Preferred Truck & Equipment
Sales and Service

Quote #: Sparks Mini 10312018
Sales Person: Michael Neubauer
Cell #: 925-519-7976
Email: michael@ptande.com

Customer: City of Sparks
Prepared for: Ron Korman
Phone: 775 353 2271
Email: rkorman@cityofsparks.us

Quantity	Description	Unit Price	Extended Price
1	Heil Mini Reloader Body, 9 cubic yard mounted on a 2018 Isuzu NRR chassis ***Factory Installed Options*** *-Full Factory Mount* *-Direct Mount Gear Pump with PTO* *-Hopper Work Light Kit - switch on tailgate* *-Strobe Light, Amber - in-cab switch* *-Single Bayne GRL 1110 tipper* ***Dealer Installed Options*** *-3rd Eye, single back up camera system with LCD*	$ 108,789.46	$ 108,789.46
1	Estimated freight	$ 6,425.00	$ 6,425.00
	This quote is per Sourcewell (NJPA) / Heil Contract 112014-THC	Sales Tax:	TBD
		FET:	exempt
		Total:	$ 115,214.46

Authorized By: _____

Date: _____

P.O. Number: _____

*This quote is good for 30 days. This quote may not include sales tax. This quote may not include Federal Excise Tax. Freight charges are subject to change. This quote is subject to terms included in package. By accepting this quote you are accepting its terms

MINI REAR LOADER

BODY HEIGHT 73”

BODY WIDTH 88”

LARGE 2.0 YARD HOPPER AVAILABLE

LIGHTWEIGHT

9,11&13 YARD UNITS

UP TO 1,000 LBS/ YD3 COMPACTION

FEATURES AND BENEFITS

Narrow, compact, lightweight, low GVW, no CDL, FET exempt

LARGE HOPPER 1

Handles the occasional commercial container with ease.

BENEFIT

More refuse, fewer tailgate cycles.

WHY IT MATTERS TO YOU

- More route productivity
- More flexibility for routes

PRECRUSHES IN HOPPER 3

The link design precompacts the refuse before it's loaded into the body.

BENEFIT

Compaction begins in the hopper, which increases payload.

WHY IT MATTERS TO YOU

- Increased route productivity
- More time on route
- More collection stops

SWING LINK DESIGN 2

Offers a smooth, efficient operation.

BENEFIT

Simple but effective swing link design means no slides, tracks or rollers, just compaction.

WHY IT MATTERS TO YOU

- Less maintenance
- Long-lasting packing mechanism

ONE-LEVER PACKER CONTROL 4

The single lever control handle allows for easy one-hand operation.

BENEFIT

Fast, easy-to-use operation, one movement in each direction cycles half the tailgate pack cycle.

WHY IT MATTERS TO YOU

- Fewer adjustments
- Less overall maintenance

AUTO-LOCK LATCHES 5

The auto-lock tailgate latches engage once the tailgate closes.

BENEFIT

Ease of operation ensures that if your tailgate is closed, it's locked, sealing up the tailgate securely.

WHY IT MATTERS TO YOU

- Worry-free operation
- Reduces leaks

BODY VALVE ON FRONT HEAD 7

The ejector and tailgate valve is located on the front head of the body.

BENEFIT

Less contamination; frees up space on frame rail.

WHY IT MATTERS TO YOU

- More chassis frame rail space
- Easier to mount

IN-BODY OIL TANK 6

Hydraulic oil tank is located in front of the body.

BENEFIT

Locating the oil tank in the body limits the exposure to contaminants and frees space on the chassis frame rail.

WHY IT MATTERS TO YOU

- Fewer chassis modifications
- Oil leaks can be contained
- Longer life for hydraulics

COMPACT SIZE 8

The Mini Rear Loader is small and maneuverable.

BENEFIT

Small body allows access to those exclusive high-service price areas that you couldn't get into before.

WHY IT MATTERS TO YOU

- Great for alleys and gated communities

Body Specifications		9 yd^3	11 yd^3	13 yd^3
Hopper Capacity	yd^3	2.0	2.0	2.0
	m^3	1.5	1.5	1.5
Overall Length	in.	199	223	247
	mm	5055	5664	5274
Overall Width	in.	88	88	88
	mm	2235	2235	2235
Overall Height Above Frame	in.	73	73	73
	mm	1854	1854	1854
Gross Weight (approximate)	lbs.	7600	7900	8200
	kg.	3447	3584	3720
Cycle Time	18 seconds			
Compaction Ratio	Up to 1,000 lbs per yd3			

Precision, Quality...and Patented Engineering!

GRL Series Mobile Cart Lifter

The Grabber products are the most versatile series of lifters from Bayne. These products were specifically designed for the hauler who must pickup a variety of different residential roll-out carts on the same route. The GRL clamp arm design is the first one in the industry that does not require the removal of the clamp arms to dump commercial containers. The GRL series is ideally suited for rear-load applications by offering an ample amount of ground clearance, reducing the risk of damaging the lifter on uneven terrain such as alley entrances and landfills.

Features

- Powered by the exclusive Thinline® rack and pinion rotary actuator for smooth operation
- Compatible with both semi-automated and fully automated roll-out carts
- Clamp arms do not have to be removed to dumpp commercial containers
- Measures only 71/8 inches thick in the fully clamped position
- 19 inches of ground clearance reduces the risk of damaging the lifter on uneven terrain
- Dumps cart higher and deeper inside the hopper opening to prevent spillage and increase route stops before cycling packer blade
- Self-lubricating composite bearings at main pivot points
- Powder-coated finish for durability
- 2-Year Limited Warranty

Product Specifications	
Cart Compatibility	ANSI Z 245.60-2008 Type B Carts (domestic style 2-bar) ANSI Z 245.60-1996 Type C Carts (European style) ANSI Z 245.60-1996 Type D Carts (pocketed style) ANSI Z 245.60-1996 Type G Carts (automated style) Standard size 30 and 55 gallon drums
Lift Capacity	400 lbs @ 1800 psi
Hydraulic Pressure	Working Pressure – 1,800 psi / Maximum Pressure – 2500 psi
Hydraulic Flow	2.0 – 2.5 gpm
Cycle Time	10-12 sec
Bearings	Self-Lubricating Composite Material
Actuator	Exclusive Thinline® Rack and Pinion Rotary Actuator
Finish	Safety Yellow Powder Coating
Options	• Tap-In Kit • Mounting Plate Kit for Bolt-On Application • Commerical Container Bumper Kit

BAYNE Thinline
Lifting Ergonomics To New Heights
Premium Lift Systems

For information or to order, call toll-free 800-535-2671 or visit us at www.baynethinline.com.

MODEL	NRR Diesel
GVWR	19,500 lb.
WB	109 in, 132.5 in, 150 in, 176 in, 200*in., 212*in.
ENGINE	Isuzu 4-cylinder, in-line 4-cycle, turbocharged, intercooled, direct injection diesel.
Model/Displacement	4HK1-TC/317 CID (5.19 liters)
HP (Gross)	215 HP/2500 RPM
Torque (Gross)	452 lb. ft. torque/1850 RPM
Equipment	Dry element air cleaner with vertical intake; 2 rows 564 square in^2. radiator; 7 blade 20.1in diameter fan with viscous drive. Cold weather starting device and an oil cooler. Engine oil level. Engine warning system with audible warning for low oil pressure, high coolant temperature, and low coolant level. Engine cruise control function. Rear engine cover.
TRANSMISSION	Aisin A465 6 speed automatic transmission with fifth and sixth gear overdrive with lock up in 2nd, 3rd, 4th, 5th and 6th, PTO capability automatic torque converter lockup in stationary PTO mode.
STEERING	Integral power steering 18.8-20.9:1 ratio. Tilt and telescoping steering column.
FRONT AXLE	Reverse Elliot “I” -Beam rated at 7,275 lb..
Suspension	Semi-elliptical steel alloy tapered leaf springs with stabilizer bar and shock absorbers.
GAWR	7,275 lb.
REAR AXLE	Full floating single speed with hypoid gearing rated at 14,550 lb..
Suspension	Semi-elliptical steel alloy multi-leaf springs and shock absorbers.
GAWR	13,660 lb.
WHEELS	19.5x6.0-K 6 hole disc wheels, painted white.
TIRES	225/70R-19.5E (12 pr) LRR (Low Rolling Resistance) tubeless steel belted radials, all season, front and rear.
BRAKES	Dual circuit power assisted hydraulic service brakes with EBD (Electronic Brake Distribution) system for load proportioning of the brake system front disc and self-adjust outboard mounted drum rear. The parking brake is a mechanical, cable actuated, internal expanding drum type, transmission mounted. The exhaust brake is standard and is vacuum operated. 4 channel anti-lock brake system.
FUEL TANK	30 gal. rectangular steel fuel tank mounted in frame rail behind rear axle. Fuel water separator with indicator light.
FRAME	Ladder type channel section straight frame rail 33.5 in wide through the total length of the frame. Yield strength 44,000 psi, section modulus 7.20 in^3. RBM 316,800.
CAB	All steel low cab forward, BBC 70.9 in, 45o mechanical tilt with torsion assist.
Equipment	TRICOT breathable cloth covered high back driver’s seat with two occupant passenger seat. Dual cab mounted exterior mirrors with integral convex mirror. Tilt and telescoping steering column. Power windows and door locks, floor mats, tinted glass, AM/FM CD stereo radio.
ELECTRICAL	Two 12 volt Group 31 750 CCA maintenance-free type batteries with threaded posts, 140 Amp alternator with integral regulator.
OPTIONS	See last page for options.
	Note: These selected specifications are subject to change without notice

VEHICLE WEIGHTS, DIMENSIONS AND RATINGS

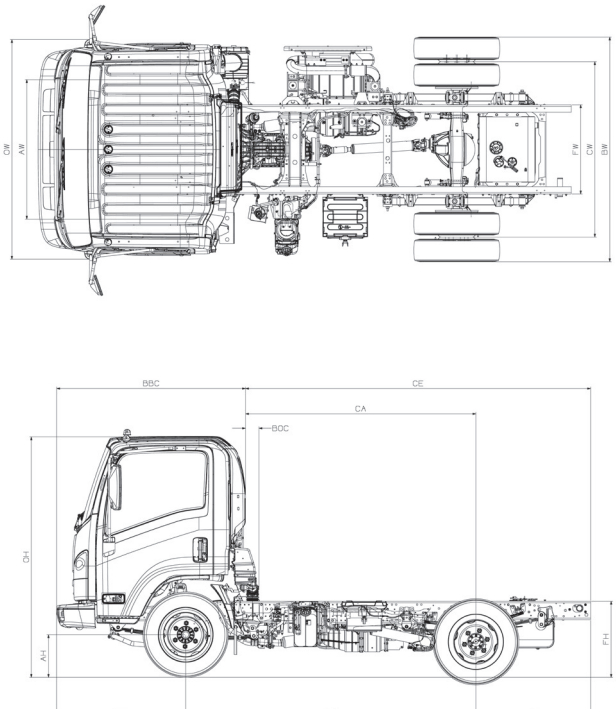


Figure 24.1 N-Series Diesel Cab Chassis Dimensions

Dimension Constants:

Code	Inches	Code	Inches
AH	7.5	BW	83.3
AW	65.6	CW	65
BA	48.3	FW	33.5
BBC	70.7	OH	92.4
BOC	7.7	OW	81.3
FH	33.0		

Variable Chassis Dimensions:

Unit	WB	CA*	CE*	OAL	AF
Inch	109.0	86.5	129.6	200.5	43.1
Inch	132.5	110.0	153.1	224.0	43.1
Inch	150.0	127.5	170.6	241.5	43.1
Inch	176.0	153.5	196.6	267.5	43.1
Inch	200.0	177.5	220.6	291.5	43.1
Inch	212.0	189.5	232.6	303.5	43.1

* Effective CA & CE are CA or CE less BOC.

