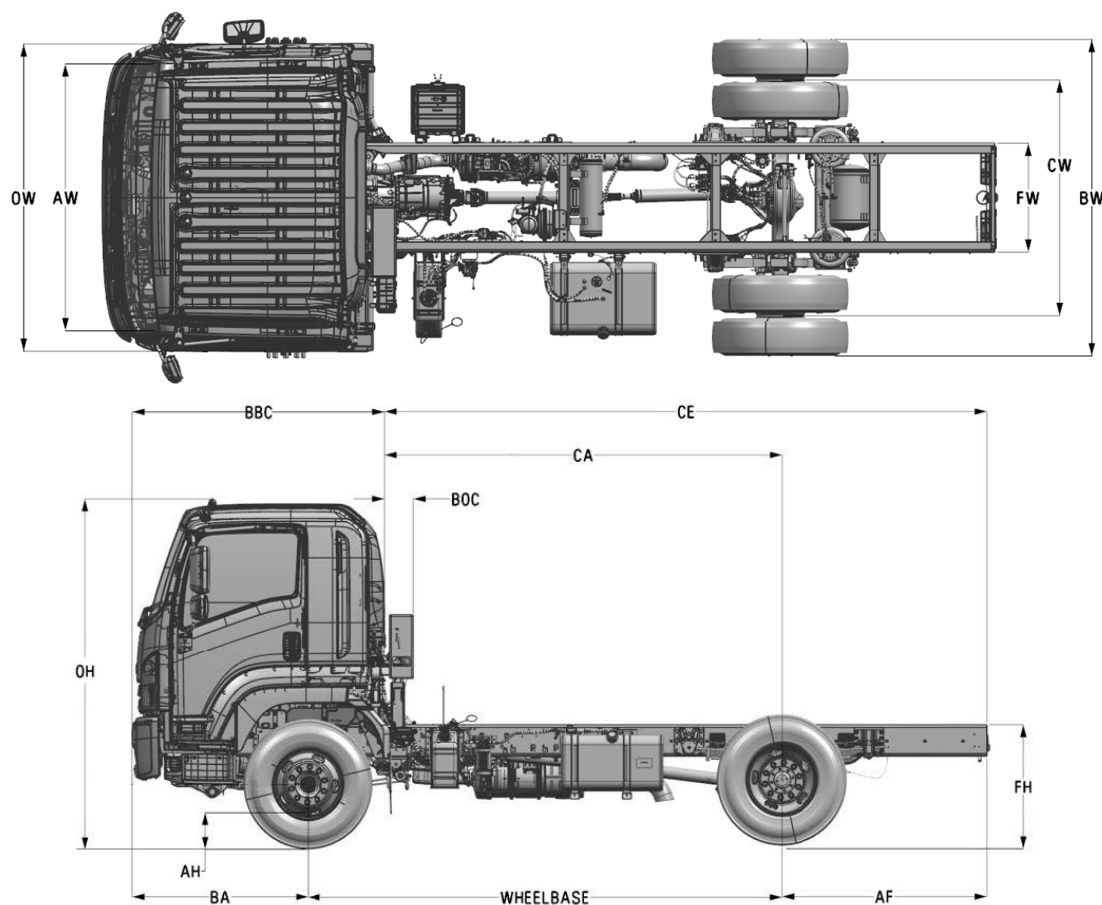


Figure 1 - F-Series Diesel Cab Chassis Dimensions (air suspension pictured)

CHASSIS DIMENSIONS (in)						
MODEL	WB	CA ^[1]	CE ^[2]	AF	FL	OAL
MT1	152	127	192.9	65.9	270.5	274.4
MT2	170	145	220	75	297.6	301.5
MT3	188	163	247	84.1	324.6	328.5
MT4	200	175	264.9	90	342.5	346.4
MT5	212	187	283.1	96.1	360.6	364.6
MT6	224	199	301	102	378.5	382.5
MT7	236	211	319.1	108.1	396.7	400.6
MT8	248	223	337	114	414.6	418.5
DIMENSION CONSTANTS (in)						
AW = Front axle track					81.1	
BA = Front bumper to centerline of axle					56.5	
BBC = Bumper to back of cab					81.5	
BOC = Back of cab clearance					10.4	
BW = Overall width across rear axle					96	
CW = Rear axle track					72.2	
FW = Frame width					33.5	
OW = Overall width across cab (without mirrors)					93.5	
DIMENSIONS FOR 11R22.5G TIRES BY SUSPENSION TYPE (in.)				MULTI-LEAF	AIR ^[6]	
AH = Ground to bottom of axle				10		
FH = Frame height (unladen) at E.O.F. ^[3]				42.5	38.2	
FH = Frame height (unladen) at R/A ^[4]				41	38.2	
FH = Frame height (laden) at R/A ^[5]				37.5	38.2	
OH = Overall height (without clearance lights)				112	108.6	
DIMENSIONS FOR 255/70R22.5H TIRES BY SUSPENSION TYPE (in.)				MULTI-LEAF	AIR ^[6]	
AH = Ground to bottom of axle				7.7		
FH = Frame height (unladen) at E.O.F. ^[3]				39.9	35.9	
FH = Frame height (unladen) at R/A ^[4]				39.2	35.9	
FH = Frame height (laden) at R/A ^[5]				36.4	35.9	
OH = Overall height (without clearance lights)				110.2	107	

Technical Notes:

[1] Effective CA is CA less BOC.

[2] Effective CE is CE less BOC.

[3] Measured at the end of the frame from the top of the frame to the ground at curb weight.

[4] Measured at the rear axle from the top of the frame to the ground with the chassis at curb weight.

[5] Measured at the rear axle from the top of the frame to the ground with the chassis loaded to the GVWR.

[6] With the air suspension in the dump position, frame height will be reduced by 2.9 inches.

Vehicle Weights and Ratings

CHASSIS WEIGHT RATINGS									
Description		Tires				Capacity (lb)			
Front GAWR		11R22.5G				12,000			
		255/70R22.5H				11,000			
Rear GAWR		ALL TIRE OPTIONS				19,000			
GVWR Designed Maximum						25,950			
GCWR Combined Maximum						30,000			

CURB WEIGHTS AND PAYLOAD									
COC	OCC	WB (in)	Fuel Tank Capacity (gal)	Tire Size	Final Ratio	Front (lb)	Rear (lb)	Total (lb)	Payload (lb)
FTR Standard Tires - Leaf Suspension									
MT1	G1	152	50	11R22.5	5.57	6575	3668	10243	15707
MT2	G1	170	50			6650	3671	10321	15629
MT3	G1	188	50			6724	3780	10504	15446
MT3	G2	188	100			6773	3852	10625	15325
MT4	G1	200	50			6823	3925	10748	15202
MT4	G2	200	100			6872	3997	10869	15081
MT5	G1	212	50			6850	3986	10837	15114
MT5	G2	212	100			6912	4046	10958	14993
MT6	G1	224	50			6973	4108	11081	14870
MT6	G2	224	100			7031	4170	11202	14749
MT7	G2	236	100			7093	4231	11324	14627
MT8	G2	248	100			7153	4292	11445	14505
FTR Standard Tires - Air Suspension									
MT1	G3	152	50	11R22.5	5.57	6575	3504	10079	15871
MT2	G3	170	50			6650	3507	10157	15793
MT3	G3	188	50			6724	3616	10340	15610
MT3	G4	188	100			6773	3688	10461	15489
MT4	G3	200	50			6823	3761	10584	15366
MT4	G4	200	100			6872	3833	10705	15245
MT5	G3	212	50			6850	3822	10673	15278
MT5	G4	212	100			6912	3882	10794	15157
MT6	G3	224	50			6973	3944	10917	15034
MT6	G4	224	100			7031	4006	11038	14913
MT7	G4	236	100			7093	4067	11160	14791
MT8	G4	248	100			7153	4128	11281	14669
FTR Low Profile Tires - Leaf Suspension									
MT1	G5	152	50	255/70R22.5	4.88	6503	3515	10018	15932
MT2	G5	170	50			6578	3518	10096	15854
MT3	G5	188	50			6652	3627	10279	15671
MT3	G6	188	100			6701	3699	10400	15550
MT4	G5	200	50			6751	3772	10523	15427
MT4	G6	200	100			6800	3844	10644	15306
MT5	G5	212	50			6778	3833	10612	15339
MT5	G6	212	100			6840	3893	10733	15218
MT6	G5	224	50			6901	3955	10856	15095
MT6	G6	224	100			6959	4017	10977	14974
MT7	G6	236	100			7021	4078	11099	14852
MT8	G6	248	100			7081	4139	11220	14730
FTR Low Profile Tires - Air Suspension									
MT1	G7	152	50	255/70R22.5	4.88	6503	3351	9854	16096
MT2	G7	170	50			6578	3354	9932	16018
MT3	G7	188	50			6652	3463	10115	15835
MT3	G8	188	100			6701	3535	10236	15714
MT4	G7	200	50			6751	3608	10359	15591
MT4	G8	200	100			6800	3680	10480	15470
MT5	G7	212	50			6778	3669	10448	15503
MT5	G8	212	100			6840	3729	10569	15382
MT6	G7	224	50			6901	3791	10692	15259
MT6	G8	224	100			6959	3853	10813	15138
MT7	G8	236	100			7021	3914	10935	15016
MT8	G8	248	100			7081	3975	11056	14894

NOTES: [1] Curb weights reflect standard equipment and fuel, but no driver or payload.

