



DIESEL Injector Nozzle Tester



**OPERATING
INSTRUCTIONS / MANUAL**



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3. Priming Handle Pin - 1 No.
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5. Spare set of 'O' Rings, Flat Ring and D.V. Joint
6. Operation Manual

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IMPORTANT INSTRUCTIONS

1. If the needle of the pressure gauge is falling down very fast and the nozzle tester is not able to develop & hold pressure, it means there is back leakage due to some dirt / foreign particle resting on the delivery valve seat. In this case just clean the delivery valve seat and try again, problem should be sorted (Remedy mentioned below).
2. Do not hold pressure in the nozzle tester when not in use, else it may damage the 'O'Ring of isolating valve.
3. After opening the packaging if the needle of the pressure gauge is found dislodged from the pressure gauge, remove glass & refix the needle of the pressure gauge with the pointer end of the needle pointing at 0 on the gauge, then use the back side of a screw driver & gently hammer the needle back in place, fixed at the center and pointing at zero. (Note : Calibration of the pressure gauge will not be affected by this procedure)
4. Do not do rapid priming with isolating valve open, else pressure gauge can be damaged or calibration can be affected.

REMEDY

Step 1 : Open the Tester assembly from the Delivery valve holder & remove the delivery valve pin **Step 2** : Clean with Diesel Oil & Refit the delivery valve & delivery valve holder **Step 3** : After cleaning, fill pure diesel / calibrating oil in the reservoir **Step 4** : Open bleeder screw and do rapid priming with handle till bubble free oil flows from the outlet adaptor with typical delivery valve sound (chick...chick...chick) **Step 5** : If the typical delivery valve sound is missing, repeat the above mentioned steps again till you don't achieve characteristic sound.



1 GENERAL

1.1 APPLICATION

Nozzle tester is used to adjust injector nozzle opening pressure, nozzle seat tightness and to carry out leakage, spray-pattern atomisation repetition and (chatter) characteristic tests.

For P, R, S & T nozzles (Pressure gauge ranges 0-400 bar/ 0-420 kgf/cm² and 0-5700/6000psi, 0-600 bar

1.2. DESCRIPTION

The nozzle tester consists of : injection pump mounted on a rigid base and operated by a hand lever, Transparent / Fuel Container with filter, Three way shut-off valve and pressure gauge.

The Pressure gauge can be cut out with the shut-off valve by turning the knob completely clockwise. Turning the knob $\frac{1}{4}$ turn counter-clockwise will open the pressure gauge.

1 INITIAL OPERATION

Fill the Fuel container with clean test oil or clean diesel.

Opening the Airvent Screw

Operate hand lever of nozzle tester until bubble free oil flows from the bleeder bore, provided at the back. If reqd slightly open the oil container, to allow air trapped inside the nozzle tester.

Tighten bleeder screw and continue pumping until oil without bubble emerges from the delivery adapter or H.Pr. Pipe

A nozzle holder or injector valve can now be connected to the tester by means of the appropriate delivery line.



2. ADJUSTING AND TESTING INJECTION NOZZLES

2.1 CLEANING THE NOZZLE

Remove the special rust-preventative grease completely from new or reconditioned nozzles by washing them in clean oil; clean used nozzles of carbon and dirt and like wise in oil or preferably can be cleaned with ultrasonic cleaning equipment. Then dip nozzle Needle in clean fuel oil & insert into body, nozzle needle and Nozzle body are lap fitted to each other & must not be replaced individually.

CAUTION!

When pressure gauge is open to pressure, slightly open shut off valve to increase and decrease pressure slowly or gauge may be damaged. **DON'T OPEN THE SHUT-OFF VALVE WHEN RAPID HAND LIVER MOVEMENT IS TAKING PLACE FOR TESTING CHATTERING & SPRAY PATTERN OF NOZZLE.**

2.2 TESTING WITH THE NOZZLE TESTER

Following are the tests for injector:

1. Opening Pressure.
2. Leakage Test
3. Chatter characteristic and spray pattern of the nozzle.

DANGER OF EXPLOSION!