In-Frame Tank

Model	WB	Unit	Front	Rear	Total	Payload
NU1	109.0 in	lb.	4145	2480	6625	12875
NU2	132.5 in	lb.	4237	2484	6721	12779
NU3	150.0 in	lb.	4299	2466	6765	12735
NU4	176.0 in	lb.	4361	2463	6824	12676
NU5	200.0 in	lb.	4524	2662	7186	12314
NU6	212.0 in	lb.	4534	2672	7206	12294

Side Mounted Tank

Model	WB	Unit	Front	Rear	Total	Payload
NU4	176.0 in	lb.	4496	2340	6836	12664

Vertical Exhaust Option Dimensions:

Variable Chassis Dimensions:

Unit	WB	EFF CA*	EFF CE*	OAL	AF
Inch	109.0	62.5	105.6	200.5	43.1
Inch	132.5	86.0	153.1	224.0	43.1
Inch	150.0	103.5	146.6	241.5	43.1
Inch	176.0	129.5	172.6	267.5	43.1

* Effective CA & CE listed are standard CA or CE less vertical exhaust BOC of 24 inches.
Vertical Exhaust BOC = 24 inches

Technical Notes:
Chassis Curb Weight reflects standard equipment and fuel, but no driver or payload.

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

Vehicle Weight Limits:

GVWR	
Designed maximum	**19,500 lb.**
GAWR, Front	**7,275 lb.**
GAWR, Rear	**13,660 lb.**

MODEL DESCRIPTIONS

The N-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 46.5 degrees inside wheel cut angle coupled with integral power steering make it an extremely maneuverable truck.

ENGINE

The N-Series Diesel is powered by the 4HK1-TC engine with a displacement of 317 cubic inches (5.19 liters). This engine is designed for enhanced durability, reliability and clean/efficient combustion. This engine is turbo-charged and inter cooled. The air-to-air intercooler provides increased horsepower and torque while maintaining good levels of fuel economy. The 4HK1-TC features a 16 valve, 4-cylinder, in-line overhead camshaft timing train, ladder frame structure and an electronic common rail injection system.

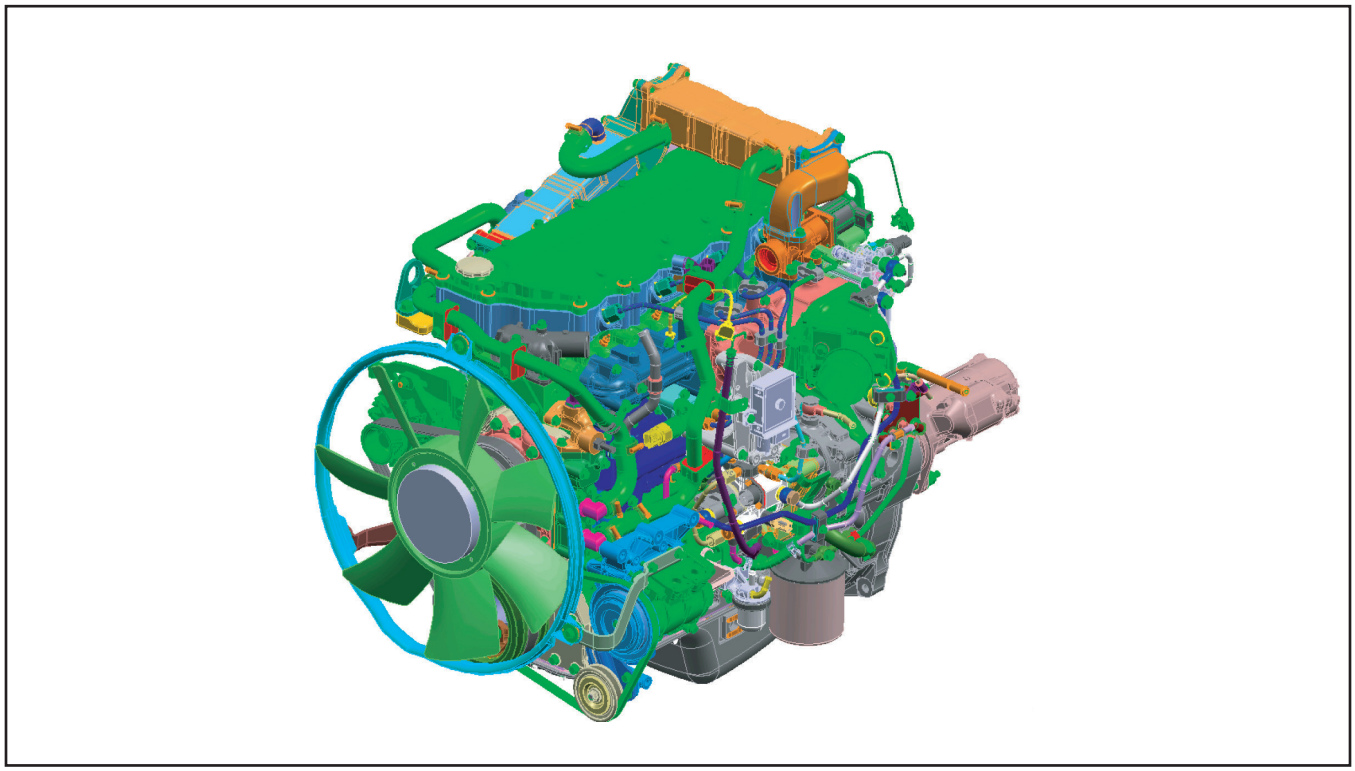


Figure 24.2 N-Series Diesel 4HK1-TC

Engine Data: 4HK1-TC w/50 State
Heavy Duty Certification

Power (gross)*	215 HP @ 2,500 rpm
Torque (gross)*	452 lb.-ft. @ 1,850 rpm
	Governed RPM 2750 rpm
Injection	Denso common rail direct injection
Displacement	317 CID / 5.2L
Cylinder Bore	4.53 in (115 mm)
Cylinder Stroke	4.92 in (125 mm)
Cylinders	4-cylinder, in-rail OHC
Operating Cycles	4-cycle, turbocharged and inter cooled

*SAE J1349 gross ratings without fan operating.

4HK1-TC ENGINE PERFORMANCE CURVES (SAE GROSS)

US10 4HK1 Engine Curve - Automatic

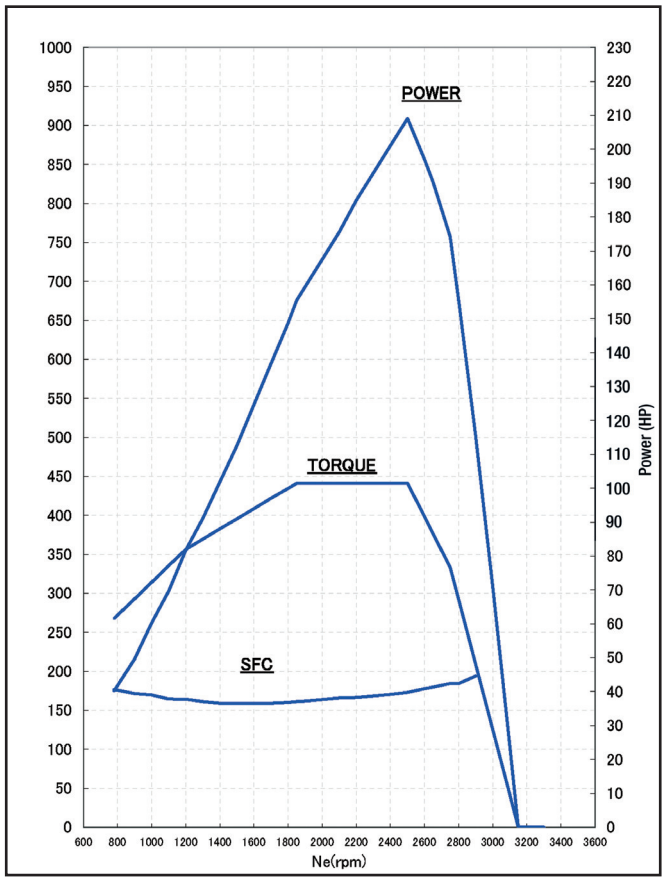


Figure 24.3 N-Series Diesel 4HK1-TC

Engine Feature
Starting with the 2011 model year, the 4HK1-TC engine received a host of internal and external changes to improve performance and reliability, reduce emissions, and increase fuel economy. The current 4HK1-TC engine will have approximately 8% better fuel economy than the 2010 model year engine. The new high pressure common rail injection system design has been combined with the new water cooled EGR system to achieve levels of performance previously not attainable. The 4HK1-TC is turbocharged and intercooled with a 50-state emission certification. The Turbocharger is an IHI Variable Geometry Turbocharger (VGT) that provides excellent boost response over the entire RPM range of the engine. The turbocharger compressor wheel is upgraded to a new, higher efficiency wheel which improves fuel consumption and emissions. The turbocharger housing structure is strengthened mechanically to also improve reliability. Each and every engine is test run prior to installation to assure rated performance and quality.

Cylinder Block
The cylinder body is made of cast iron and is a parent bore design with five bearings. The cylinder walls are induction hardened for enhanced durability and long life. The bearing cap has a ladder frame struc-ture integrating with the crankcase to increase block rigidity for greater strength against mechanical loads and stresses. The cylinder block water passages are designed to improve coolant circulation and eliminate hot spots. Additionally, the block is strengthened and stiffened in several key areas to reduce stress and increase engine life.

CYLINDER HEAD
The cylinder head features 4 valves per cylinder and a direct injection fuel system. The cylinder head is made from a high strength cast iron material and is held in place by 20 high strength head bolts. Starting with the 2011 model year, the cylinder head casting is entirely new, with new water passages to improve coolant circulation and eliminate hot spots. Additional stiffening ribs have been added to the casting to increase head stiffness in order to improve head gasket retention and improve engine reliability. The intake and exhaust port geometry is entirely new and designed to improve air flow and combustion efficiency. The cylinder head bolt engagement length has been increased to improve clamping force and engine stiffness, which increases reliability while reducing transmitted combustion noise.

Overhead Camshaft
The camshaft is directly above the cylinder this minimizes valve train losses by eliminating the push rods and other components. The camshaft followers are is a roller type for reduced friction losses. Valve timing events have been modified via revised camshaft lobe profiles for improved engine performance.

Crankshaft
The crankshaft is made from forged steel. It has 5 main bearings and is fully counterweighted. In the 2011 model year, the crankshaft main bearing journal diameters were increased for reduced wear and improved reliability. The crankshaft is retained by 27 bolts connecting the lower ladder-structure crankcase to the engine block. Starting in the 2011 model year, the crank case bolt thread engagement to the block was increased in order to increase clamping force and further stiffen the block for improved reliability and reduced combustion noise.