[2] Payload weight is the allowed maximum for equipment, body, payload and driver and is calculated by subtracting chassis curb weight from the GVWR.

Vehicle Weights and Ratings

CHASSIS WEIGHT RATINGS		
Description	Tires	Capacity (lb)
Front GAWR	11R22.5G	12,000
	255/70R22.5H	11,000
Rear GAWR	ALL TIRE OPTIONS	19,000
GVWR Designed Maximum		25,950
GCWR Combined Maximum		30,000

CURB WEIGHTS AND PAYLOAD									
COC	OCC	WB (in)	Fuel Tank Capacity (gal)	Tire Size	Final Ratio	Front (lb)	Rear (lb)	Total (lb)	Payload (lb)
FTR Standard Tires - Leaf Suspension - Aluminum Wheels									
MT1	A1	152	50	11R22.5	5.57	6519	3556	10075	15875
MT2	A1	170	50			6594	3559	10153	15797
MT3	A1	188	50			6668	3668	10336	15614
MT3	A2	188	100			6717	3740	10457	15493
MT4	A1	200	50			6767	3813	10580	15370
MT4	A2	200	100			6816	3885	10701	15249
MT5	A1	212	50			6794	3874	10669	15282
MT5	A2	212	100			6856	3934	10790	15161
MT6	A1	224	50			6917	3996	10913	15038
MT6	A2	224	100			6975	4058	11034	14917
MT7	A2	236	100			7037	4119	11156	14795
MT8	A2	248	100			7097	4180	11277	14673
FTR Standard Tires - Air Suspension - Aluminum Wheels									
MT1	A3	152	50	11R22.5	5.57	6519	3392	9911	16039
MT2	A3	170	50			6594	3395	9989	15961
MT3	A3	188	50			6668	3504	10172	15778
MT3	A4	188	100			6717	3576	10293	15657
MT4	A3	200	50			6767	3649	10416	15534
MT4	A4	200	100			6816	3721	10537	15413
MT5	A3	212	50			6794	3710	10505	15446
MT5	A4	212	100			6856	3770	10626	15325
MT6	A3	224	50			6917	3832	10749	15202
MT6	A4	224	100			6975	3894	10870	15081
MT7	A4	236	100			7037	3955	10992	14959
MT8	A4	248	100			7097	4016	11113	14837
FTR Low Profile Tires - Leaf Suspension - Aluminum Wheels									
MT1	A5	152	50	255/70R22.5	4.88	6447	3403	9850	16100
MT2	A5	170	50			6522	3406	9928	16022
MT3	A5	188	50			6596	3515	10111	15839
MT3	A6	188	100			6645	3587	10232	15718
MT4	A5	200	50			6695	3660	10355	15595
MT4	A6	200	100			6744	3732	10476	15474
MT5	A5	212	50			6722	3721	10444	15507
MT5	A6	212	100			6784	3781	10565	15386
MT6	A5	224	50			6845	3843	10688	15263
MT6	A6	224	100			6903	3905	10809	15142
MT7	A6	236	100			6965	3966	10931	15020
MT8	A6	248	100			7025	4027	11052	14898
FTR Low Profile Tires - Air Suspension - Aluminum Wheels									
MT1	A7	152	50	255/70R22.5	4.88	6447	3239	9686	16264
MT2	A7	170	50			6522	3242	9764	16186
MT3	A7	188	50			6596	3351	9947	16003
MT3	A8	188	100			6645	3423	10068	15882
MT4	A7	200	50			6695	3496	10191	15759
MT4	A8	200	100			6744	3568	10312	15638
MT5	A7	212	50			6722	3557	10280	15671
MT5	A8	212	100			6784	3617	10401	15550
MT6	A7	224	50			6845	3679	10524	15427
MT6	A8	224	100			6903	3741	10645	15306
MT7	A8	236	100			6965	3802	10767	15184
MT8	A8	248	100			7025	3863	10888	15062

NOTES: [1] Curb weights reflect standard equipment and fuel, but no driver or payload.

[2] Payload weight is the allowed maximum for equipment, body, payload and driver and is calculated by subtracting chassis curb weight from the GVWR.

Model Description

The F-Series Diesel features a low cab forward design that is ideally suited for inter-city type applications. The low cab forward design minimizes overall length for a given body length and in conjunction with the set back front axle positioning provides excellent weight distribution. The 50 degrees inside wheel cut angle coupled with integral power steering make it an extremely maneuverable truck.

Engine

The F-Series Diesel is powered by the Cummins B6.7 turbocharged 6-cylinder diesel engine with a displacement of 408 cubic inches (6.7 liters). This engine features a variable geometry turbocharger that optimizes fuel economy and braking power, a high-pressure common rail fuel system that ensures performance and efficiency at all rpm ranges, and a single module aftertreatment device mounted below the frame rail to help prevent interference during equipment installation.

Engine Data: Cummins B6.7L

Power:	260 HP @ 2400 RPM
Torque:	660 lb.-ft. @ 1600 RPM
Displacement:	408 CID/6.7L
Cylinder Bore:	4.21 in. (107 mm)
Cylinder Stroke:	4.88 in. (124 mm)
Cylinders:	6
Air Compressor	17 CFM @ 2400 RPM

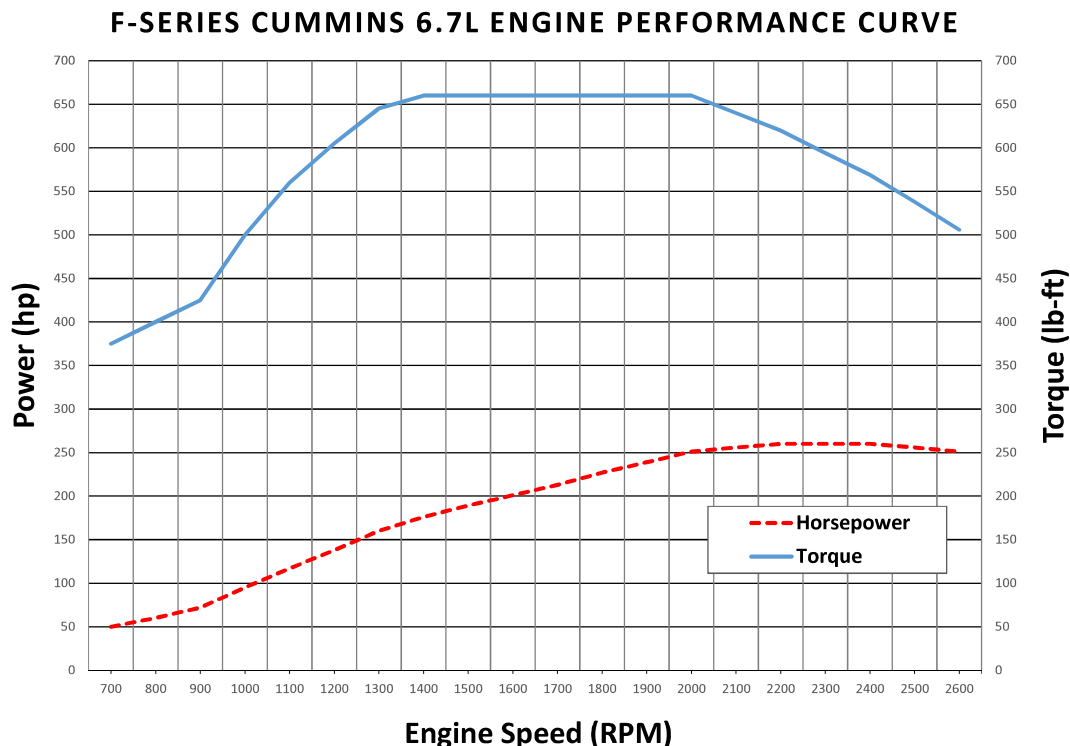


Figure 2 - F-Series Cummins B6.7 Engine Performance Curve

Engine Features

The 2022 model year Isuzu F-Series introduces the popular Cummins B6.7 engine to the Isuzu Class 6 and 7 model lineup. This powerful 6.7L turbocharged inline 6-cylinder engine brings improved horsepower and torque to the F-Series chassis, while providing a fuel-efficient and reliable power plant. This engine features a variable geometry turbocharger designed to optimize fuel economy and braking power, a high-pressure common rail fuel system that ensures performance and efficiency at all rpm ranges, and a single module aftertreatment device mounted below the frame rail to help accommodate a variety of equipment and body applications.

Single Module Exhaust Aftertreatment System

The Cummins Single Module exhaust aftertreatment system was developed specifically to meet both customer needs and emission standards alike. The single-cylinder design employs advanced DPF and SCR catalyst technologies, which improve particulate matter and NOx reduction capabilities. Simplified packaging and optimized on-board diagnostics (OBD) also help create a more robust and reliable system. The compact packaging design allows customers more flexibility when mounting bodies and vocational equipment along the length of the chassis frame rails. The use of advanced DPF catalyst technologies has allowed for a smaller filter, while also improving ash capacity to allow customers to go further between DPF service events when compared to previous Cummins exhaust systems.

Exhaust Routing Description

The exhaust system routes to a horizontally single module package containing both a DPF and SCR chamber on the right side of the chassis. The exhaust tail pipe then exits to the rear through a central exit.