Nozzles are tested and adjusted with the accompanying nozzle holders. Before clamping nozzles in the nozzle holders, see that sealing face is clean and undamaged.



If nozzles only are delivered for testing, the following nozzle holder or quick clamping devices can be used.

Nozzle Size	Nozzle Holder Part Nos.	Quick Clamping device BOSCH Part Nos.
R	0431 101 010	0681 203 006
S	0681 243 005	0681 243 003
T	0681 343 002	0681 243 004

3. TEST PROCEDURE

Place nozzle on sealing face of Nozzle holder, screw on cap nut first by hand-centering nozzle and then tighten with well-fitting torque wrench.

For Nozzle holder with dowel pins, first completely release nozzle spring, then fit nozzle

The Tightening torque for the cap nut should be :

Nozzle size

R	6-8	kgf. m.
S	7-9	kgf. m.
T	10-14	kgf. m.
U	20-22	kgf. m.
V	50-55	kgf. m.
W	70-75	kgf. m.

Now connect nozzle holder with appropriate delivery line to the tester. To test the nozzle for jamming, press the hand lever of nozzle tester down forcefully several times (about 6-8 times a second) with pressure gauge shut off by turning the knob completely clock wise i.e. shut of position.

If the needle is free, the nozzle should chatter with a shrill whistle. If this is not the case, loosen the cap nut, turn the nozzle and re-tighten the cap nut.



4.1 OPENING PRESSURE

The opening pressure is given in the operating specifications for the engine, and should be adjusted accordingly. In some cases, it is also stamped on the nozzle holder body.

With the pressure gauge open to pressure, slowly depress the hand lever until nozzle ejects with slight chattering. Read of opening pressure on pressure gauge. If reading differs from specified opening pressure, either the adjusting screw must be turned accordingly or the shims removed or added adjust opening pressure to specification by turning the adjusting screw or by adding or removing shims to change the total thickness.

CAUTION : When pressure gauge is open to pressure, increase or decrease the pressure slowly otherwise the gauge can get damaged.

4.2 LEAKAGE TEST

Operate hand lever of nozzle tester until the pointer on the pressure gauge indicates 20 kgf/cm² (285 psi) below the specified opening pressure. The nozzle does not leak if no drop of oil falls from the nozzle tip within 10 seconds.

4.3 CHATTER CHARACTERISTIC & SPRAY PATTERN TEST

For the test, it is essential to shut off the pressure gauge when the lever is operated slowly (roughly) one to two downward movements per second), all nozzles should chatter at the slow lever operation, the spray need not yet be even nor well atomized.

The spray pattern can only be assessed when the lever is moved rapidly (4-6 downward movements per second). The spray pattern for pintle and throttle nozzle should be even and well atomized; for hole type nozzles, it should be full and finely atomized.



WARNING

Keep hands away from spraying nozzle !

The spray from a nozzle can penetrate deep into the flesh of the fingers or hand & destroy the tissues, test oil entering the blood stream can cause blood poisoning.

5.1 MAINTENANCE

Absolute cleanliness is essential while testing. The work area must be free from chips and dirt. Only clean test oil should be used.

The filter element in the fuel container must be replaced from time to time. When first using fresh test or fuel oil, flush the oil of the tester by operating the hand lever, spraying into space with no nozzle attached.

At regular intervals depending on use (possibly every 1 to 2 months), the tester should be served to have its measuring accuracy checked.

