



International® CV™ Overview and Walk-around *Study Guide*



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Course Introduction



THE INFORMATION PROVIDED WITHIN THIS COURSE IS FOR TRAINING PURPOSES ONLY. ALWAYS CONSULT THE LATEST SERVICE, DIAGNOSTIC, AND TOOL INFORMATION, LOCATED ON THE INTERNATIONAL® SERVICE PORTALSM, PRIOR TO PERFORMING SERVICE ON ENGINES, VEHICLES, AND EQUIPMENT.

Welcome

Welcome to the Navistar® training course: International® CV™ Overview and Walk-around

This course is intended to introduce parts and service personnel to the International® CV™ and its features.

Objectives

Upon completion of this course, the viewer will be able to:

- Identify the powertrain options available for the International® CV™
- Locate routine service items on the vehicle
- Identify key steering, brake, and suspension system features
- Locate key electrical components and service locations
- Identify key interior and exterior features of the International® CV™
- Describe the HVAC system and controls

Notes

Module 1: Vehicle Introduction

CV Overview

The International® CV™, or Commercial Vocational, is designed with a focus on driver comfort and functional versatility for a range of vocational applications.

The CV™ day cab has a 115-inch Bumper to Back of Cab, or BBC, and the crew cab has a 149-inch BBC.

The CV™ has a Set-Forward Axle, or SFA, and is available with either a 4 by 2 or 4 by 4 axle configuration.

The 34.4" bumper-to-front axle, or BA, improves maneuverability and decreases the turning radius. This makes it easier to maneuver in tight job sites, narrow alleys, loading docks and many other challenging terrains.

Exterior features include a three-piece hood, breakaway mirrors, integrated splash panels to protect the engine compartment, and easy to service headlight assemblies.

The CV™ has been designed with a clean Cab-to-Axle, or CA, for body up-fitting and customization options.

Notes

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Module 2: Engine and Drivetrain

6.6 Overview

The CV™ is powered by the International® 6.6 diesel engine. This 6.6-Liter engine is capable of producing 350 horsepower and 700 pound-feet of torque.

The International® 6.6 is equipped with emissions controls that vary depending on the year of emissions certification.

The engine emission label is located on the air intake manifold and contains relevant engine information including the model year, engine family, displacement, and emissions level.

A copy of the engine emission label is also attached to the passenger-side bulkhead in the engine compartment.

On the 6.6, the oil filter is engine mounted and located near the left-rear of the engine.

The engine oil dipstick has a yellow handle and is located on the upper left side of the engine.

The engine oil fill tube is located on the left, rear side of the engine near the power steering fluid reservoir.

The refill volume is 10 quarts with an oil filter change.

After changing the engine oil, reset the Remaining Oil Life on the Driver Information Center in the gauge cluster.

Air Filter

The intake air filter is located on the right side of the engine compartment. The filter cover is attached with four bolts and easily removed for filter inspection or replacement.

The air restriction indicator displays green normally. As particulates build up on the filter element and restrict air flow, the indicator displays yellow and then red.

After replacing the air cleaner filter, reset the gauge by twisting the black knob clockwise until the gauge is in the green zone.

Notes

Aftertreatment

The aftertreatment system on the International® CV™ is horizontally mounted between the vehicle frame rails, behind the engine.

The aftertreatment system is arranged in a straight-through design. This also allows easy access to the components of the aftertreatment system.

Always follow the appropriate service and diagnostic procedures, found on the International® Service Portal, when working on the aftertreatment system. Service or modifications performed incorrectly may cause serious engine damage. In addition, any modifications to the exhaust and aftertreatment system will void the entire vehicle warranty.

DEF System

The Diesel Exhaust Fluid, or DEF, delivery system supplies DEF for proper operation of the aftertreatment system. Most of the components of the DEF delivery system are mounted on the right side of the vehicle.

The DEF fill tube is immediately forward of the passenger-side door.



THE CAPACITY OF THE DEF TANK IS 6.75 GALLONS, OR 17.9 LITERS.

Engine Exhaust Brake

An engine exhaust brake is optional on the International® CV™.

Manual regeneration functionality for the International® 6.6 is also optional and requires an engine exhaust brake.

Notes

Cooling System

The CV™ has a 578 square-inch charge air cooler and a 730-square-inch aluminum radiator with an integrated, in-tank transmission cooler.

Shrink band type coolant hose clamps self-adjust to changes brought about by expansion and contraction during the coolant system thermal duty cycle.

The deaeration tank, located on the right-side of the bulkhead, is divided into an upper and lower reservoir. Coolant level in the upper reservoir should be at or above the bottom of the indicator arrows.

The lower reservoir will be mostly empty, depending on the operating temperature.

The upper cap is the fill cap and is left-hand threaded.

The lower cap is the pressure relief cap.

The coolant level must be checked when the engine is cold, and the vehicle must be on a level surface.

The International® CV comes standard with an electronically controlled, viscous fan drive, a lightweight nylon engine fan, and premium rubber radiator hoses.