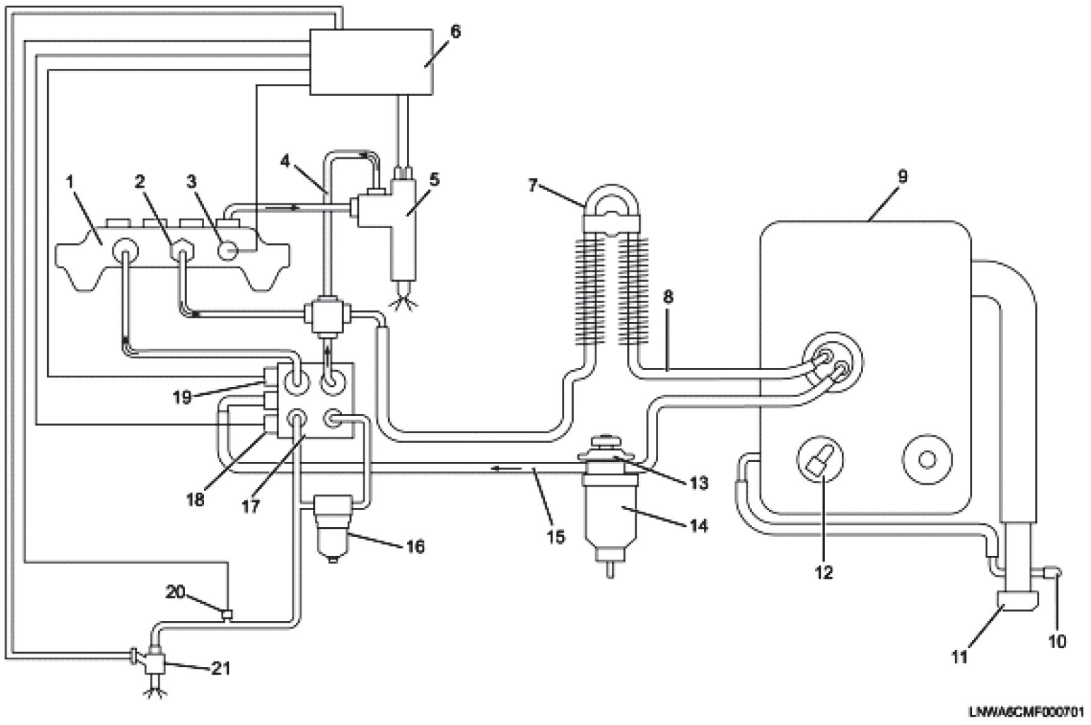
Pistons
The aluminum alloy pistons are cam ground. This process allows them to assume a round shape when warm so they will precisely match the shape of the cylinder. This means that the piston ring assembly seals better, and results in longer engine life. The top ring carrier is cast into the top ring groove, and four sides of the top ring are nitrided and the outside is coated with hard metal to ensure sufficient strength and wear resistance between the ring and groove. The piston has changed to a higher strength aluminum alloy than was used on the 2008 to 2010 N-series diesels. Additionally, the wrist pin diameter has been increased from 40 to 50 mm to improve strength under high combustion pressures, and the combustion chamber has been redesigned in order to achieve reduced emissions and improved fuel consumption.

Valves
Two intake and two exhaust valves are forged from heat resistant steel. The valve tappets are roller type for reduced friction and better performance.

Cold Start
As an aid for cold weather starting, the 4HK1-TC is equipped with glow plugs located in the cylinder head. 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 has been increased to provide increased oiling for reduced wear and improved reliability. The 4HK1-TC engine also features a plate type oil cooler in the water jacket to help control oil temperature. The Closed Crankcase Ventilation (CCV) System has been redesigned to dramatically reduce oil carryover. This will improve emissions performance and engine reliability, and reduce oil in the intake system. The oil cooler capacity has been increased to improve cooling performance. 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. Oil change intervals are 10,000 miles. Oil Capacity 11.0 L (11.6 Q) with filter change.

FUEL SYSTEM



(1) Fuel Rail
(2) Pressure Limiter
(3) Fuel Rail Pressure (FRP) Sensor
(4) Leak Off Pipe
(5) Fuel Injector
(6) Engine Control Module (ECM)
(7) Fuel Cooler
(8) Fuel Return Pipe
(9) Fuel Tank
(10) Vent Valve
(11) Fuel Filler Cap
(12) Fuel Level Sensor
(13) Priming Pump
(14) Sedimenter
(15) Fuel Feed Pipe
(16) Fuel Filter
(17) Fuel Supply Pump
(18) Fuel Rail Pressure (FRP) Regulator
(19) Fuel Temperature (FT) Sensor
(20) Diesel Particulate Filter (DPF) Fuel Pressure Sensor
(21) Diesel Particulate Filter (DPF) Fuel Injector

Figure 24.4 N-Series Diesel Fuel Circuit

Biodiesel Blends:

Isuzu recognizes the importance of using Biodiesel Fuels as an alternative and renewable fuel based on global trends and requirements such as energy security and reducing contributions to global warming. Based on current circumstances, Isuzu supports the utilization of B20 (20% Fatty Acid Methyl Ester (FAME) Blended Diesel Fuel) in our diesel trucks with some requirements/restrictions, since B20 has unique properties and is different from conventional (distilled) diesel fuels.

Biodiesel blends containing more than 5% and up to 20% biodiesel must meet the latest version of ASTM Specification D7467 (biodiesel blends B6 - B20). Also, the FAME (B100) to be blended with conventional diesel fuel must meet the latest version of ASTM D6751, regardless of concentration. We recommend that biodiesel users purchase biodiesel blends from a BQ-9000 certified vendor.

Fuel System
The fuel system is standard with a 30-gallon rectangular steel fuel tank mounted in frame behind the rear axle. 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 with see-through bowl and a hand fuel primer pump should priming the engine be required.

Injection System
The fuel injection system is a Denso common rail type fuel system. Pressure is supplied by a high pressure pump to the common rail. Fuel is then distributed to the injectors which are controlled by the engine Electronic Control Module (ECM). The injectors deliver the correct amount of fuel regardless of speed and altitude. The injection pressure has been increased from 160 MPa (23,200 psi) to 200 MPa (29,000 psi) to reduce emissions and improve fuel consumption. Combustion noise has also been significantly reduced. Use only Ultra Low Sulfur diesel fuel grade 2-D (S15); Use only Ultra Low Sulfur diesel fuel grade 1-D (S15) Ultra low sulfur fuel in cold weather conditions. Due to the fact that the 1-D (S15) has a lower heat value, performance and fuel economy will be slightly affected.

Cooling System
The water pump is a belt driven centrifugal unit. The cooling system has a capacity of 5.2 gallons. The radiator has an integrated transmission oil cooler. The radiator is a two row tube and corrugated fin type with a frontal area of 564 in2. The fan is 7-blade type, 20.1 inch (510 mm) diameter, with a viscous drive hub to reduce noise and increase engine fuel economy. An optional 600 watt engine block heater and an optional 300 watt oil pan heater can be ordered for cold climates.

Exhaust Gas Recirculation (EGR) System
In order to reduce emissions of harmful Oxides of Nitrogen (NOx), all N-Diesel vehicles utilize cooled EGR. The EGR system on the 4HK1-TC engine features several improvements. New EGR coolers provide increased cooling capacity for improved emissions performance. The secondary EGR cooler is mounted across the top of the valve cover and now features two ports that allow air to be bled from the system and coolant to be added to the cooling system. This change will significantly improve serviceability and reduce the time required to bleed the cooling system. Additionally, the EGR valve motor has been upgraded to brushless motor design, which will increase service life of the motor and valve.

Air Cleaner System
Donaldson air cleaner canister with 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 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.

Engine Warning System
The 4HK-1TC 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 be also 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.

Clean Idle
The Isuzu NPR-HD/NQR/NRR diesel will have the “Clean Idle” label. This label indicates that the manufacture has certified the engine to a lower NOx standard and therefore is not required to have an engine idle shutdown on the vehicle.

Optional
Programable Engine Idle Shutdown
The engine idle time can be limited through this optional feature. The idle shutdown will save fuel and reduce idle time wear on the engine.

The timer options available are:
IY9 Engine Idle Shutdown
(Timer set at 3 minutes for engine shutdown)

IA9 Engine Idle Shutdown
(Timer set at 5 minutes for engine shutdown).

PROPELLER SHAFT

The propeller shaft assembly is made up of a first and second shaft. The propeller shaft center support bearing is an oil seal type dust seal, and is attached to the rear of the first shaft and mounted to the crossmember by a rubber cushion and steel support bracket. The sliding spline, located on the front portion of the second shaft, is an involute spline type. Attachment of the propeller shaft assembly is by flanged couplings with four bolts each.

Wheelbase	109	132.5	150	176	200	212
No. of Shafts	1	2	2	2	2	2
Shaft #1 O.D.	3.54	3.54	3.54	3.54	3.54	3.54
Thickness	0.126	0.126	0.126	0.126	0.126	0.126
Length	37.00	22.91	40.24	49.69	49.69	49.69
Type	A	B	B	B	B	B
Shaft #2 O.D.	N/A	3.54	3.54	3.54	3.54	3.54
Thickness	N/A	0.126	0.126	0.126	0.126	0.126
Length	N/A	36.13	36.50	52.90	24.00	36.00
Type	N/A	C	C	C	B	B
Shaft #3 O.D.	N/A	N/A	N/A	N/A	3.54	3.54
Thickness	N/A	N/A	N/A	N/A	0.126	0.126
Length	N/A	N/A	N/A	N/A	52.90	52.90
Type	N/A	N/A	N/A	N/A	C	C

Figure 24.5

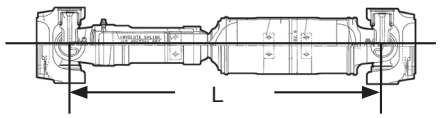
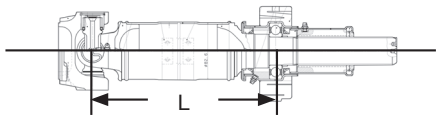
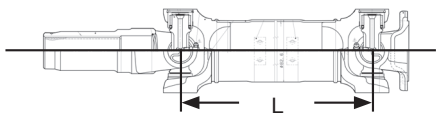
Type	Description	Illustration
Type **A**	1st shaft in 1-piece driveline	
Type **B**	1st shaft in 2-piece driveline	
Type **C**	2nd shaft in 2-piece driveline	

Figure 24.6

Note: Dimensions in inches

AISIN AUTOMATIC HD TRANSMISSION

The Aisin A465 Automatic is the standard transmission in the NRR Diesel. The key drivetrain components in the N-Series Diesel (engine, transmission and rear axle) are all engineered and matched to operate as a team to provide optimal performance and economy.