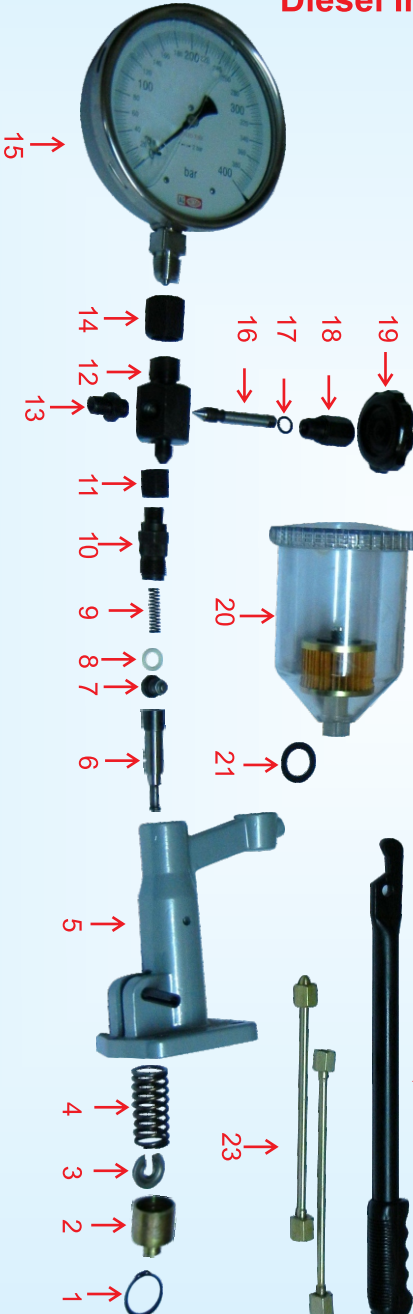
5.2 WARRANTY

We guarantee that Nozzle Tester meets International standards & technical specifications, it is in faultless condition within our Terms & at the time Delivery. The equipment is to be operated and maintained according to its operating instructions.

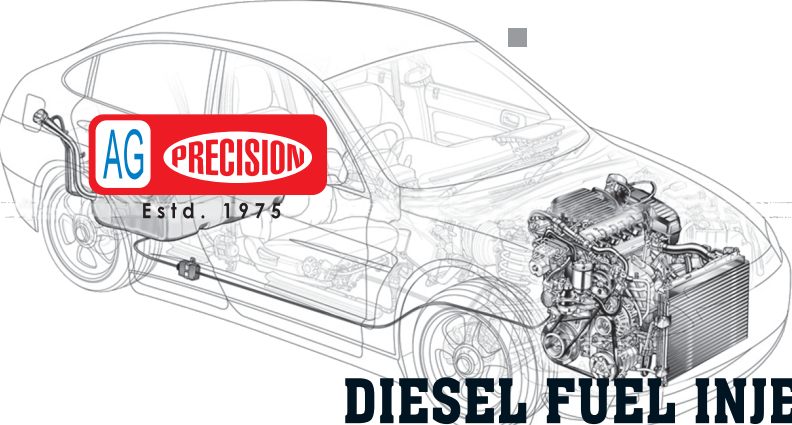
We request you to direct any complaints, with reference to any claim under warranty and with purchase date, to our authorised representative.



Diesel Injector Nozzle Tester Parts List



1. Circlip
2. Piston
3. Lower Plate
4. Plunger spring
5. Aluminum main housing
6. Bosch Plunger / element
7. Bosch Delivery Valve (DV)
8. DV Joint
9. DV spring
10. DV Holder
11. Union Nut
12. Main union body
13. Outlet delivery adapter
14. Pressure gauge nut
15. Pressure gauge
16. Isolating valve pin
17. Isolating valve O ring
18. Isolating valve body
19. Isolating valve knob
20. Reservoir with Bosch filter
21. Reservoir flat ring
22. Priming handle
23. High pressure connection pipes (M12 & M14)



DIESEL FUEL INJECTION TEST EQUIPMENT

Test Bench People





“The performance of a diesel engine depends upon its fuel injection system. High quality ‘AG Precision’ test benches help you to calibrate diesel fuel pumps and injectors with absolute accuracy for optimum engine performance.”

About Us ●●●●

Since its inception in 1975 under the able vision of its partners, Indian Machine Tools has come a long way in establishing itself as a leading manufacturer, supplier and exporter of diesel fuel injection test equipment. Today it stands as one of the most respected, recognized and valued names in this industry with clientele all over the world. The brand name ‘AG Precision’ under which all our products are manufactured and sold is synonymous with high quality and accurate products which give trouble free service for years and years.