TO PREVENT PROPERTY DAMAGE, PERSONAL INJURY, AND/ OR DEATH, AND TO PREVENT HOT COOLANT OR STEAM, USE ONLY THE FOLLOWING PROCEDURE TO REMOVE THE PRESSURE CAP FROM THE RADIATOR OR EXPANSION TANK. ALLOW THE ENGINE TO COOL FIRST. WRAP A THICK, HEAVY CLOTH AROUND THE CAP. UNSCREW THE CAP SLOWLY TO ALLOW PRESSURE TO RELEASE FROM UNDER THE CAP. AFTER THE PRESSURE HAS BEEN RELEASED, THE PRESSURE CAP MAY BE REMOVED.

The International® CV™ comes standard with an electronically controlled, viscous fan drive, a lightweight nylon engine fan, and premium rubber radiator hoses.

Notes

Transmissions

The International® CV™ can be equipped with one of several Allison vocational transmissions with features tailored to the customer's vocation.

The range of transmissions available include the Highway Series, the Emergency Vehicle Series, the Rugged Duty Series and the Motorhome Series.

Each series offers features appropriate for the vocation such as Park Pawl, Power-Take-Off Provision, or PTO, and Double Overdrive.

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Module 3: Suspension, Steering, and Braking Systems

Suspension System

The International® CV™ comes standard with a parabolic taper leaf front suspension or a "Shackle type" suspension, with shock absorbers tuned to match the suspension.

A 7,500 pound front driving axle is available as well.

An 11,000 pound single vari-rate spring suspension is standard on the International® CV™.

Optional rear spring suspensions rated at 13,500 and 15,500 pounds are also available. Rear shock absorbers with spring suspensions are optional.

Rear air suspension is also available. The International® Ride Optimized Suspension, or IROS, is recommended for on-road applications only and is offered at ratings of 12,000, 13,500, and 15,500 pound capacity.

Rear shock absorbers are included with all air suspensions.

If equipped, the air dryer is mounted just behind the front bumper on the right side of the vehicle.

Typically, the air tank is located just behind the driver-side door step.

Drain the air tank by opening the drain valve on the end of the tank. Close the drain valve after all moisture has been expelled.

Notes

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Steering System

The steering system on the International® CV™ is hydraulically assisted and utilizes multiple lubrication points.

The standard Steering Column offers tilt functionality.

The steering intermediate shaft connects the steering column to the power steering gear. The slip joint on the steering intermediate shaft should be lubricated regularly.

The CV™ comes standard with a Bosch power steering gear.

The steering gear is connected to the steering intermediate shaft and the drag link.

The steering gear dust shield should be lubricated regularly. Refer to the appropriate service manual for the proper procedure.

The tie rod is a three-piece assembly consisting of a rod and two end units with spherical joints that connect the steer wheels to each other. The size of the rod ends depends on the front axle capacity.

The hydraulic power steering pump is a belt driven pump that provides fluid pressure and flow for the power steering gear and the hydraulic brake booster. The capacity of the pump is selected based on the front axle rating.

A remotely mounted, power steering reservoir is attached to a bracket near the radiator assembly. The semitransparent reservoir allows operators to quickly check the level of power steering fluid in the system. A power steering fluid filter is standard on the CV™.

Brake System

The International® CV™ is equipped with hydraulic brakes utilizing a split system to protect against total loss of braking in the event of a leak.

The system includes a four channel Anti-Lock Brake System, or ABS, traction control, a Bosch hydro-max brake booster, and a master cylinder.

The ABS control module is mounted to the left-side frame rail with the rest of the system inside the engine compartment."

Notes

Module 4: Chassis and Vehicle Exterior

Chassis

The International® CV™ is offered in two axle configurations; the standard four by two and the optional four by four.

I-beam type, non-driving front axles are available in the standard 6,000 pound capacity and optional 7,000 or 8,000 pound capacity.

An optional, 7,500 pound capacity, front drive axle is also available.

Front drive axle components should be greased as part of routine maintenance. There are five grease zerks on each side of a 4 by 4 axle. Three of the zerks can be accessed with a straight grease gun fitting. For the other two zerks, a 90-degree fitting is required.

Rear axle variations available for the CV™ include: single-reduction axles from 10,000 to 15,500 pound capacity.

A 50,000 PSI C-channel frame rail is standard.

The frame rails have a straight top flange and a contoured bottom flange to provide stiffness in the middle and more flexibility on the ends.

All frame rails are custom pierced to eliminate unnecessary holes and help maintain rail strength. A range of wheelbases is available from 141 inches to 235 inches.

Straight frame rails with no rivets on the top flange provide a clean CA for easy vehicle upfitting.

With the optional Snow Plow Prep Package, all necessary holes for a snow plow mounting are provided on the frame.

The package also includes wiring for roof mounted lights.

Notes

Cab Exterior

The International® CV™ is offered with two cab variants, a traditional day cab and a four-door crew cab.

Wide load, manual folding and extending mirrors are standard.

Options include power mirror adjustment, heated mirror heads, and turn signal indicators.