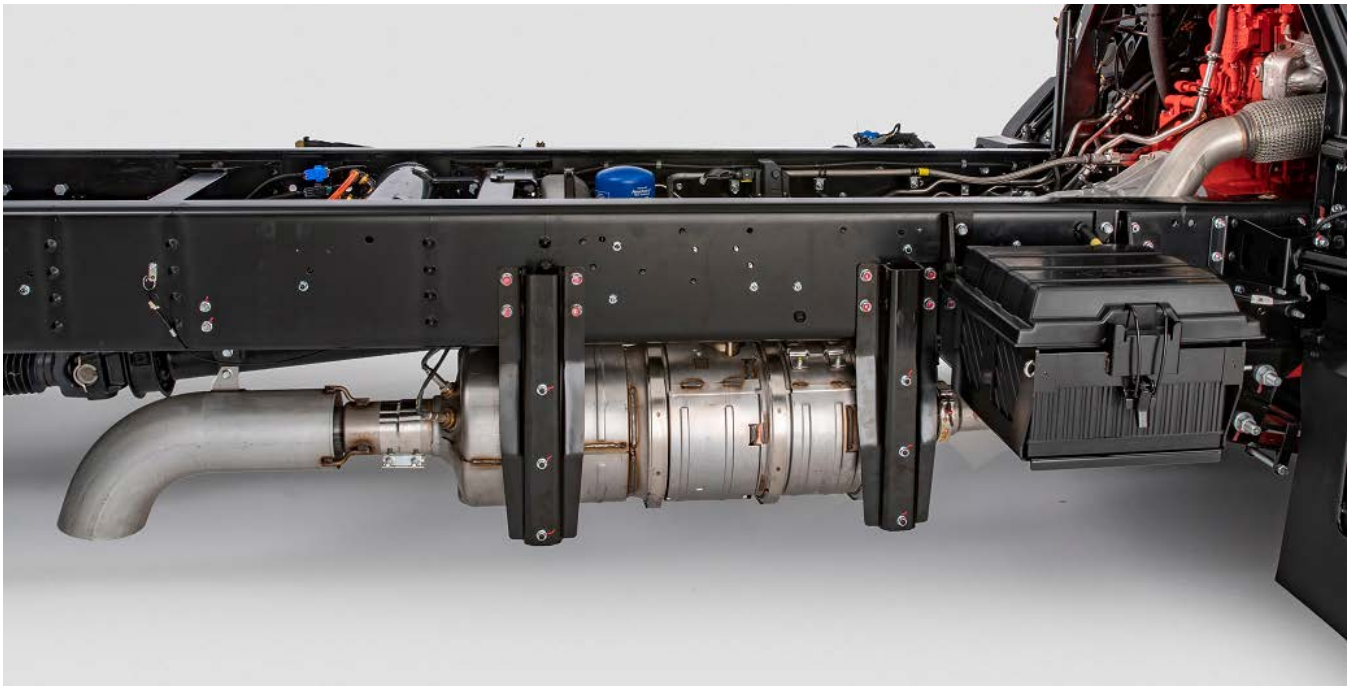


Figure 3 - F-Series Cummins B6.7 Exhaust Aftertreatment

Air Cleaner System

Donaldson air cleaner canister with an 11.0-inch diameter paper element. The air cleaner snorkel is incorporated into the back of the cab and incorporates a resonator. The Air cleaner system is standard with an air restriction indicator in the instrument cluster that will indicate when the element is due for service. This will help ensure maintenance is performed at the correct time.

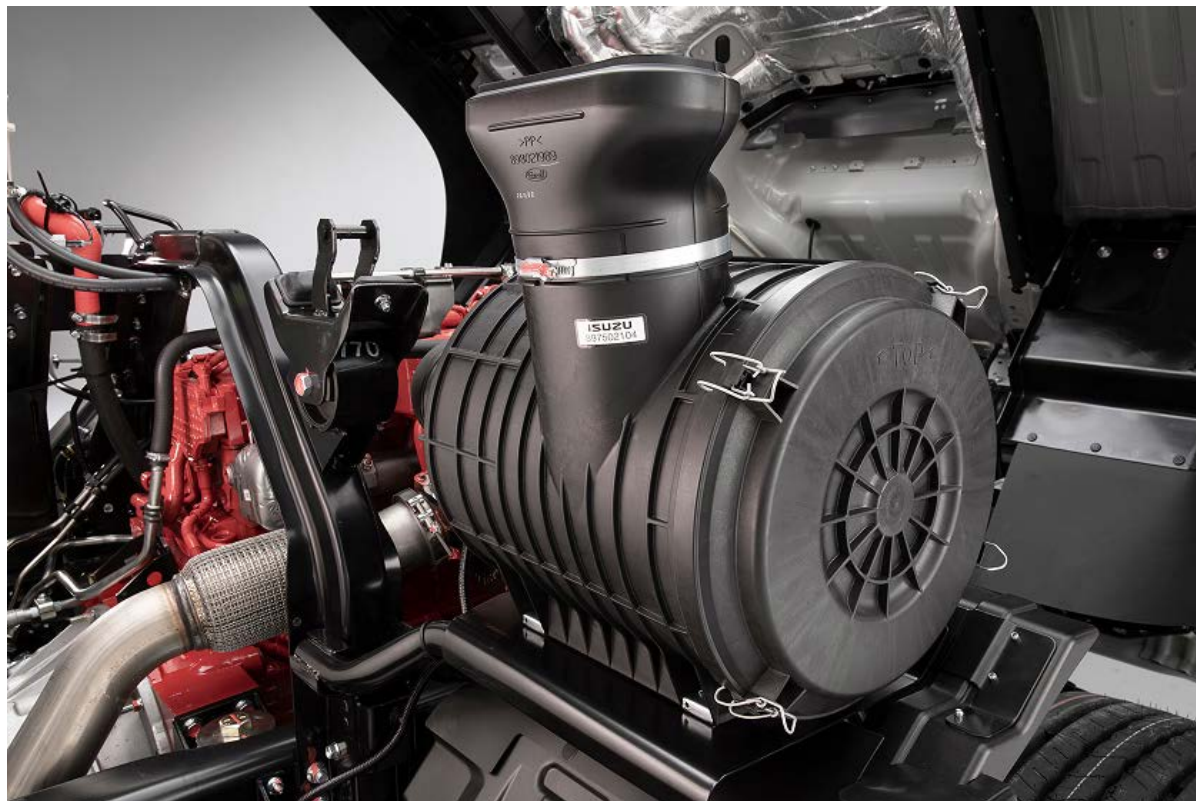


Figure 4 - F-Series Cummins B6.7 Air Cleaner

Engine Warning System

The Cummins B6.7 engine is standard with an engine warning system that will provide an audible warning in the event of detection of a Low oil pressure, High coolant temperature and Low coolant level event. As a port installed option in addition to the audible warning the engine warning system can shut the engine down 30 seconds after an audible warning is sounded. This delay will allow the driver to safely move the vehicle off of the road.

Fuel System

The fuel system is standard with a rectangular aluminum fuel tank mounted on the left hand frame rail. The fuel system features dual fuel filters, one mounted on the frame, and the other mounted on the engine. This dual filter arrangement significantly increases fuel filtration and will extend the life of fuel system components. The engine-mounted fuel filter is pressurized, which allows for a fine micron rating and significantly improved filtration performance relative to previous models. The frame mounted fuel filter has a coarse mesh which prevents large contaminants from entering the fuel pump. The frame mounted filter also incorporates a fuel/water separator and a hand operated fuel primer pump should priming the engine be required.

Injection System

The Cummins B6.7 engine features a High Pressure Common Rail (HPCR) Fuel System designed to deliver superior performance even within low engine rpm ranges. This system also enables multiple injection events per cycle for smoother operation and improved fuel efficiency.

Cooling System

The water pump is a belt driven centrifugal unit. The cooling system has a capacity of 7.04 gallons. The radiator has an integrated transmission oil cooler. The radiator is a single row tube and corrugated fin type with a frontal area of 748 in². The fan is 11-blade type, 24.8 inch (630 mm) diameter, with an electro-viscous drive hub to reduce noise and increase engine fuel economy.

Cold Start

As an aid for cold weather starting, the Cummins B6.7 is equipped with a grid heater located in the intake manifold. This provides for easy starting in cold weather climate areas.

Lubrication

The engine lubrication system features a gear-driven pump which provides direct lubrication of the main, connecting rod and cam shaft bearings. The piston crowns are also oil cooled. The oil pump capacity is high to provide increased oiling for reduced wear and improved reliability. The Cummins B6.7 engine also features a plate type oil cooler in the water jacket to help control oil temperature. A full flow oil filter is standard. The engine uses only low ash oil as specified in the owner's manual for vehicles equipped with SCR and Diesel Particulate Filter emission systems. For oil change intervals and capacity information please reference the vehicle's owner's manual. The Cummins B6.7 also features an Open Crankcase Ventilation (OCV) system to control blow by emissions.

Allison 2550 RDS Automatic Transmission

The Allison 2550 RDS is the standard transmission in the FTR Diesel. The key drivetrain components in the F-Series Diesel chassis (engine, transmission and rear axle) are all engineered and matched to operate as a team to provide optimal performance and economy.