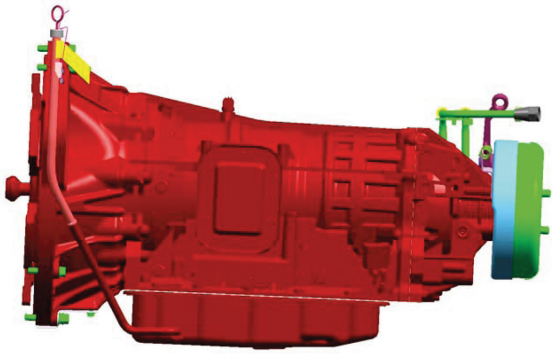


Figure 24.7 N-Series Diesel Aisin Transmission

Aisin Automatic Transmission	
Model:	**A465**
Gear and Ratios	
1st	3.742:1
2nd	2.003:1
3rd	1.343:1
4th	1.000:1
5th	0.773:1
6th	0.634:1
Rev.	3.539:1
A/T Fluid	13.1 liters
Weight/Wet	362 lbs.. (164 kg)

Features:

- 6-speed double overdrive with lock-up converter in 2nd, 3rd ,4th, 5th and 6th gear, acceleration and deceleration.
- Shift control-electronic through microprocessor.
- PTO Capacity: Maximum 134 lb.-ft. torque at 1700 RPM.
- Torque converter multiplication ratio of 1.7639:1.
- See exhaust system features for additional special pto/regeneration options PTO options

Other Specifications	
PTO	Automatic torque converter lockup in stationary PTO mode
Bolt Pattern:	SAE 6 bolt PTO opening
PTO Rating	Maximum 134 lb.-ft. torque at 1,700 RPM

FRONT AXLE

The N-Series Diesel front axle is a drop forged steel, reverse Elliot, “I”-Beam with special heat treating for addition capacity.

Front Axle Specifications:

Type	Steel Drop Forged Reverse Elliot, “I”-Beam
Rated Capacity	7,275 lbs.
Tread Width	66.1 in
King Pin Type	Bronze Bushings
Thrust Bearing	Ball Type (RH) Roller (LH)
Hub Lubrication	Grease

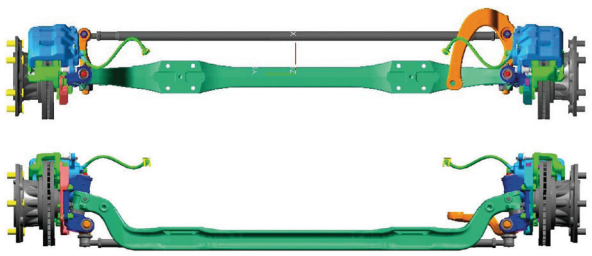


Figure 24.8 N-Series Diesel Front Axle

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 Springs
Capacity	8,440 lbs.
Effective Length	51.2 in
Width	2.8 in
Deflection Rate	1028 lbs./in. (180 N/mm)
No. Leaves	3
Leaf Thickness	3 @ 0.71 inch
Stabilizer Bar Diameter	1.65 in
Thickness	0.16 in

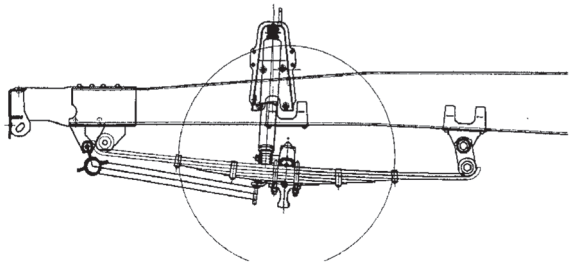


Figure 24.9 N-Series Diesel Front Suspension

STEERING SYSTEM

The NRR-Series Diesel is equipped with Higher capacity integral power steering gear with a 18.8-20.9:1 gear ratio and a variable ratio pump with additional capacity for the increased front axle capacity of the NRR. This provides power assist when turning while providing good road feel and feedback driving straight ahead. The system also features a tilt and telescopic steering column that allows adjustment of the steering wheel location for driver comfort and convenience.

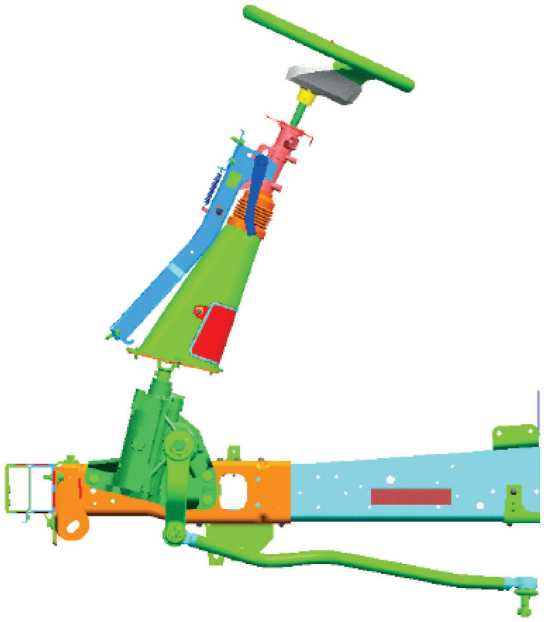


Figure 24.10 N-Series Diesel Steering Column

TURNING DIAMETERS

The N-Series Diesel steering also features a 46.5 degrees inside wheel cut angle. This, coupled with the integral power steering, makes the N-Series Diesel an extremely maneuverable truck.

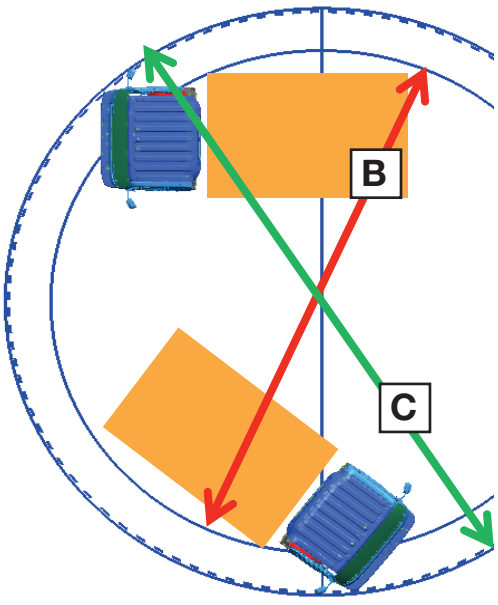


Figure 24.11 N-Series Diesel Turning Circle Diagram

B=Minimum turning diameter curb to curb

C=Minimum turning diameter wall to wall

Turning Diameters (design value)

WB	B curb to curb	C (ft. wall to wall (ft.)
109.0	32.8	38.7
132.0	40.0	44.9
150.0	45.3	50.2
176.0	52.5	58.1
200.0	61.0	67.2
212.0	66.0	73.0

REAR AXLE

The N-Series Diesel 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.

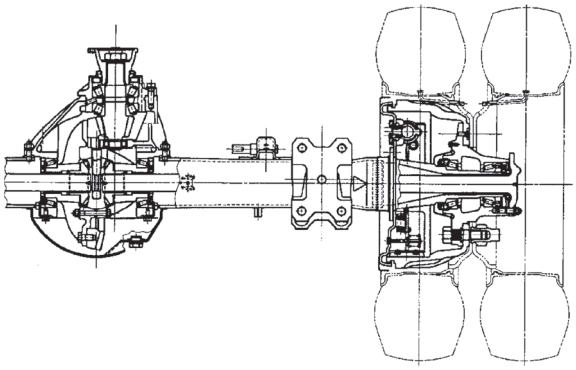


Figure 24.12 N-Series Diesel Rear Axle

Rear Axle Specifications:

Model	R066
Type	Full Floating Banjo
Rated Capacity	14,550 lbs.
Tread Width	65.8 in
Gear Type	Hypoid
Ring Gear Diameter	12.6 in
Differential type	4 Pinion Gear
Ratio	5.571
Hub Lubrication	Oil
Oil Type	See owner’s manuel
Oil Capacity	See owner’s manuel

Limited Slip Differential (LSD)

A limited slip differential is available from the factory. This LSD will help provide additional traction under conditions where road surface traction has been decreased

REAR SUSPENSION

The rear suspension consists of a multi leaf spring with shock absorbers designed to handle the loads. The long effective spring length design provides excellent ride characteristics.

Rear Suspension Specifications:

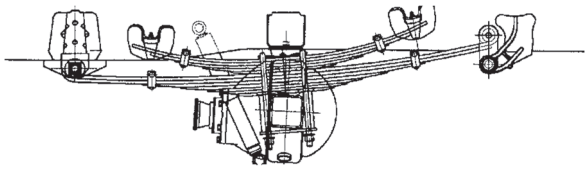


Figure 24.13 N-Series Diesel Rear Suspension

Type	Multi Leaf Spring
Capacity	14,550 lbs.
Main Springs	
No. Leaves	5
Effective Length	51.2 in
Width	2.8 in
Leaf Thickness	4 @ 0.47 in
	1 @ 0.43 in
Deflection Rate	1119 lbs. /in. (196 n/mm)
Auxiliary Springs	
No. Leaves	3
Effective Length	33.5 in
Width	2.8 in
Leaf Thickness	0.61 in
Deflection Rate	4,363 lb./in. (608 N/mm)
Main + Auxiliary	
Deflection Rate	5,482 lb./in. (764 N/mm)

FRAME

The frame in the N-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. New 80/40 mm modular hole spacing is standard and assists in making body mounting easier and faster for equipment suppliers. The chassis is equipped with a steel reinforced composite front bumper for greater cab protection and improved styling.

FRAME SPECIFICATIONS

	Cab Chassis					
WB	109	132.5	150	176	200	212
Side Rail Sec.	8.50 in X 2.76 in X 0.24 in					
Combined Section Modulus	7.20 in^3					
Yield Strength	44,000 psi					
Rated RBM (per Rail)	316,800 lb.-ft./in.					
No. Crossmembers	5	6	6	6	7	7
Frame width	33.5 in (850 mm)					

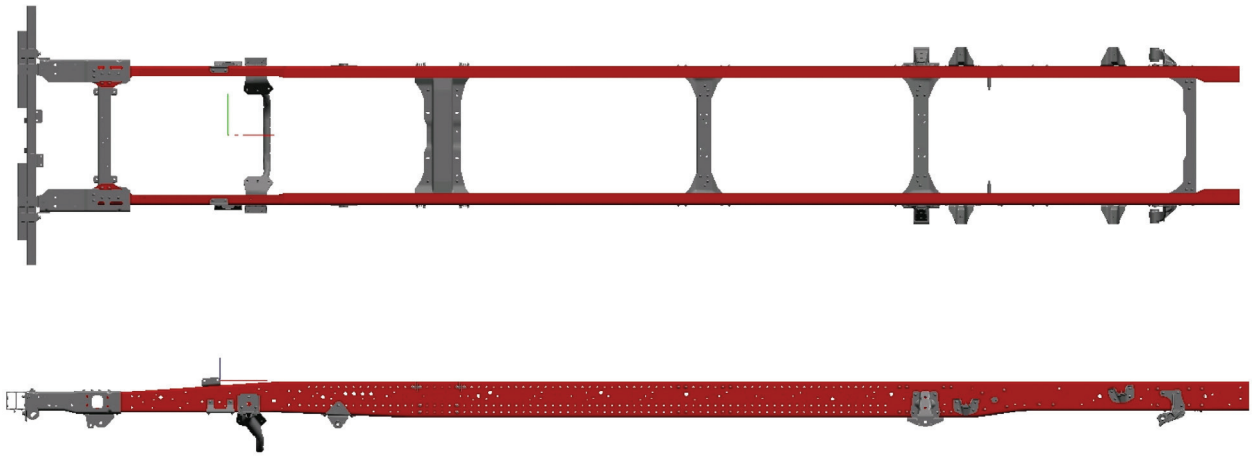


Figure 24.14 N-Series Diesel Frame

FUEL TANK

The standard location is an in frame 30 gallon fuel tank with a green cap.