Single piece driver and passenger windows allow for optimized placement of the side mirrors and increased visibility.

Power windows are required with the crew cab and with Diamond level interior on the standard cab.

The hood features three fiberglass exterior panels, which allow for individual panel replacement rather than replacing the entire hood in the event of damage.

The hood hold open rod has a safety lock that must be disengaged to close the hood. Simply press up on the mechanism until it clicks into place and then carefully lower the hood from the front.

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Module 5: Electrical System

Electrical System Components

The electrical system of the International® CV™ utilizes serial data communication networks to provide a reliable and efficient way for various components of the vehicle to communicate and share information.

The system uses a variety of communication buses and a Body Control Module, or BCM.

Detailed information is available in the Service Manual and in a series of CV™ Electrical System training modules on the Learning Management System.

The battery pack for the CV™ is located below the steps on the left side of the vehicle. The battery box cover is easily removed without tools.

Two 12-volt batteries are standard.

The remote jump start stud eliminates the need to remove the battery box cover when jump starting is required. A tethered plastic cap protects the stud from water, salt spray, and dirt.

If the vehicle is equipped with an Engine Block Heater, the Block Heater Socket can be found below the driver's door.

The International® CV™ uses brush type 150 amp or 220 amp alternators. Dual alternators, one of each amp rating, are also available.

SAE blade-type fuses provide dependable, positive wiring protection.

Vehicle fuses in the CV™ are in one of four fuse blocks.

On the left side of engine compartment, near the forward bulkhead, are a primary and a secondary fuse block.

The other two fuse blocks are inside the cab at both ends of the instrument panel.

The instrument panel fuse block covers can be removed without tools.

For specific information on the location of circuit fusing and relays, please refer to the appropriate service information available on the International® Service Portal.

Module 6: Cab Interior

Electronic Gauge Clusters

There are two versions of the Gauge Cluster available: a base cluster with a monochrome Driver Information Center and a premium cluster with a color display.

Both gauge clusters are designed to be fully visible through the steering wheel.

In the bottom center of the gauge cluster is the Driver Information Center. On the standard cluster, scroll through the display options by rotating the stem on the left of the speedometer. Some items can be reset by pressing in on the stem.

Display options include speed, trip mileage, fuel range, average fuel economy, remaining oil life, remaining fuel filter life, DEF level, transmission fluid temperature, and engine hours.

Units displayed can be changed from imperial to metric.

In the optional premium gauge cluster, the Driver Information Center has many more display options.

The Driver Information Center is navigated by using the steering wheel controls on the right-side of the steering wheel.

Air Bags

A driver-side air bag is standard, and a passenger-side air bag is required with any passenger seat. A passenger-side air bag is also required with the crew cab.



VEHICLES WITH FEATURE CODE 16400 - PASSENGER SEAT OMIT WILL NOT HAVE A PASSENGER SEAT INSTALLED.

When appropriate, the passenger-side air bag can be disabled with the Passenger Air Bag Disable Switch. Refer to the appropriate Service Information for the proper procedures.

Notes

Passenger Seat and Controls

A two-person passenger seat with fold-down armrest is standard on the International® CV™.

Folded down, the seat back provides armrests, device storage, and cup holders.

The lid folds up for access to additional storage, a 12-volt receptacle and 2 Universal Serial Bus, or USB, ports.

The seat back folds up to provide seating for a second front seat passenger.

The seat bottom folds up for access to more storage.

With Diamond level interior on a crew cab, an optional floor mounted console provides moveable cup holders, cell phone storage, a 12 Volt receptacle, 2 USB Ports, and a hanging file folder compartment.

Power Door Locks and Windows

Power door locks are standard on the International® CV™. Power windows are optional with a Classic day cab and required with a crew cab or Diamond level interior.

The driver's door pod includes controls for all powered windows, door locks, and powered mirrors when specified.

Notes

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Key Fob

The Remote Keyless Entry, or RKE, system on the CV™, which allows operators to lock and unlock the doors from outside the vehicle, is optional with the Classic level interior and is required with Diamond level interior.

Remote Start is optional with Diamond Level interior trim and provides a button on the RKE Transmitter, commonly referred to as a key fob, to start the engine while outside of the truck.

Driver Controls

The CV™ features a Light Control Module, or LCM, that allows the operator to control the interior lights, marker lights, headlamps, and fog lamps, if equipped.

The brightness of the gauge cluster can be adjusted by scrolling the thumbwheel down or up.

On the left side of the steering wheel is the multi-function turn signal switch. This is used to control the turn signals, high beam headlights, windshield wipers, and windshield washer.

The CV™ has a shift lever on the right side of the steering wheel. To shift gears, the operator pulls and holds the lever away from the instrument panel and then moves it up or down to the desired gear.

Controls for cruise control are on the left side of the steering wheel. With Diamond level interior, controls for phone and the Driver Information Display are on the right side of the steering wheel.

Notes

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Conclusion

This concludes the Navistar® training course: International® CV™ Overview and Walkaround

Thank you for your participation.

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