Allison Automatic Transmission**Model: RDS2550****Gears and Ratios**

1st	3.51:1
2nd	1.90:1
3rd	1.44:1
4th	1.00:1
5th	0.74:1
6th	0.64:1
Rev.	5.09:1
A/T Fluid	14 liters of Castrol TranSynd Oil
Weight/Wet	362 lbs. (164 kg)

Other Specifications:

PTO:	Automatic torque converter lockup in stationary PTO mode.
Bolt Pattern:	SAE 6-bolt PTO opening
PTO Rating:	Maximum 250 lb.-ft.

Features:

- 6-speed double overdrive with lock-up converter in 2nd, 3rd, 4th, 5th and 6th gear, acceleration and deceleration.
- Electronic microprocessor shift control.
- 1.730:1 torque converter multiplication ratio.
- Integrated parking pawl.

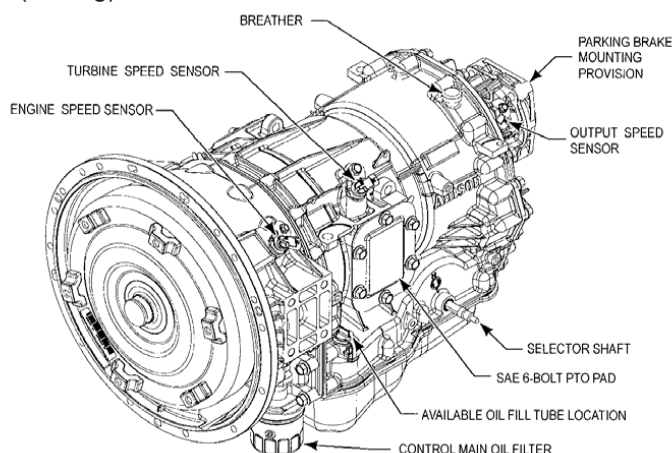


Figure 5 - F-Series Diesel Allison Transmission

Propeller Shaft

The propeller shaft assembly is made up of shafts of various lengths. The propeller shaft center support bearings are a grease seal type with a dust seal, and are attached to the rear of the front/intermediate shafts and mounted to the cross member by a rubber cushion and steel support bracket. The sliding spline, located on the front portion of the rear shaft, is an involute spline type. Attachment of the propeller shaft assembly is by yokes with four bolts each.



Figure 6 - F-Series Propeller Shafts

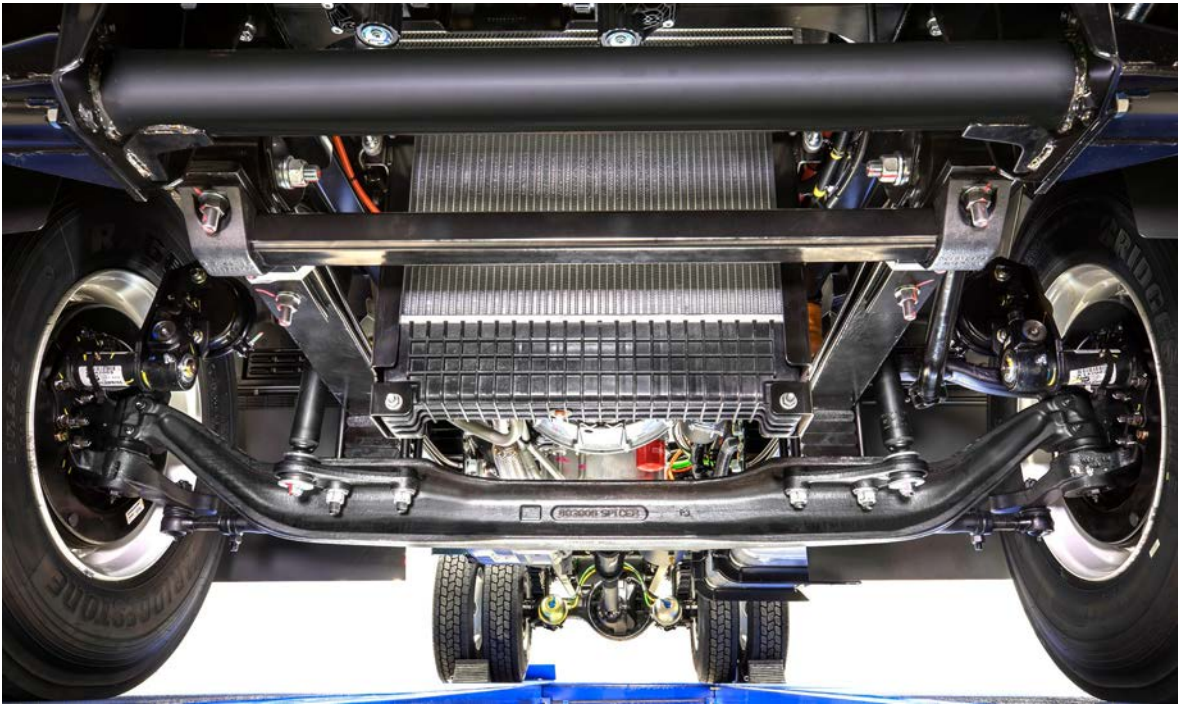


Figure 7 - Front Axle and Suspension

Front Axle

The F-Series Diesel front axle is a drop forged Steel, reverse Elliot, "I"-Beam.

Front Axle Specifications:

Type	Steel drop forged Reverse Elliot "I"-Beam Dana model E1254-W
Rated Capacity	12,000 lbs.
Tread Width	65.8 in.
King Pin Type	Bronze Bushings
Thrust Bearing	Ball
Hub Lubrication	Tapered Roller SAE 50W

Front Suspension

The front suspension is tapered leaf springs with increased spring rates for higher capacity with stabilizer bar and shock absorbers.

Front Suspension Specifications:

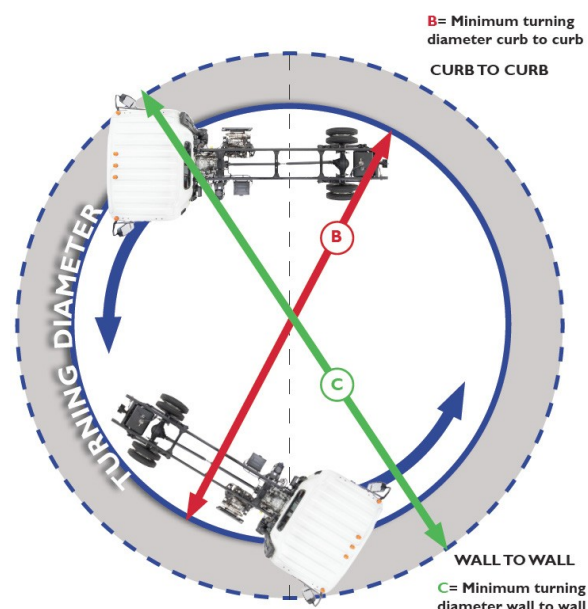
Type	Semi Elliptical
Capacity	12,000 lbs.
Effective Length	59.8 in
Width	3.5 in
Deflection Rate	1249.4 lbs./in. (218.8 N/mm)
No. Leaves	2
Leaf Thickness	2 X 0.866 in.
Bar Diameter	1.65 in
Thickness	0.16 in

Steering System

The F-Series Diesel chassis is equipped with a high capacity integral power steering with a 22.4:1 gear ratio. The system also features a tilt and telescopic steering column that allows adjustment of the steering wheel location for driver comfort and convenience.

Turning Diameters

The F-Series Diesel's steering also features a 50 degree inside wheel cut angle. This coupled with the integral power steering, makes the F-Series Diesel an extremely maneuverable truck.



B Curb-to-Curb	Tire	Wheelbase (in)							
		152	170	188	200	212	224	236	248
		43.7 ft	47.4 ft	51.8 ft	54.7 ft	56.5 ft	59.3 ft	62.2 ft	65.0 ft
C Wall-to-Wall	Bumper	48.7 ft	52.5 ft	56.9 ft	59.9 ft	61.7 ft	64.6 ft	67.5 ft	70.3 ft
	96" mirrors	46.6 ft	52.5 ft	56.9 ft	59.8 ft	61.6 ft	64.5 ft	67.3 ft	70.2 ft
	102" mirrors	49.0 ft	52.9 ft	57.2 ft	60.2 ft	62.0 ft	64.8 ft	67.7 ft	70.6 ft

Figure 8 - F-Series Diesel Turning Circle Diagram

Rear Axle and Suspension

Rear Axle

The FTR Diesel chassis has full floating rear axle with a banjo type housing and separable carrier. The wheel bearings are tapered roller type for long service life and feature oil bath lubrication using a synthetic lubricant from the factory.