The fuel tank is mounted in the rail behind the rear axle, within the suspension area. This location enhances vehicle safety while providing easier installation of vocational bodies. The steel fuel tank is rectangular in shape. It is equipped with a fill hose that goes through the rail allowing for the lowest possible mounting height for a body.

FUEL TANK OPTIONS

RH tank in place of Standard tank.
An optional 33 gallon cylindrical fuel tank is available in place of the rectangular in frame tank. It is mounted on the outside of the right hand frame rail.
(this tank is only available on the 176 inch wheelbase chassis).

Dual Tank

An optional 33 gallon cylindrical fuel tank is available in addition to the standard rectangular in frame tank. It is mounted on the outside of the left hand frame
(this tank is only available on the 150 and 176 inch wheelbase chassis).

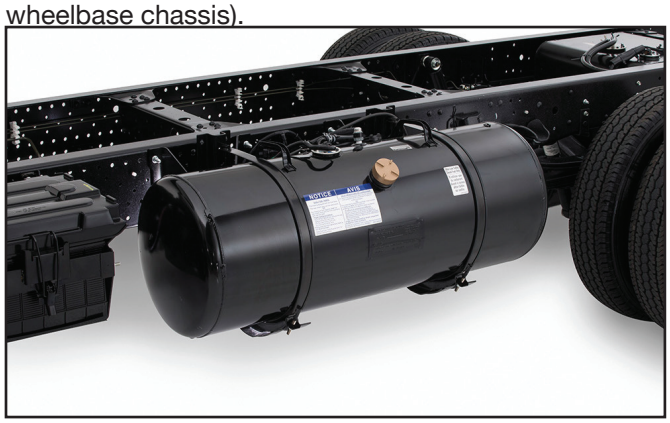


Figure 24.15 N-Series additional tank Diesel Frame

BRAKE SYSTEM

The service brake system is a dual circuit assisted hydraulic system. The NRR DIESEL is standard with front disk brakes and self-adjusting out board mounted rear brake drums. The system incorporates an Anti-lock Braking System (ABS) and Electronic Braking force Distribution. The ABS is designed to avoid the locking of the wheels 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 the ease of serviceability of the system. The system offers excellent stopping power, long service life, and non asbestos brake linings. The Electronic Braking force Distribution (EBD) suppresses an excessive rise in rear brake pressure based on wheel speeds and brake pressure sensors. EBD provides the best balance for a given load to provide maximum brake lining life based on wheel speeds and brake pressure sensors this in turn extends maintenance intervals and lowers operating costs.

ABS/EBD BRAKE SYSTEM OPERATION

The ABS control unit increases, decreases, or keeps brake fluid 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 that a predetermined value the control unit senses that the wheel is about to lock up and the unit keeps the fluid pressure as it is. If the wheel further decelerates the control unit senses that the wheel is locking up and reduces the brake fluid pressure. When the control unit senses that the wheel is unlocked, the unit maintains or increases brake fluid pressure repeatedly.

Power Assist:

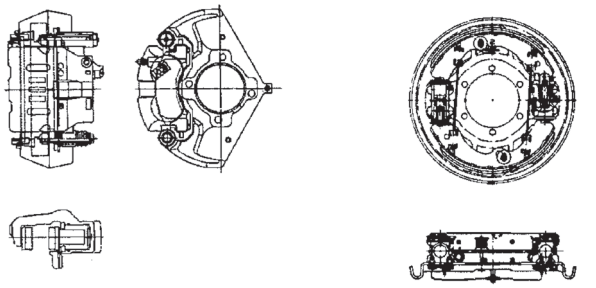
The power assist for the system is supplied via a pump that is driven off of the rear gear drive of the engine.

OVERRIDING ACCELERATOR WITH BRAKES

ECM logic has been adopted that will reduce engine RPM to engine idle RPM when the brake and accelerator pedals are applied simultaneously above 5 mph in a forward gear position. This ECM logic has been adopted to enhance the safe operation of the vehicle.

BRAKE SPECIFICATIONS

Type	**Hydro Boost Hydraulic, Dual Circuit**
Front Disc:	
Overall Diameter	14.3 in
Effect Diameter	11.7 in
Swept Area	203.8 in
Rear Drum:	
Diameter	14.6 in
Width	5.91 in
Thickness	0.49 in
Lining Area	178.7 in
Lining Material	Non-asbestos/Semi-Metallic



Disc Brake **Drum W/Auto Adjust**

Figure 24.16 N-Series Diesel Brakes

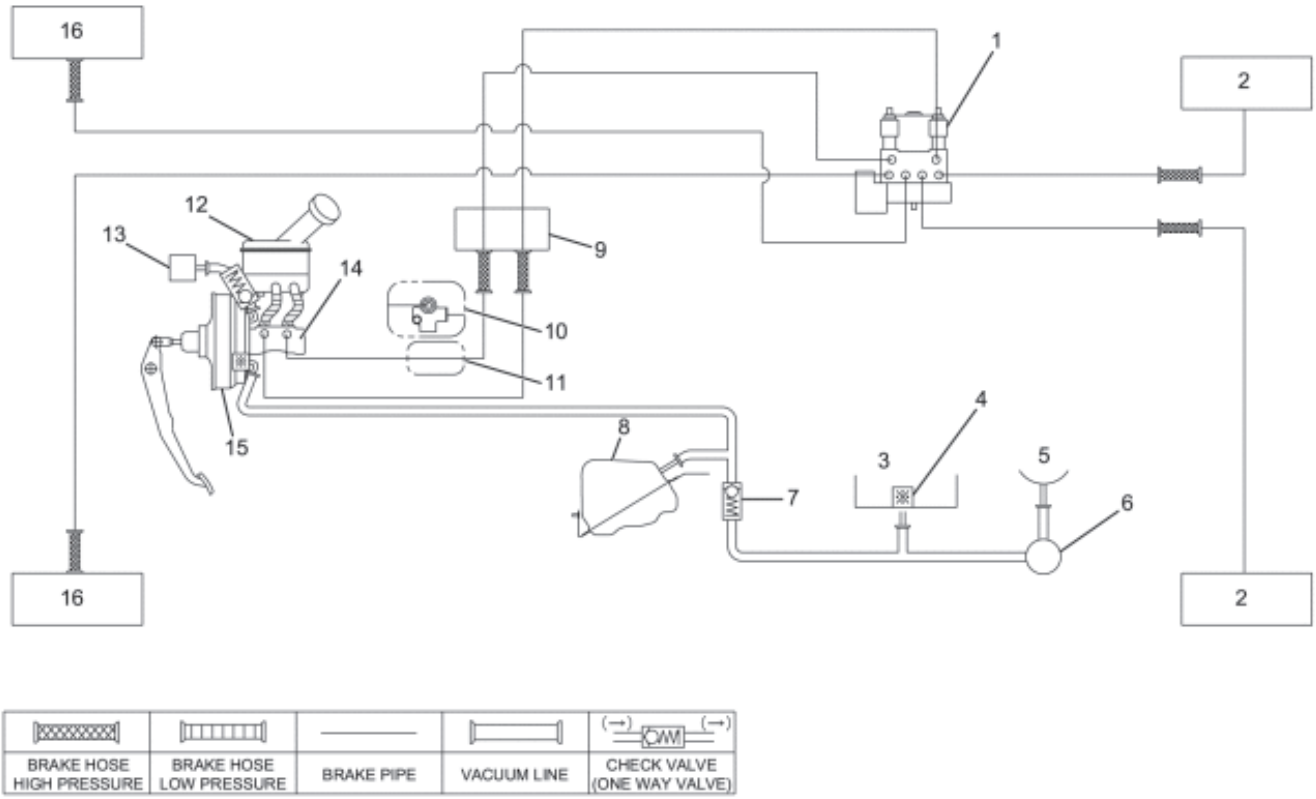


Figure 24.17

NRR DIESEL 19,500 GVW

(1) Electronic Hydraulic Control Unit (EHCU)
(2) Rear Wheel Cylinder
(3) Vacuum Pump
(4) Check Valve
(5) Exhaust Brake Valve
(6) Magnetic Valve
(7) Check Valve (One-way Valve)
(8) Vacuum Tank
(9) 4-Way Connector
(10) With Metering Valve
(11) W/O Metering Valve
(12) Brake Fluid Reservoir
(13) Electric Vacuum Pump
(14) Master Cylinder
(15) Vacuum Booster (Servo Unit)
(16) Front Wheel Cylinder

Figure 24.18 N-Series Diesel Exhaust

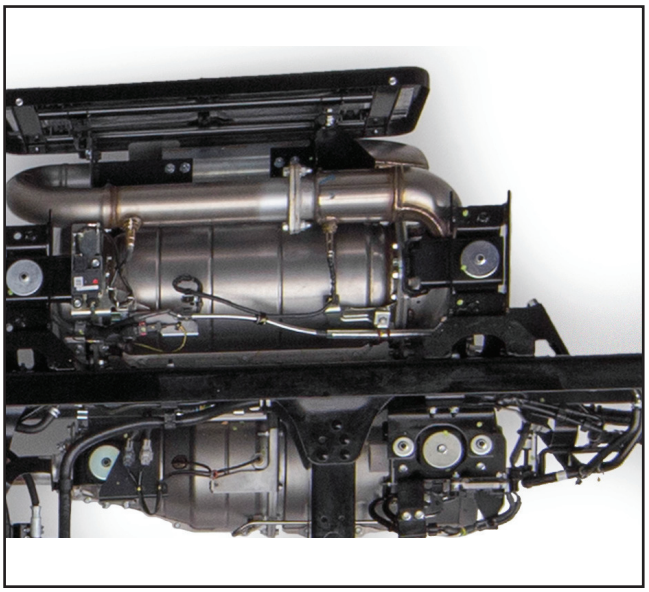


Figure 24.19 N-Series Diesel Exhaust

Exhaust Aftertreatment System
The stainless steel engine exhaust system routes to a horizontally mounted Diesel Particulate Filter (DPF) and Selective Catalytic Reduction System (SCR) unit. This combination unit along with an enhanced EGR system and variable vane turbocharger allow the series chassis to meet the 2010 EPA emission standards. The new exhaust system monitors the particulate status of the DPF and levels of the Diesel Exhaust Fluid (DEF) needed for the SCR system to operate. These functions are reported to the driver via the Multi Information Display (MID) in the instrument cluster. Under normal highway operating conditions the system will regenerate itself and remove NOX and Particulate Matter automatically. Under slow speed or long idle times the system may require the vehicle operator to initiate a DPF regeneration cycle manually. The DEF tank has a 4.2 gallon (16L) capacity and will need to be replenished when the DEF supply runs low. DEF usage will be approximately 1% of the diesel fuel consumption, or approximately 1 gallon of DEF for each 100 gallons of diesel. Only DEF that carries the seal of certification from the American Petroleum Institute (API) should be used. Vehicle operators should familiarize themselves with the monitoring system (see the owners manual or decal in cab) to ensure smooth efficient operation of the vehicle.