We are now firmly established as the market leaders in the Indian sub continent supplying to Technical institutes all over the country, Indian Army, Indian Navy, Railways, Western Coal Field, COFMOW, Stanadyne, Escorts R & D Centre, Usha Intl., Apollo Intl. etc. under government tenders as well as to neutral workshops all over the country, our test benches can be found installed in each and every city of the country.

We regularly export our products to over 90 countries worldwide with the biggest markets being North America (USA, Canada, Mexico), Europe (UK, Germany, France, Italy, Russia, Austria and many more), South America (Brazil, Argentina, Colombia, Chile), Australia, Africa and the Middle East. We have only received excellent feedback from customers worldwide for our quality products and service.

“All Electronic Simulators, FIP Calibrators & Computer Softwares are designed & developed by ‘Godrej’ exclusively for IMT”



‘AG Precision’ Test Benches Information Introduction ●●●●

All our test benches have been designed for quick, accurate and economic operation with a quality target of zero defects. Our benches are capable of testing a wide range of diesel FIP pumps such as all types of Inline, DPC Rotary and Distributor / VE pumps up to 12 cylinders. With our new range of multipurpose and dedicated common rail test benches one can calibrate and test the newer Common rail pumps and injectors as well electronic VE pumps / EDC pumps, such as the Bosch VP series pumps, etc..



Quality Control ●●●●

All our Diesel FIP test benches are assembled using the **best quality inputs of internationally renowned brands** such as:-

- Motors: ABB
- AC Frequency / Electronic Drives: Schneider
- Switch Gears: Cutler Hammer / L&T
- Belts and Pulleys: Fenner / Gates
- Gear Pumps: Dowty
- Borosilicate Glass Burettes
- 'SKF' high speed bearings
- Japanese Taper Roller Bearings

Benefits & Features ●●●●

- AG Precision Test Benches are vibration free and very quiet in operation
- All models have high effective driving torque even at low speeds, they provide maximum measurement accuracy for setting all types of Euro I, Euro II, Euro III, Euro IV & Euro V pumps and injectors
- Our test benches have good even running characteristics, provide exact speed control, high driving power, high torque and have a stiff non – distorting bed, hence guaranteeing precise and accurate adjustment of pumps, governors, timing devices, etc.
- Have robust electronic controls with touch button control panel
- Rugged construction and user friendly design – While manufacturing our test benches we are observing and meeting ISO 4008 specifications

Other Quality Features ●●●●

- Special High Voltage Protection Device with Torque Multipliers for AC Drives
- Pump mounting bed is made all out of Steel
- Gear box gears are hard and ground made out of special alloy steel, two speeds with neutral position
- The main bed of our test benches is fabricated all out of steel which is tough and rugged, no cast iron is used which is Brittle
- All electrical wires and accessories are fire proof. All electronic simulators and instruments are calibrated with oscilloscope to get accurate results
- High Pressure Pipes are as per ISO specifications
- We take utmost care during machining & grinding of component - main shafts, gears, etc. are made out of alloy steels, which are hard & ground. All the moving parts like: Fly Wheel, Pulleys, etc. are well balanced. All bored & keyed components are assembled with proper tolerances. Adequate power and torque with calibrated instruments are major factors responsible for accurate results





12 Cylinder Test Benches



MPC 1200 - Multipurpose Computerized Test Bench

Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps as well as EDC (Electronic Diesel Control) pumps.

Features and Specifications:

- No. of cylinders: 12
 - Drive: AC Frequency / Electronic drive
 - Main Motor: 15 HP / 11.2 KW
 - RPM: Variable from 0 – 5000 RPM
 - Pressure Gauges: Digital and Analog.
 - Fuel Supply Motor: 1.5 HP
 - CE Certified design of Digital LCD display, PLC & Test bench software developed in collaboration with "Godrej India"
- Computer display of all parameters. Test results can be saved and printed
 - Two modes of testing available for diesel pumps: Automatic and Manual, In auto mode user can preset 8 sets of parameters like RPM & Strokes
 - Oil collected in test tubes can be electronically / automatically drained through the computer
 - All pressure gauge outputs displayed digitally on the computer screen.
 - Heater & Chiller precisely controls the preset fuel temperature with auto cut off system which maintains the temperature at $40^{\circ} \pm 1^{\circ} \text{C}$
 - Stroke counting and stroke time counting facility operated through the test bench computer software
 - Return flow of rotary, VE & common rail pumps is measured digitally in CC/min and displayed on the computer screen
 - Digitally Indicates common rail pressure on computer screen as well on CRT 7000 Simulator