Rear Axle Specifications	
Model:	Dana S19-140
Type:	Single Reduction
Rated Capacity:	19,000 lbs.
Tread Width:	65.8 in.
Gear Type:	Hypoid
Ring Gear Diameter:	12.6 in.
Differential Type:	4 Pinion Gear
Ratio:	5.57 (11R22.5 Tires)
	4.88 (255/70R22.5 Tires)
Hub Lubrication:	Oil
Oil Type:	Synthetic 75W-140

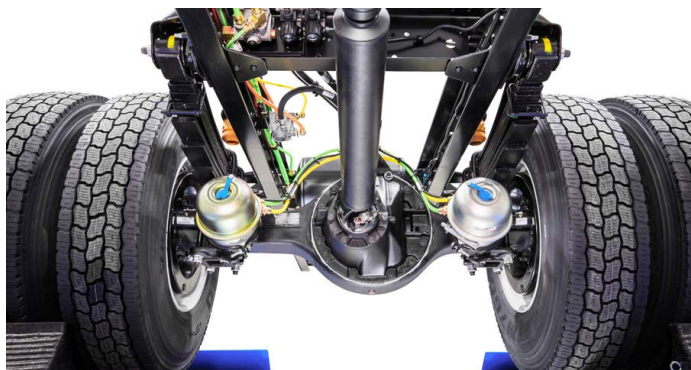


Figure 9 - FTR Diesel Rear Axle, Differential, and Suspension

Rear Multi Leaf Spring Suspension

The rear multi leaf suspension consists of a polyurethane spring aid and rubber bump stop attached to the frame above the spring center. The long effective spring length design provides excellent ride characteristics.



Figure 10 - Rear Multi Leaf Spring Suspension

Multi Leaf Spring Suspension Specifications	
Type:	Multi Leaf Spring
Capacity:	21,000 lbs.
Main Springs	
No. Leaves:	9
Effective Length:	63.18 in.
Width:	2.9 in.
Leaf Thickness:	4 X 0.812 in.
	4 X 0.446 in.
	1 X 0.668 in.
Deflection Rate:	1054.1 lbs/in (184.6 N/mm)
Auxiliary Springs	
No. Leaves:	1
Effective Length:	43.85 in.
Width:	2.9 in.
Leaf Thickness:	0.748 in.
Deflection Rate:	3,447 lbs/in (609 N/mm)

Rear Air Spring Suspension

The Hendrickson HAS-230 rear air suspension consists of dual large volume air springs, dual shock absorbers, and a single leveling valve that adjust to changing road conditions for a premium quality ride. Wide seats provide a secure axle connection and ensure axle integrity.

The F-Series Diesel's air suspension includes a dash mounted control switch (pictured below). This switch will fully dump or fully fill the air suspension when toggled. Fully filling the air suspension is required prior to driving the chassis.



Figure 11 - Dump/Fill Toggle Switch

Air Spring Suspension Specifications	
Type:	Air Spring
Capacity:	23,000 lbs.
Leveling Valve:	Single



Figure 12 - Rear Air Spring Suspension

Frame

The frame in the F-Series Diesel is a ladder-type, channel section, straight rail from bumper to end of frame with a rivet-less top flange. The frame material is a heat treated, carbon manganese, low alloy steel with good weldability. The chassis is equipped with a steel front bumper for greater cab protection and improved styling.

Section modulus: 12.69 in³; RBM: 1,015,000 lb-in; Strength: 80,000 psi

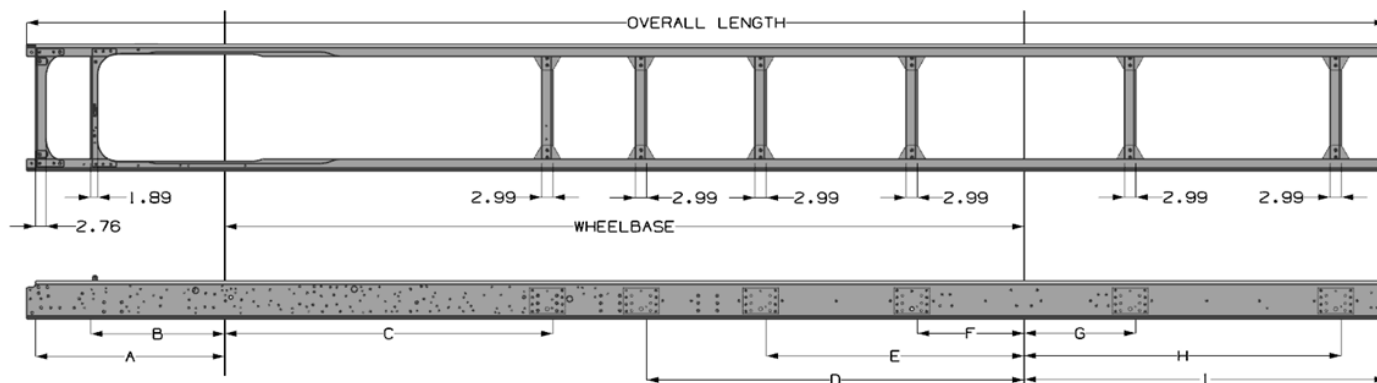


Figure 13 - F-Series Diesel Frame

Fuel Tank

The fuel tank is aluminum with a rectangular profile, and the standard mounting location is the left hand frame rail. A 50-gallon tank is optional on all wheelbases excluding 236" and 248". A 100-gallon tank is optional on all wheelbases excluding 152" and 170".



Figure 14 – F-Series Side Fuel Tank

Brake System

The service brake system is a full air dual circuit system. The F-Series is standard with front and rear S-CAM drum brakes. The system incorporates an Anti-lock Braking System (ABS). The ABS is designed to avoid brake lock up and ensure the stability of the vehicle during deceleration for a stop. The system has a fail-safe mode that will turn the ABS brake system off if a malfunction in the system is detected. The ABS system has a self-diagnostic function that will improve ease of serviceability of the system.

ABS Brake System Operation

The ABS control unit increases, decreases, or keeps air pressure the same by operating the brake actuator unit in response to the wheel speed sensor signals. The control unit also calculates wheel speed, wheel deceleration and vehicle speed. When the brakes are applied in a manner that the wheel rapidly decelerates and the difference between wheel speed and vehicle speed becomes larger than a predetermined value, the control unit senses that the wheel is about to lock up and the unit keeps the air pressure as it is. If the wheel further decelerates the control unit senses that the wheel is locking up and reduces the brake air pressure. When the control unit senses that the wheel is unlocked, the unit maintains or increases brake air pressure repeatedly.

Air Compressor

The air pressure for the system is supplied via a compressor pump that is driven off of the rear gear drive of the engine. The system has a Bendix AD-IS heated air dryer with a purge valve silencer and drain valves on both tanks.

Compressor Displacement: 17 CFM at 2400 RPM engine speed.

Brake Specifications:

GVWR	25,950 lb.
Model	Cab Chassis
Type	Full Air System - Dual Circuit

Front Drum:

Diameter	16.50 in
Width	5.00 in
Shoe Thickness Useable	0.25 in
Lining Area	154.3 in ²
Lining Material	Bendix ES420

Rear Drum:

Diameter	16.50 in
Width	7.00 in
Thickness	0.25 in
Lining Area	215.6 in ²
Lining Material	Bendix EES420



Figure 15 - Bendix Air Dryer

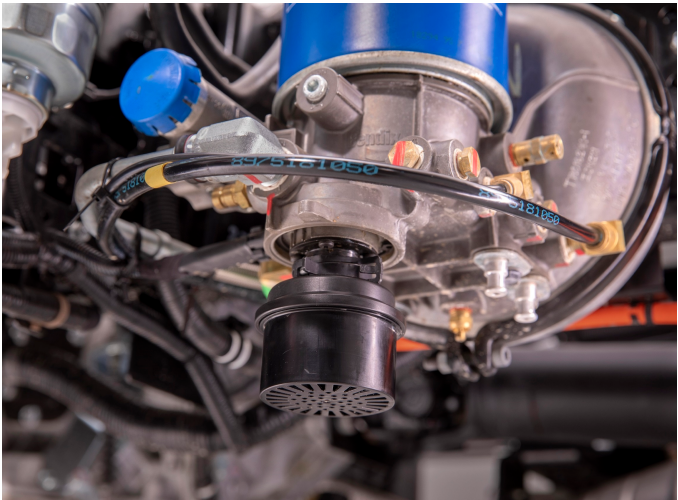


Figure 16 - Air Dryer Purge Valve Silencer

Electrical System

12V with negative ground

Batteries

Two 12V Group 31 750 CCA maintenance-free type batteries with threaded posts are wired in parallel. The individual battery has a 160-minute reserve capacity rating. The battery box has a lockable battery hold down to prevent theft.

Starter Motor

Reduction speed type solenoid controlled with over running clutch.