Exhaust Routing Description
The exhaust system routes to a horizontally mounted package containing a stainless steel DPF and SCR Chamber on the right side of the chassis. The exhaust tail pipe then exits to the rear on the right side of this package.

DPF Regeneration Options for N Series with 4HK1 engine

Manual Regeneration Only for GSE Vehicles
Provides programing for disabling automatic DPF regeneration for GSE applications. DPF will NOT regenerate automatically. DPF can only be regenerated using manual DPF switch, with vehicle parked with parking brake engaged. This function can also be enabled by the Isuzu Dealer via IDSS service tool.

Automatic Regeneration in PTO Mode(Stationary)

Provides programing for automatic regeneration of DPF while in stationary PTO mode. Used for applications with a PTO operating for long periods of time with operator out of cab and away from the vehicle. Requires high PTO power draw (15 or more horsepower) and sustained engine speed above 1,000 RPM. This function can also be enabled by the Isuzu Dealer via IDSS service tool.

Automatic Regeneration in PTO Mode(Mobile)

Provides programing for automatic regeneration of DPF while in mobile PTO mode used for applications with a PTO operating in mobile mode for long periods of time (i.e., sweepers or line painters). Requires high PTO power draw (15 or more horsepower) and sustained engine speed above 1,000 RPM. Option can be programmed at the time of order, or by dealer via IDSS service tool.

DPF (Diesel Particulate Filter) dimensions:
O.D. : 9.0 inches
Length: 25.1 inches
Material: Stainless Steel

SCR Chamber dimensions:
O.D. : 10.0 inches
Length: 22.6 inches
Material: Stainless Steel

Exhaust Cooler
At the end of the exhaust system is an exhaust gas cooler. This device will lower exhaust gas temperatures created during regeneration to pre 2007 exhaust gas temperature levels.

Vertical Exhaust System
An optional vertical exhaust system is available on the NPR-HD, NPR-XD, NQR and NRR . I will use 24 inches of CA from the back of the cab to the back of the Exhaust system.

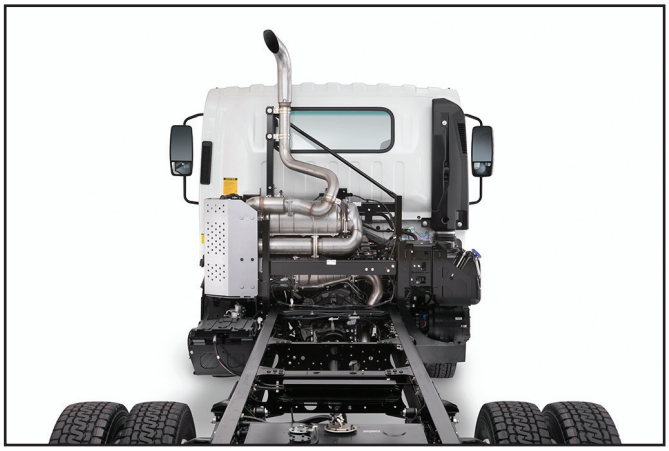


Figure 24.20 N-Series Diesel Vertical Exhaust

ELECTRICAL

Electrical System:
The electrical system is 12 volt negative ground.

Batteries:
Two 12 volt 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.

Alternator: 12V-140 AMP output with integral regulator.

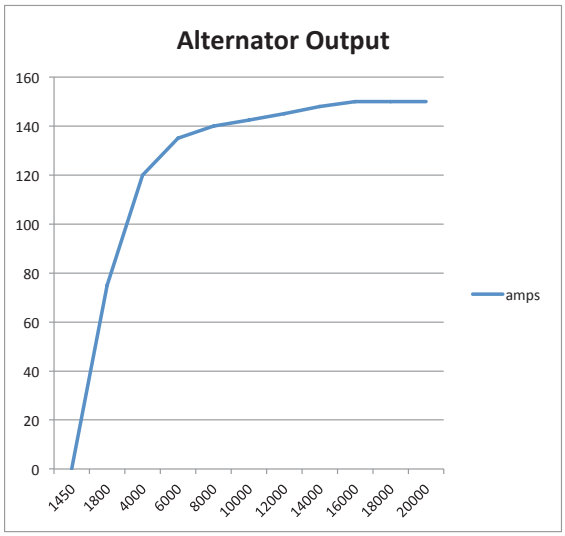


Figure 24.21 N-Series Diesel Alternator Output Curve

Lighting Specifications:

- Flush surface halogen headlamps with integral parking, turn signal, and cornering lamp
- 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
- Back up alarm electrical connector
- Body mounting electrical connector
- Trailer brake wiring connector
- Auxillary power connector behind dash

TIRES/WHEELS

Standard Tire Specifications:

Model	Cab Chassis
Mfg.	Yokohama Ty287 Bridgestone M895

*Manufacturer specification is not permissible.

Type	Low Rolling Resistance Tubeless Steel Radial
Size	225/70R19.5F
Ply Rating	(12pr)
Tread	FT /RR All season
Max. Inflation Pressure	See note below
Maximum Rating per tire:	@ 95 psi
Front	3,640 lbs.
Rear	3,415 lbs.
Rev/Mile	643

Wheel Specifications:

Size (in)	19.5 x 6K
Bolt Holes	6 JIS
Bolt Circle Diameter	8.75 in
Outside Offset	5 in
No. Pc. Rim	1
Rim Type	15° DC
Manufacturer	TOPY
FT/RR Nut Size+	1.6142 in (41 mm) Bud Hex
Rear Stud Size+	0.8268 in (21 mm) Square
Nut/Stud Torque Specs.	325 ft.-lb. (440 N-M)

+O.D. wrench sizes.

CAB FEATURES

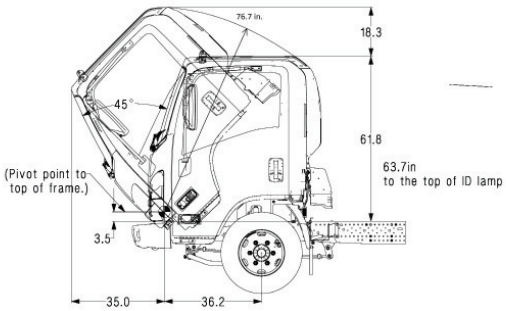
Cab Over Engine Design

The N-Series cab design brings an exciting look to the N-Series product. Based on the “Hexapod Design Concept” the cab was completely redesigned to meet new emerging market demands. Cab panels, radiator grill, headlights, a nd bumper have 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 a pleasing interior color scheme and enhanced vehicle information provided by a new instrument cluster.

The low cab forward (LCF) design used by the N-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 85 degree door swing)

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



NOTE: Roof lights adds 2 inches to overall cab height.

Figure 24.22 N-Series Diesel Cab Tilt Directions

Engine Accessibility

The N-Series 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. The hydraulic brake reservoir is located at the left end of the dash for easy inspection and service.

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 on the end of the dash on the passenger side. 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 upper tinted 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 chassis is equipped with a shift lever interlock system that is activated when the key is in the on position and the brake pedal is depressed.

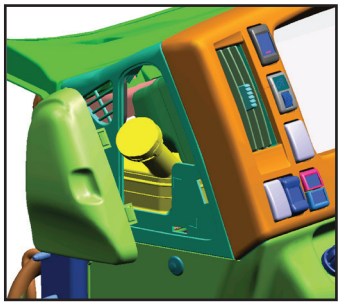


Figure 24.23 N-Series Diesel Brake & Clutch Reservoir

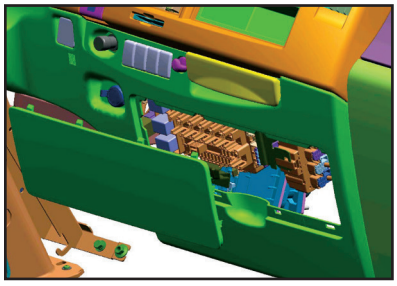


Figure 24.24 N-Series Diesel Cab Fuse Location

The coolant reservoir is located at the back of cab and is also easily checked without tilting the cab.

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 optional air conditioning system uses environmentally friendly 134a refrigerant. A new larger air-conditioning condenser has been relocated vertically and raised for greater protection of this component for improved operation and less maintenance.

Performance:
ITEM DESCRIPTION
Heater 16,400 BTU/hr
Air Conditioner (Option) 16,000 BTU/hr
HVAC system air flow up to 265 CFM

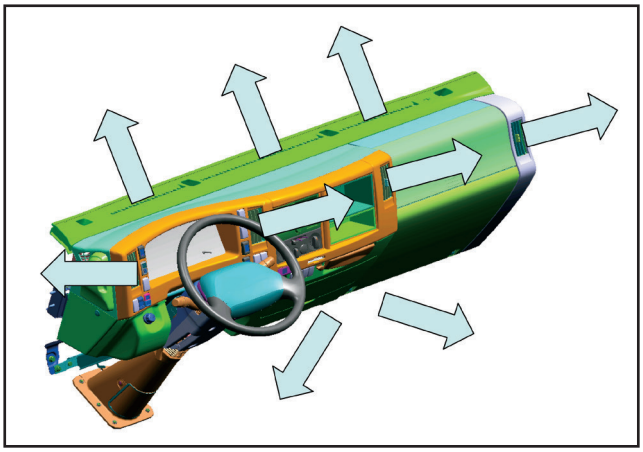


Figure 24.25 N-Series Diesel Cab Ventilation

Interior Trim Features

The N-Series Hexapod cab has been designed for the person who spends all day on the road. The drivers will find the cab has a spacious environment with increased shoulder and head room. The cab is standard with a high back drivers seat and passenger seat. The center passenger seat has a tray mounted on the back side to provide a convenient work area for the driver inside the cab out of the elements.

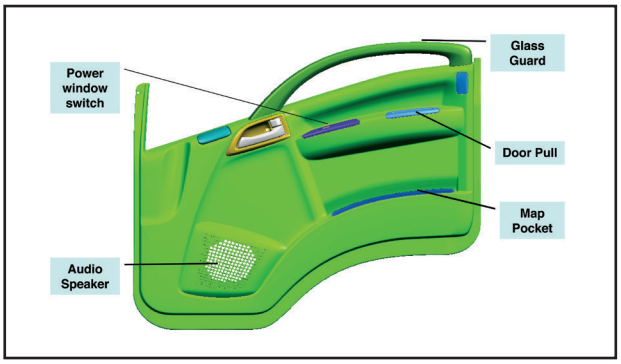


Figure 24.26 N-Series Diesel Cab Door

To enhance driver comfort the seat cushions, have been designed for maximum support. The seat material is a durable Tricot flat woven material l 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. A optional port installed suspension divers seat is available in the standard cab chassis. Additional storage for maps and otherpapers is provided in easy to reach door pockets,seat backs as well as several built in storage areasin the dash. An overhead storage shelf and a rear organizer tray are standard equipment on all N-Series chassis. Seat belt design is enhanced for easier operation. A new interior dome light is installed for a brighter cab in night time operations.