FIP Calibrator



CRT 7000



EDC 1100



12 Cylinder Test Benches



EPS 1200 E

Capable of calibrating all Inline, Delphi rotary, Bosch & Zexel V.E., Bosch 'P' type pumps & more.

Features and Specifications:

- No. of cylinders: 12
- Drive: AC Frequency / Electronic drive
- Main Motor: 15 HP / 11.2 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1.5 HP

(Also available in computerized variant)



EPS 1200 CR

Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps as well as EDC (Electronic Diesel Control) pumps.

Features and Specifications:

- No. of cylinders: 12
- Drive: AC Frequency / Electronic drive
- Main Motor: 15 HP / 11.2 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog

- Fuel Supply Motor: 1.5 HP
- Test bench comes fitted with the CRTK 7000 test bench kit for common rail testing. The kit includes (a) Bosch CPI common rail pump along with a foundation suitable for all types of Common rail pumps and a suitable coupling, (b) Bosch fuel rail fitted with a pressure sensor and fuel rail pressure control valve / solenoid / DRV, (c) CRT 7000 electronic simulator for driving common rail injectors, pumps and fuel rail, (d) All high pressure pipes, rail return pipe, injector output delivery and return adaptors, all electrical couplers for different kinds of common rail injectors / pumps of Bosch, Delphi, Denso and Siemens make
- Test Bench also comes fitted with the EDC 7000 Simulator for driving and testing of Electronic diesel control / EDC electronic VE pumps such as the Bosch VP series pumps – VP 36, VP 37 etc.
- Pressure developed in the system while Common rail testing can be regulated from 0 – 2000 BAR
- The main testing area of the test bench is well shielded with an unbreakable transparent acrylic shielding, which can be opened / closed when desired. This is for the safety and protection of the operators.



8 Cylinder Test Benches ●●●●



MPC 800 - Multipurpose Computerized Test Bench

Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps as well as EDC (Electronic Diesel Control) pumps.

Features and Specifications:

- No. of cylinders: 8
- Drive: AC Frequency
- Main Motor: 7.5 HP / 5.5 KW
- RPM: Variable from 0 – 5000
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP
- CE Certified design of Digital LCD display, PLC & Test bench software developed in collaboration with "Godrej India"

- Computer display of all parameters. Test results can be saved and printed
- Two modes of testing available for diesel pumps: Automatic and Manual, In auto mode user can preset 8 sets of parameters like RPM & Strokes
- Oil collected in test tubes can be electronically / automatically drained through the computer
- All pressure gauge outputs displayed digitally on the computer screen
- Heater & Chiller precisely controls the preset fuel temperature with auto cut off system which maintains the temperature at $40^{\circ} \pm 1^{\circ} \text{C}$
- Stroke counting and stroke time counting facility operated through the test bench computer software
- Return flow of rotary, VE & common rail pumps is measured digitally in CC/min and displayed on the computer screen
- Digitally Indicates common rail pressure on computer screen as well on CRT 7000 Simulator



DD 800 CR - Multipurpose dual operator test bench

- Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps as well as EDC (Electronic Diesel Control) pumps.