Lighting Specifications:

- Flush surface LED headlamps with integral parking light and turn signal
- Independent side turn signals and cornering lamps
- Combined rear lamps: turn signal, stop, and backup
- Identification/clearance lamp (shock mounted for extended bulb life)
- License plate lamp
- Day time running lights
- LED compatible flasher

Upfitter Connections:

- Back up alarm electrical connector
- Body mounting electrical connector
- Auxiliary power connector behind dash

Alternator: 160 amp output with internal regulator

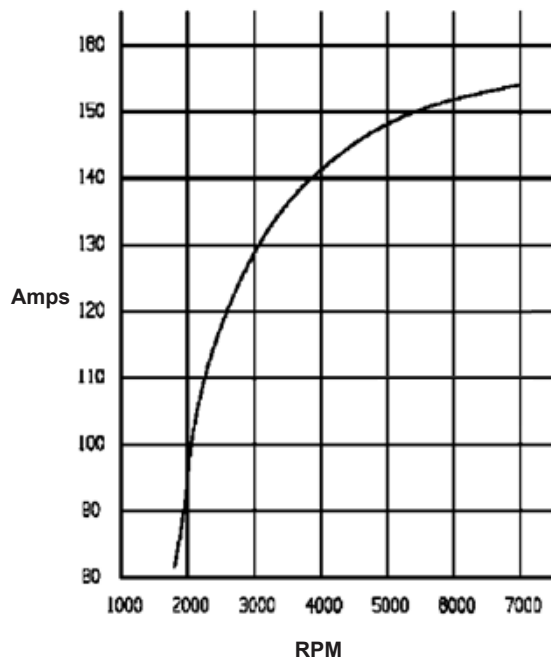


Figure 17: F-Series Alternator Output Curve

Standard Tire Specifications:	
Manufacturer ^[1] :	Bridgestone
	Continental
Type:	Low Rolling Resistance Tubeless Steel Radial
Size:	11R22.5G
Ply Rating:	14
Tread:	Highway rib (Front)
	Highway traction (Rear)
Maximum Rating per tire at 105 psi (cold inflation pressure):	5840 lbs. (Dual/Rear)
	6175 lbs. (Single/Front)
Rev per mile:	Bridgestone: 500
	Continental: 498

Standard Low Pro Tire Specifications:	
Manufacturer:	Yokohama
Type:	Low Profile Low Rolling Resistance Tubeless Steel Radial
Size:	255/70R22.5H
Ply Rating:	16
Tread:	Highway rib (Front)
	Highway traction (Rear)
Maximum Rating per tire at 120 psi (cold inflation pressure):	5070 lbs. (Dual/Rear)
	5510 lbs. (Single/Front)
Rev per mile:	570 (Front RY023)
	563 (Rear TY303)

Standard Painted Steel Wheel Specifications:	
Size:	22.5 in. x 8.25 in.
Bolt Holes:	10
Bolt Circle Diameter:	11.25 in
Outside Offset:	6.6 in
Rim Type:	15° DC, 2-piece welded
Manufacturer:	Accuride
FT/RR Nut Size:	1.6142 in (41 mm) Bud Hex
Rear Stud Size ^[2] :	0.8268 in (21 mm) Square
Nut/Stud Torque:	475 ft.-lb. (644 N-M)

Standard Aluminum Wheel Specifications:	
Size:	22.5 in. x 8.25 in.
Bolt Holes:	10
Bolt Circle Diameter:	11.25 in
Outside Offset:	6.6 in
Rim Type:	15° DC, 1-piece
Manufacturer:	Alcoa
FT/RR Nut Size:	1.6142 in (41 mm) Bud Hex
Rear Stud Size ^[2] :	0.8268 in (21 mm) Square
Nut/Stud Torque:	475 ft.-lb. (644 N-M)

Notes:

[1] Manufacturer specification is not permissible

[2] O.D. wrench size

Cab Features - Cab Over Engine Design

The F-Series cab design brings an exciting look to the product. Based on the "Hexapod Design Concept" the cab has been redesigned to meet new emerging market demands. Cab panels, radiator grill, headlights, and bumper are designed to embrace the design concept that brings maximum space to the cab interior while creating a bold look on the outside of the cab. The sleek design conveys a solid clean vehicle with a bold presence in the market place. These enhancements in the product continue to bring customer driven improvements in LCF design to the market place. The cab interior features improved driver comfort with ample head room, leg room, storage room, and a wider door opening and larger step for easier access to the cab. Once inside the driver is greeted by pleasing interior color scheme and enhanced vehicle information provided by the instrument cluster.

The low cab forward (LCF) design used by the F-Series Diesel has been recognized in urban centers throughout the world for the following features:

- More cargo space within a given overall length.
- Shorter overall length with a given body length.
- Small turn diameters.
- Better driver visibility.
- Ease of entry and exit. (Wider self-cleaning entry step and door opening with 90 degree door swing)

The Hexapod cab has been designed to meet all current and future market trends and offers additional value to the customer in many other areas.

Cab Exterior

The cabs exterior features a removable front service panel for easy access to wiper motor, wiper linkage, cab air intake filter, and electrical connections. An optional chrome grill is available. Cab door handles are the large paddle type that protect the door paint and are easy to operate by a gloved hand. The F-Series Diesel's cab mirrors include a flat 15 x 7.3 inch and a 7.7 x 7.4 inch convex mirror on each side of the cab. These mirrors are attached to breakaway stanchions with detents to help the mirrors return to the proper orientation. Mirrors can be ordered heated, with a remote control flat mirror, and with stanchions to accommodate up to 102" wide bodies. A fifth 12 x 7 inch mirror is mounted above the passenger side door serving as a side under mirror for pedestrian visibility.

Engine Accessibility

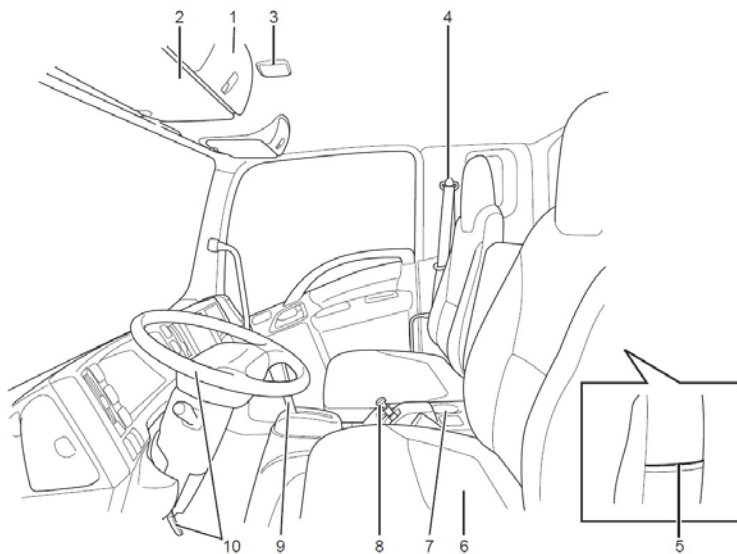
The FTR Diesel tilt cab design provides complete and easy access to the engine area for service. By following the procedure shown in the owners' manual the cab can be tilted a full 45 degrees with great ease on improved cab mounts. More engine access is provided with the tilt cab than by any conventional or van cabs offered by the competition. This ease of access allows quicker service that will translate to lower maintenance costs leading to a lower cost of operation for the LCF design. The cab floor is insulated to improve the drivers cab environment by reducing engine and noise and heat penetration into the cab interior.

Convenience of operation and service are highlights of the improved cab. Fuses and electrical relays are located behind a removable panel below the center of the dash. This location is within easy reach for access by the driver or a technician. The windshield washer bottle is located behind the front hood panel. The washer bottle feeds intermittent wet arm wipers that put the washer fluid directly on the windshield where it is needed. The cab roof cap is designed to channel water off of the roof to the side not down the windshield to improve driver visibility in wet weather. The windshield is bonded to the cab for increased cab rigidity, less wind noise, and no leaks. The windshield has a tinted upper area for improved visibility and safety. The dash mounted engine oil level check system allows the engine oil level to be quickly verified from inside the cab on a daily basis with the key in the off position. The coolant reservoir is located at the back of cab and is also easily checked without tilting the cab.



Figure 18: F-Series Diesel Engine Accessibility

Interior Cab Features



No.	Equipment Description
1	Overhead shelf
2	Sun visor
3	Dome light
4	Seat belt
5	Seatback pocket (driver's side)
6	Seat
7	Cup holder
8	Parking brake lever
9	Selector lever
10	Fully adjustable steering

Figure 19 - F-Series Driver Side Interior

The steering wheel is designed to provide maximum visibility of the instrument cluster. The column tilts and telescopes to adjust for varying driver profiles.

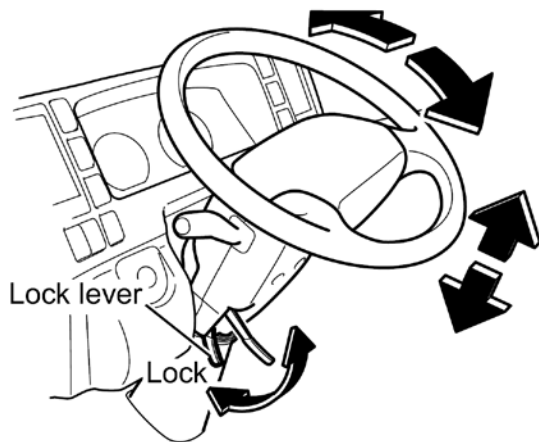


Figure 20 - F-Series Steering Column

The parking brake handle is located between the driver's seat and the center passenger seat. This location provides an unobstructed floor for increased driver comfort.

The rubber floor cover is durable and easy to maintain. Heavy duty floor mats are standard. The automotive style instrument panel has a low profile design for improved downward visibility. The cab is fully trimmed to provide a quieter environment. Two cup holders are mounted between the seats within convenient reach of the driver and will handle large convenience store cups. A slide out, dash mounted cup holder accommodates two smaller sized cups. The rear cab panel incorporates a coat hook for improved driver comfort.