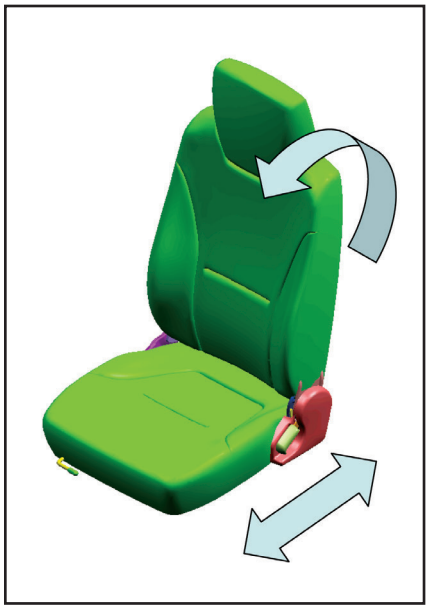


Figure 24.27 N/W Series Diesel Seat Travel Path

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

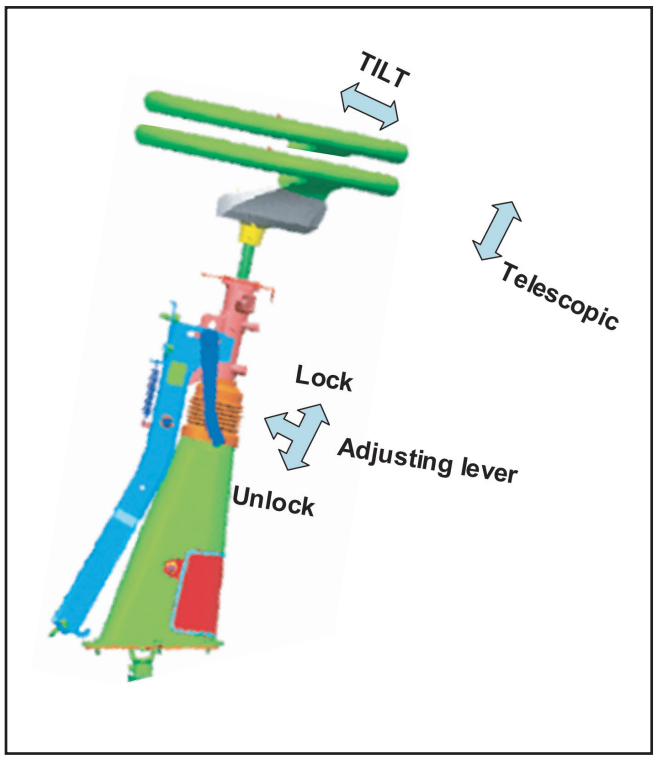


Figure 24.28 N-Series Diesel Steering Column

Figure 24.29 N-Series Diesel Shift Lever

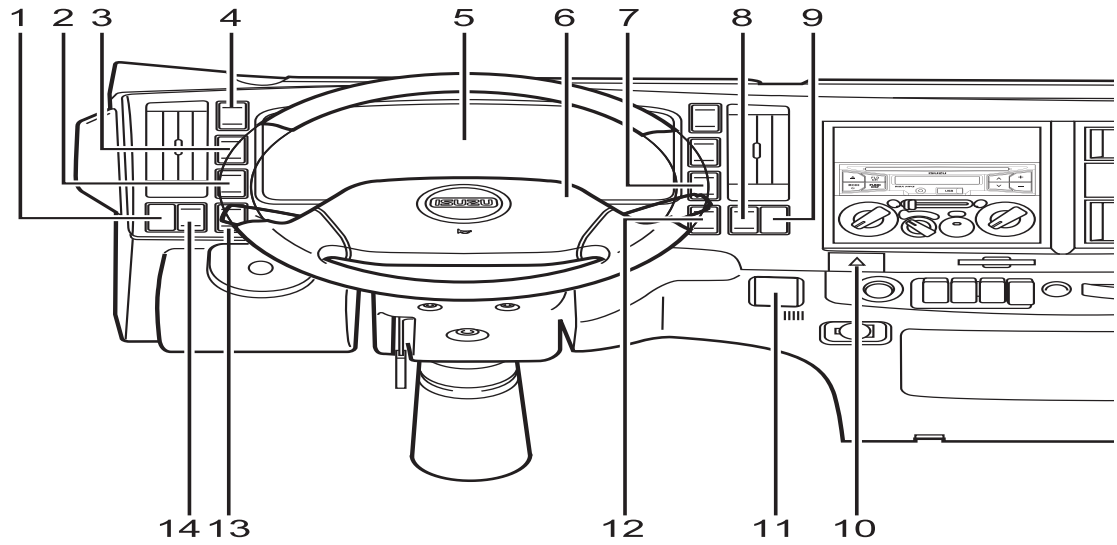
The parking brake handle is located between the drivers seat and the center passenger seat. This location provides an unobstructed floor for increased driver comfort. The rubber floor cover is durable and easy to maintain. A Heavy duty floor mats are standard. The automotive style instrument panel has a low profile design for improved downward visibility. The cab is fully trimmed to provide a quieter environment. A cup holder is 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 coffee cups. The rear cab panel incorporates a coat hook for improved driver comfort.

Figure 24.30 N-Series Diesel Cup Holder

Instrumentation

The instrument cluster of the Hexapod cab has been redesigned and now 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 more 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.

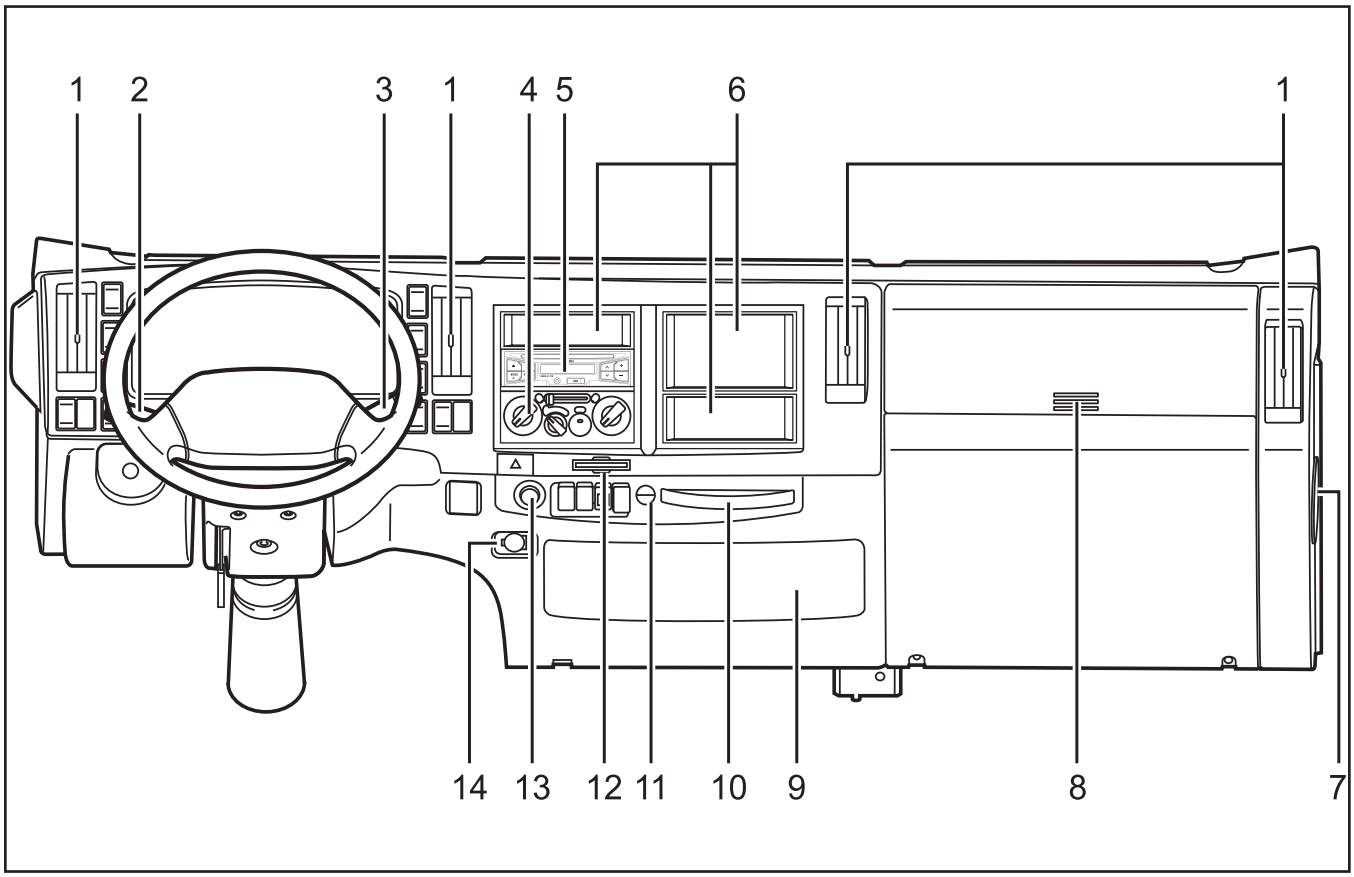
The current operational status of the DPF (Diesel Particulate Filter) and levels of Diesel Exhaust Fluid DEF are also indicated on the MID. Cornering lights are standard to improve night time visibility when the turn signals are operated and headlights are on. Cruise control is standard and the controls 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 is standard equipment. The dash also has a “5 DIN” opening suitable for other electronic equipment.



Dash Panel Switches and Controls

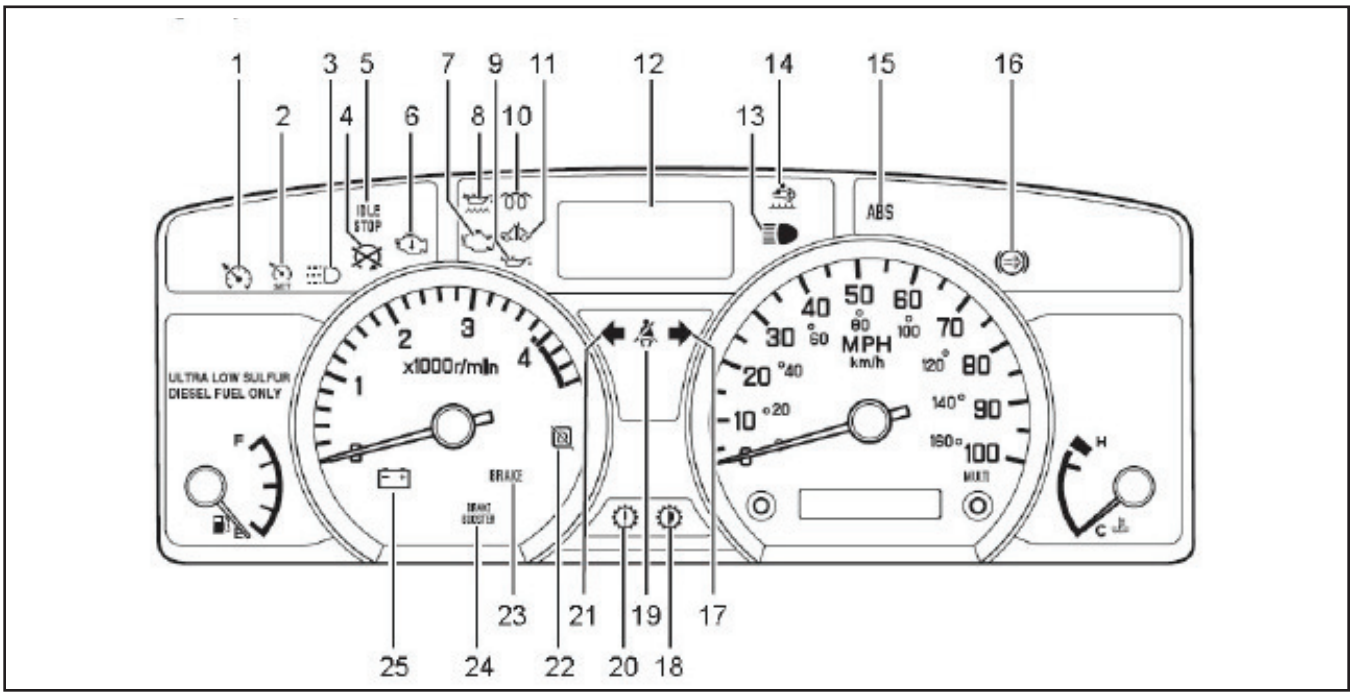
#	Equipment	#	Equipment
1	Instrument panel light level control	8	Outside rearview mirror heater switch (Optional)
2	PTO main switch (Optional)	9	Cruise control main switch
3	PTO/ engine idle up switches on the dash (Optional)	10	Hazard warning flasher switch
4	Rear body interior light switch (Optional)	11	Rear power window switch (Crew Cab only)
5	Instruments, warning lights and indicator lights	12	DPF switch
6	Horn button	13	Miles check switch, Engine oil level check switch
7	Rear power window lock switch (Crew Cab Only)	14	Door lock switch