Features and Specifications:

- Double Diamond is a 2 in 1 time saving test bench, one side is used for testing diesel pumps such as inline, rotary, EDC (euro I, II, III) etc.

driven by independent 7.5 HP motor, AC frequency drive, soundless 1 HP gear pump motor. This side is also equipped with EDC 1100 simulator mfd. by Godrej for testing EDC pumps

- Second side is euro IV compliant for testing all types of common rail injectors & pumps. It is driven by independent 5 HP motor and AC frequency drive with acrylic shielding. This side comes fitted with the complete CRTK 7000 testing kit manufactured by Godrej
- Both sides of the test bench can be operated simultaneously by two operators independently for maximum efficiency



8 Cylinder Test Benches ●●●●



CRDI 800 EDC Multipurpose test bench

Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps as well as EDC (Electronic Diesel Control) pumps.

Features and Specifications:

- No. of cylinders: 8
- Drive: AC Frequency / Electronic drive
- Main Motor: 7.5 HP / 5.5 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP

NMT 800 E

Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type and more.

Features and Specifications:

- No. of cylinders: 8
- Drive: AC Frequency / Electronic drive
- Main Motor: 7.5 HP / 5.5 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP

(Also available in computerized variant)

CRDI 800 E

Capable of calibrating all types of diesel fuel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps.

Features and Specifications:

- No. of cylinders: 8
- Drive: AC Frequency / Electronic drive
- Main Motor: 7.5 HP / 5.5 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP

(Also available in computerized variant)





8 Cylinder Test Benches ●●●●



With swiveling console



Without swiveling console

CRDI 600 E

Capable of calibrating all types of diesel injection pumps & injectors like Inline, Delphi rotary, Bosch & Zexel V.E., Bosch P type, all makes of common rail injectors & pumps.

Features and Specifications:

- No. of cylinders: 6
- Drive: AC Frequency / Electronic drive
- Main Motor: 7.5 HP / 5.5 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP



HT 800 E

- No. of cylinders: 8
- Drive: AC Frequency / Electronic drive
- Main Motor: 7.5 HP / 5.5 KW
- RPM: Variable from 0 – 5000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP



NMT 800 V

- No. of cylinders: 8
- Drive: Variator Drive
- Gear Box: Two speed hard & ground gears
- Main Motor: Dual speed 5 HP / 4 KW
- RPM: Variable from 0 – 6000 RPM
- Pressure Gauges: Digital and Analog
- Fuel Supply Motor: 1 HP



Dedicated Common Rail Test Benches



Mini CRDI 101 - Common Rail Injector, Pump & Rail Testing Bench

- This is the world's smallest Common Rail Test Bench
- 5 HP main motor with AC frequency drive
- The Machine is mounted on a rigid base with moveable trolley with three large tool drawers
- Can simultaneously test two solenoid type injectors of Bosch, Delphi, Denso make and one injector of Siemens and Bosch (Piezo type)
- Tests all types of Common Rail pumps, DRV, Pressure sensors, & injector solenoids
- Indication of OHM values during testing of injector solenoids and all DRV's, displays on Simulator screen as well as on computer
- Flow Meter / Rotameter measures return flow of all common rail pumps in CC/min
- Can be operated both in manual & auto pressure mode
- Drain of test tubes is done electrically through the push buttons
- Exhaust System controls pollution, eliminates spray fumes which is a health hazard. Acrylic liftable enclosure (shielding)



Mini CRDI 786

- 3 HP main motor with AC frequency drive
- Can simultaneously test two solenoid type injectors of Bosch, Delphi, Denso make and one injector of Siemens and Bosch (Piezo type)
- Indication of OHM values during testing of injector solenoids
- Can be operated both in manual & auto pressure mode
- Drain of test tubes is done electrically through the push buttons
- Exhaust System controls pollution, eliminates spray fumes which is a health hazard. Acrylic liftable enclosure (shielding)



CRDI 786

- 7.5 HP main motor with AC frequency drive
- Can simultaneously test four solenoid / piezo type injectors of Bosch, Delphi, Denso & Siemens make
- Tests all types of Common Rail pumps, DRV, Pressure sensors, & injector solenoids
- Indication of OHM values during testing of injector solenoids and all DRV's, displays on Simulator screen as well as on computer
- Flow Meter / Rotameter measures return flow of all common rail pumps in CC/min
- Can be operated both in manual & auto pressure mode
- Drain of test tubes is done electrically through the push buttons
- Exhaust System controls pollution, eliminates spray fumes which is a health hazard. Acrylic liftable enclosure (shielding)