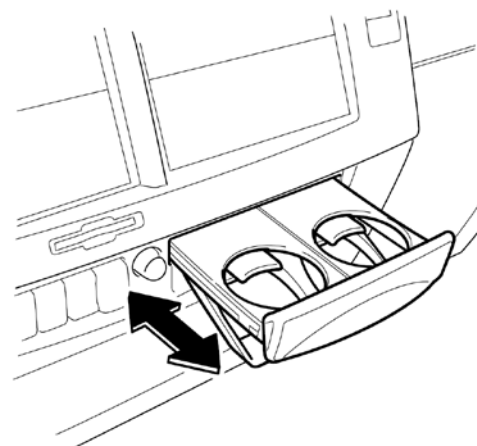
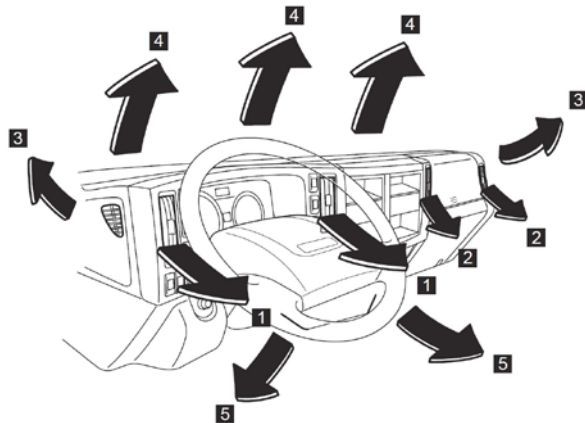


Figure 21 - F-Series Cup Holders

Cab Environmental Systems

The cab environmental system has been designed to provide enhanced air flow through the ventilation system in the cab. The system provides plenty of air flow and heat to keep the driver comfortable, ventilate the cab, and keep the windshield glass clear. The standard air conditioning system uses environmentally friendly 134a refrigerant. A larger air-conditioning condenser has been located vertically and raised for greater protection of this component for improved operation and less maintenance.



No.	Outlet	Features
1	Driver side outlet	Air flow direction is adjustable with the tab.
2	Passenger side outlet	Air flow direction is adjustable with the tab.
3	Door windows outlet	Air is delivered towards the door windows.
4	Windshield outlet	Air is delivered towards windshield
5	Foot outlet	Air is delivered towards the feet

Figure 22 - F-Series Diesel Cab Ventilation

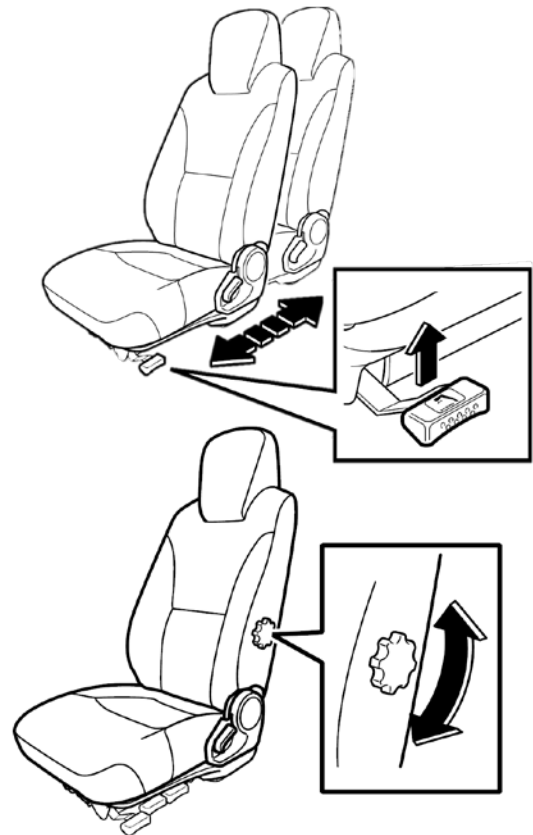


Figure 23 - F-Series Diesel Driver's Seat Features

Interior Trim Features

To enhance driver comfort the seat cushions have been designed for maximum support. The seat material is a durable Tricot flat woven material on the seat base and on the seat back. This seat material will provide a tough long lasting seat that breathes for enhanced driver comfort in hot or cold climates. The driver's seat fore and aft travel has been increased allowing more room to tilt and adjust the seat for maximum driver comfort. Adjustable lumbar support, a right side arm rest, and an air ride suspensions system have all been introduced as standard features on the F-Series Diesel's driver seat. A center seat adds room for a third passenger, and when folded doubles as a working surface and storage area.

Seat belt design has been enhanced for easier operation. A new interior dome light is installed for a brighter cab during night time operations. Additional storage for maps and other papers is provided in easy to reach door pockets, seat backs as well as several built in storage areas in the dash. Overhead shelves with latching doors are standard on the F-Series. In addition, there is plenty of extra storage space behind the seats of the F-Series full cab configuration.

Instrumentation

The instrument cluster includes a Multi Information Display (MID) in addition to the speedometer, tachometer, fuel gauges and temperature gauges, combined with the redesigned steering wheel, instrument visibility is greatly enhanced. The MID will provide information to driver that will enable him to improve his fuel economy, monitor the emission system and be alerted to warning messages from the engine. Frequently used switches are styled for easy operation, and illuminated for operation at night. ISO symbols are used on the switches and instrument panel for standard recognition of control components.

The combination switches are designed to fit naturally in the hand. Their function is clearly marked on the lever for easy recognition. The odometer has a three-way mode switch used to navigate the various information menus of the MID. The current operational status of the Diesel Particulate Filter (DPF) and levels of Diesel Exhaust Fluid (DEF) are also indicated on the MID.

Cornering lights are standard to improve night time visibility when the turn signals are operated and headlights are on. Cruise control is standard and the controls are post mounted for easier operation and greater driver comfort. PTO functions can also be accessed through the cruise control by the addition of the optional PTO/engine idle up switches on the dash or through connectors on the frame. An AM/FM/CD radio with Bluetooth is standard equipment. The dash also has a "5 DIN" opening suitable for other electronic equipment.