Figure 24.31 N-Series Diesel Dash Panel and Driver Controls



No. Equpiment	No. Equipment
1. Air Flow Direction Control Lever	7. Windshield washer fluid tank
2. Combination light control switch cruise control set switch/resume switch	8. Glove compartment
3. Exhaust brake switch windshield wiper and wind-sheild washer switch	9. Relay Box
4. Heater Manuel optional air conditioner	10. Cup holder
5. Radio CD/USB	11. Hook
6. Small article storage pocket	12. Card holder
	13. Cigarette lighter
	14. Accessory power outlet

Figure 24.32 N-Series Diesel Instrument Panel



No.	Name	Reference
1.	Cruise main indicator light	
2.	Cruise set indicator light	
3.	Daytime running lights (DRL) indicator light	
4.	Engine alarm (shutdown) warning light	
5.	Idling stop indicator light	
6.	Reduced engine power indicator light	
7.	Check engine malfunction indicator light	
8.	Engine oil level indicator light	
9.	Engine oil pressure warning light	
10.	Glow plug indicator light	
11.	Service vehicle soon (SVS) indicator light	
12.	Multi-information display (MID)	
13.	Headlights high beam indicator light	
14.	Diesel exhaust fluid (DEF) indicator light	
15.	ABS warning light	
16.	Exhaust brake indicator light	2-52
17.	Turn signal and hazard warning indicator light - right	
18.	Automatic transmission fluid (ATF) temperature warning light	
19.	Seat belt warning light	
20.	Check transmission warning light	
21.	Turn signal and hazard warning indicator light - left	
22.	Overdrive off indicator light	
23.	Brake system warning light/Parking brake indicator light	
24.	Brake low vacuum warning light/ Brake booster warning light	
25.	Battery discharge warning light	

Figure 24.33 NPR Series Diesel instrument Panel

Cab Anti Corrosion Protection
The Hexapod cab offers enhanced anti-corrosion treatment to ensure a long service life. This treatment begins with extended use of galvanized steel panels in the cab construction. In addition to more galvanized. panels the galvanizing thickness has been increased. The cab receives a cation electro deposit primer “E coat” and a strong alkali-proof paint for full protection against corrosion. Undercoating has been added in the wheel wells to further protect the cab from road spray and rock chiping. A self cleaning resin doorstep has been used, combined with a plastic support to protect against corrosion in the step wells. All of these added features will result in a cab that will withstand the elements for an extended length of time.

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. New side view mirrors have a breakaway function to protect the cab doors. These large 17 x 8 west coast style mirrors heads incorporate a 11x7 inch flat glass mirror and a 4x6 inch convex mirror in one mirror head. Heated mirrors are an available option.
Cab door handles are the large paddle type that protect the door paint and are easy to operate by a gloved hand.

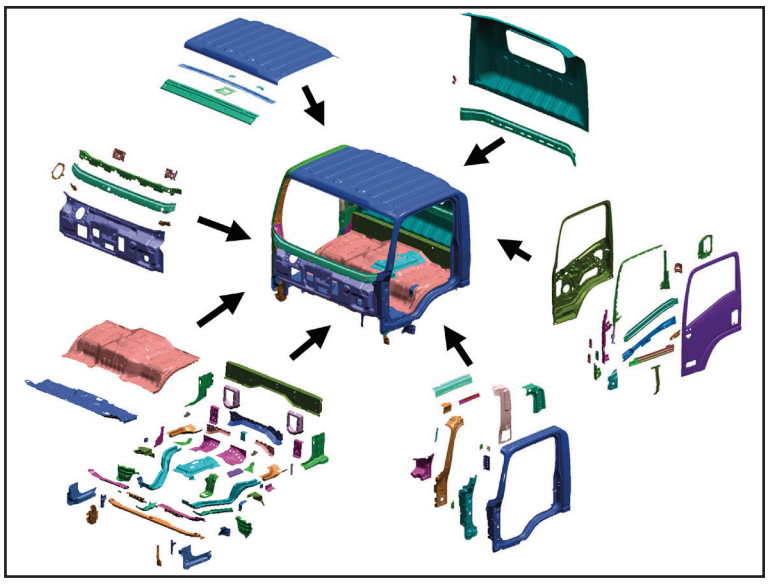


Figure 24.34 N-Series Diesel Cab

Cab Structure
The cabs structural strength is vastly improved for the N-Series Model. The side sill is now a closed section and the under-frame is now constructed of high tension-resistant steel. In making these changes we accomplish 2 important goals, (1) structural strength is maintained in case of a collision and (2) weight is reduced so as not to affect payload.

The cab durability is also enhanced by passing structural elements through the closed sections at the under-frame connection point to the chassis in the vehicle width direction. This arrangement of components improves cab rigidity. (Figure 2.35)

Additional reinforcement in front pillar area from the cowl to rocker panel area has been accomplished. Gussets have been enlarged to increase the connecting rigidity between the pillar area and the cowl. This change reduces cab deformation in case of a collision. (Fig 2.36)

Figure 24.35 N-Series Diesel Cab Structure

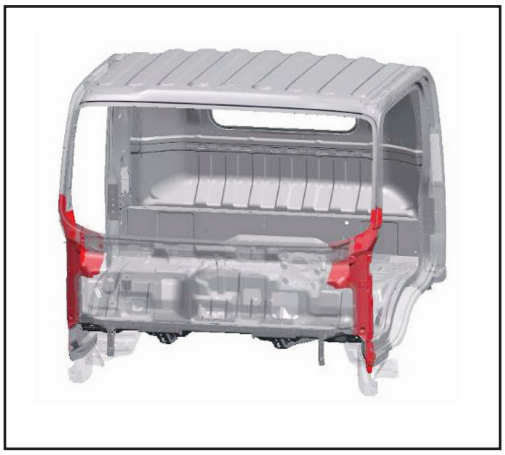


Figure 24.36 N-Series Diesel Cab Structure

Weights for Options

RPO (1)	Option Description	12 NRR Front / Rear Lbs.
I0A	Cross rail horizontal DPF/SCR with vertical exhaust (8)	100 / 100
I1L	Speed Limited to 58 MPH	0 / 0
I2L	Speed Limited to 65 MPH	0 / 0
I3L	Speed Limited to 68 MPH	0 / 0
I4K	Keyless entry	3 / 0
I4L	Speed Limited to 70 MPH	0 / 0
I5K	Suspension seat	18 / 0
I0M	Cold Weather Package (block heater and heated fuel water seperator)	1 / 0
I6K	Locking DEF tank cap	0 / 0
I8H	AM/FM/CD Radio with Ax input/USB port and Bluetooth	0 / 0
I9A	Engine Idle Shutdown (Timer set at 5 minutes for engine shutdown)	0 / 0
I9H	Heated dual remote control mirrors (15” head)	3 / 0
IF4	Air Deflector roof mounted (not available in Crew Cab)	64 / 0
IF6	Fire Extinguisher and Triangle Kit mounted in rear organizer	19 / 0
IG3	Engine Oil Pan Heater (120v 300w)	2 / 0
IH2	Engine emergency shutdown system HWT, LWL, LOP (4)	0 / 0
IK9	33 Gallon Additional Diesel Fuel Tank mounted on LH side 150, 176 wb, std. cab	(7)
IL9	PTO Enable Switch and Engine Idle Up Switch recommended for PTO and Idle applications only (2)	1 / 0
IS0	Heated Mirrors	1 / 0
IU2	Mirror Bracket for 102’’ wide body	1 / 0
IV8	Seat Covers Standard Cab (9)	6 / 0
I1M	Seat Covers for suspension seat Standard Cab (10)	6 / 0
IX2	Rear Body Dome Lamp Switch (6)	1 / 0
IY4	Delete Standard AM/FM/CD Radio	-3 / 0
IY9	Engine Idle Shutdown (Timer set at 3 minutes for engine shutdown)	0 / 0
UZF	Back up alarm	0 / 2
V22	Chrome Grille	1 / 0
I4H	CAN Interface converter	1 / 0
I5L	Locking DEF cap (all keyed alike on multiple chassis ordered together)	0 / 0
I7L	High visibility seat belt (red color, driver seat only, available on standard cab and front driver seat only of crew cab)	0 / 0
I8L	High visibility seat belt (red color, Driver and RH passenger, availble on standard cab and front driver and RH passanger seat only crew cab)	0 / 0

SEO (1)	Option Description	Front / Rear Lbs.
00	Standard model specifications	w/o power windows and power door locks
04	Standard model specifications with power windows and power door locks	Standard chassis weight includes these features
54	In rail fuel tank with power windows, power door locks and air conditioning	80 / 0
64	In rail fuel tank with power windows, power door locks, air conditioning and LSD (3)	80 / 15
74	Side mounted fuel tank w/power windows, power door locks and air conditioning (5)	215 / -124
84	Side mounted fuel tank w/power windows, power door locks, air conditioning and LSD (3) (5)	215 / -109

(1) RPO is Regular Production Option that is stocked in Port inventory.
LSO is Limited Stock Option that is stocked in Port inventory but should be checked for availability and delivery time.
SEO is Special Equipment Option and requires 90-120 day lead time for delivery.
(2) These switches can be port or dealer installed. Please consult the body builders guide and / or the service manual for additional programming options and functions.
(3) LSD factory installed Limited Slip Differential
(4) High Water Temperature (HWT), Low Water Level (LWL) and Low Oil Pressure (LOP)
(5) 176 inch WB std. cab only
(6) RPO must be ordered with Supreme Value Pak and Morgan Fast Track Body Programs
(7) Additional fuel tank mounted on the drivers side frame rail. Available with in rail tank only on 150 and 176 inch standard cab wheelbases (Weights: 150 wb +122 lbs. front and +238 lbs. rear and 176 wb +102 lbs. front and +258 lbs. rear)
(8) Available only with in rail fuel tank and single cab (no crew cab)
(9) Seat covers for std cab
(10) seat covers for suspension seat and passenger seats