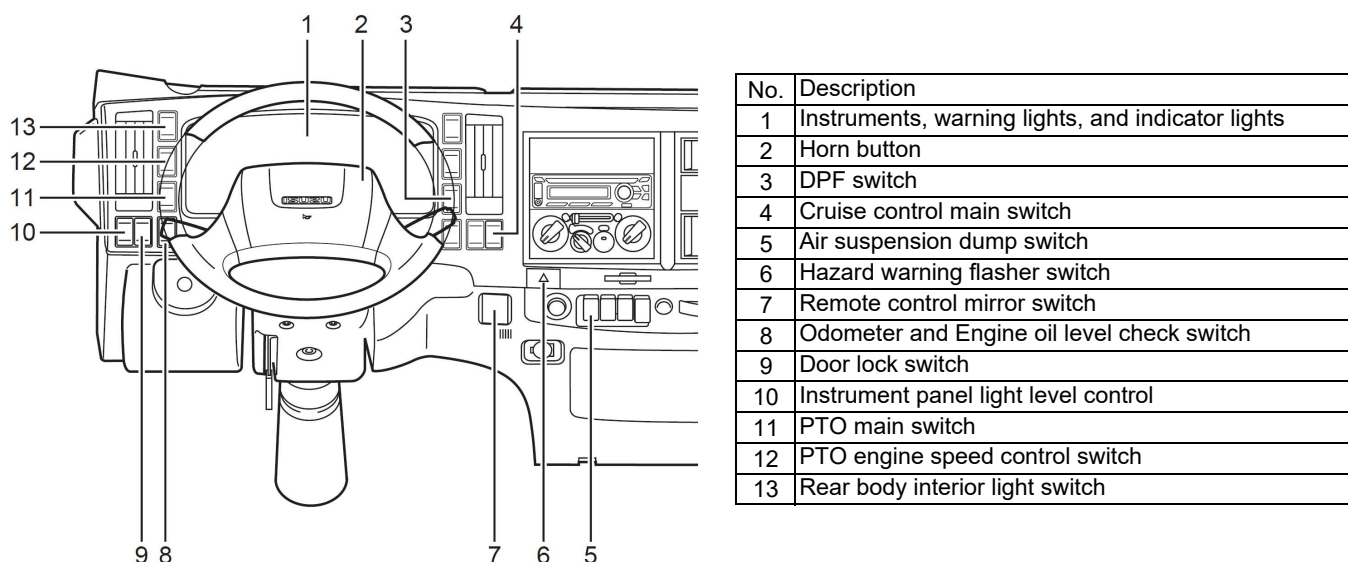
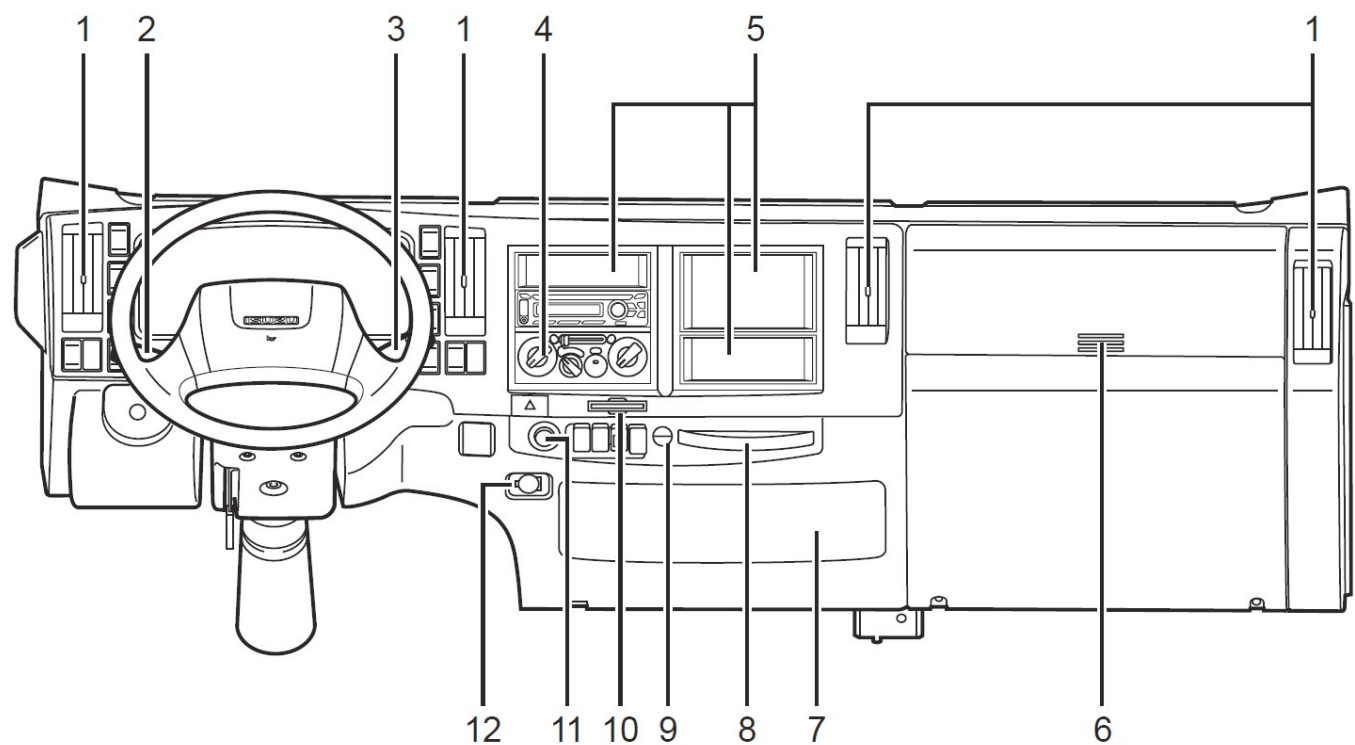
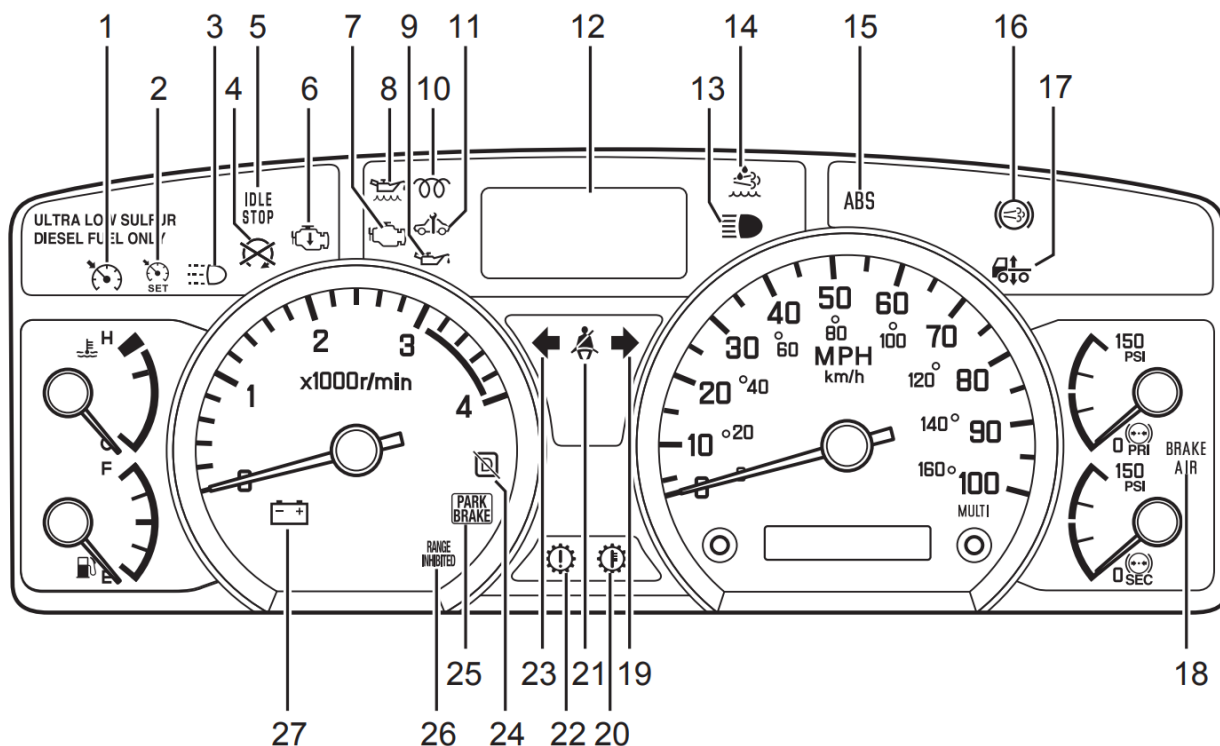


Figure 24 - F-Series Diesel Dash Panel and Driver Controls



No.	Equipment Description	No.	Equipment Description
1	Air flow direction control lever	6	Glove compartment
2	Combination light control switch	7	Relay box
	Cruise control set switch/resume switch	8	Cup holder
3	Exhaust brake switch	9	Hook
	Windshield wiper and washer switch	10	Card holder
4	Manual air conditioner	11	Accessory power outlet type 1
5	Small article storage pocket	12	Accessory power outlet type 2

Figure 25- F-Series Diesel Dash Panel



No.	Description	No.	Description
1	Cruise main indicator light	15	ABS warning light
2	Cruise set indicator light	16	Exhaust brake indicator light
3	Daytime running lights (DRL) indicator light	17	Air suspension dump warning light
4	Engine alarm (shutdown) warning light	18	Brake air pressure warning light
5	Idling stop indicator light	19	Turn signal and hazard warning indicator light (right)
6	Reduced engine power indicator light	20	Automatic transmission fluid (ATF) temperature warning light
7	Check engine malfunction indicator light	21	Seat belt warning light
8	Engine oil level indicator light	22	Check transmission warning light
9	Engine oil pressure warning light	23	Turn signal and hazard warning indicator light (left)
10	Glow plug indicator light	24	Overdrive off indicator light
11	Service vehicle soon (SVS) indicator light	25	Parking brake warning light
12	Multi-information display (MID)	26	Range inhibited warning light
13	Headlights high beam indicator light	27	Battery discharge warning light
14	Diesel exhaust fluid (DEF) indicator light		

Figure 26 - F-Series Diesel Instrument Layout

OPTION WEIGHTS		
RPO Code	Description	Front / Rear (lbs)
I6B	AGM batteries (825 CCA x 2)	14 / 5
I7V	Aluminum wheels: 4 aluminum wheels + 2 steel rear inner wheels	-56 / -56
I8V	Aluminum wheels: 6 aluminum wheels	-56 / -112
I1V	Audio system with 7" diagonal color touch screen	2 / 0
I2V	Audio system with 7" diagonal color touch screen with backup camera (camera shipped loose)	2 / 2
UZF	Back up alarm	0 / 1
I79	Block heater and oil pan heater with receptacle	3 / 0
I72	Block heater with receptacle	2 / 0
V22	Chrome grille	1 / 0
I2M	Delete cruise control switch	-3 / 0
IY4	Delete radio	-3 / 0
IH2	Engine emergency shutdown system HWT, LWL, LOP	0 / 0
IY9	Engine idle shutdown (timer set at 3 minutes for engine shutdown)	0 / 0
I9A	Engine idle shutdown (timer set at 5 minutes for engine shutdown)	0 / 0
IF6	Fire extinguisher (2.5 lbs) and triangle kit	22 / 0
I8P	Fire extinguisher (5 lbs) and triangle kit	27 / 0
I4V	Forward collision and lane departure warning (Mobileye)	2 / 0
I8L	High visibility seat belt (orange color, driver and RH passenger seat only)	0 / 0
I7L	High visibility seat belt (orange color, driver seat only)	0 / 0
I4K	Keyless entry	1 / 0
I6L	LED lighting package	0 / 0
IL9	PTO enable switch and engine idle up switch recommended for PTO and idle applications only	0 / 0
IV8	Seat covers	6 / 0
I3Z	Spare keys (2 additional, 4 keys in total)	0 / 0
I0Z	Spartan Modification Center Ship Thru Code	0 / 0
I1L	Speed limited to 58 MPH	0 / 0
I2L	Speed limited to 65 MPH	0 / 0
I3L	Speed limited to 68 MPH	0 / 0
I4L	Speed limited to 70 MPH	0 / 0
I4Q	102" wide standard mirror heads	2 / 0
I5Q	102" wide heated mirrors (flat & convex)	2 / 0
I6Q	102" wide heated remote mirrors (heated flat & convex, remote flat only)	3 / 0
I2Q	96" wide heated mirrors (flat & convex)	1 / 0
I3Q	96" wide heated remote mirrors (heated flat & convex, remote flat only)	2 / 0