Common Rail & EDC Testing Kits & Simulators



CRT 7000 - Common Rail Injector, Pump & Rail Tester (with computer interface/software) (Euro IV & V Compliant)

- Can simultaneously test two solenoid type injectors of Bosch, Delphi, Denso make and one injector of Siemens and Bosch (Piezo type)
- Tests all types of Common Rail pumps, DRV, Pressure sensors, & injector solenoids
- Indication of OHM values during testing of injector solenoids and all DRV's, displays on Simulator screen as well as on computer

- Can be operated both in manual & auto pressure modes
- Can test up to 2000 bar pressure with overload protection
- User can vary the injector pulse width, frequency, test time & system pressure

CRTK 7000 - Common Rail Injector, Pump & Rail Test Bench Kit (with computer interface/software) (Euro IV & V Compliant)

- This kit is used for testing all types of common rail injectors, pumps & rails. It is compatible with all types of diesel pump test benches



- The kit comes complete with CRT 7000 simulator, Bosch CPI high pressure pump mounted on a multipurpose foundation with suitable coupling, Bosch fuel rail with pressure sensor & DRV mounted on a stand, all high pressure pipes, all electrical connectors for injectors, pumps & rail, special coupling & delivery adaptors etc.



EDC EURO III Electronic Diesel Control Pump Simulator (with computer interface/software)

- Used to test all kinds of EDC VE Pumps including Bosch VP 36, 37 etc. on all diesel FIP test benches
- Two modes of operation: Open loop & Closed loop
- Milli Volt supply range: 0- 5000mV
- Solenoid testing facility - Can test the 12V / 24V solenoids on EDC pumps
- Comes complete with electrical couplers suitable for most types of EDC pumps
- Displays temperature of pump digitally on screen through Temp sensor in EDC pumps



Combo CRI 4000 R & CRP 2100

Fitted in trolley with Computer interface & UPS, Can test Simultaneously four CRDI Injectors & Pump of all makes



Combo CRT 7000 & EDC 1100

Fitted in trolley with Computer interface & UPS, Can test Simultaneously two CRDI Injectors & Pump of all makes along with EDC



Common Rail & EDC Testing Kits & Simulators



CRI 4100 - Common Rail Injector Simulator (with computer interface/software)

- Can simultaneously test two solenoid type injectors of Bosch, Delphi, Denso make and one injector of Siemens and Bosch (Piezo type)
- Indication of OHM values during testing of injector solenoids. Displays on Simulator screen as well as on computer
- User can vary the injector pulse width, frequency & test time



CRIT 4100 - Common Rail Injector Test Bench Kit (with computer interface/software)

- This kit is used for testing all types of common rail injectors. It is compatible with all types of diesel pump test benches
- The kit comes complete with CRI 4100 simulator, Bosch CPI high pressure pump mounted on a multipurpose foundation with suitable coupling, mechanical fuel rail fitted with high pressure gauge & drain control valve with wheel mounted on a stand, all high pressure pipes, all electrical connectors for injectors & delivery adaptors etc.



CRIH 4100 - Common Rail Injector Testing Hand Operated Kit

- This kit is used for testing all types of common rail injectors.
- The kit comes complete with CRI 4100 simulator, diesel injector nozzle tester with 600 bar gauge, all high pressure pipes, all electrical connectors for injectors & delivery adaptors etc.
- This kit can be used for quick testing of common rail injectors up to 500 bar pressure



CRI 4000 R - Common Rail Injector Simulator (with computer interface/software)

- Can simultaneously test four solenoid / piezo type injectors of Bosch, Delphi, Denso & Siemens make
- User can vary the injector pulse width, frequency & test time
- Can also measure injector response time



CRP 2100 - Common Rail Pump & Rail Simulator (with computer interface/software)

- Tests all types of Common Rail pumps, DRV, Pressure sensors, & Fuel rails
- Indication of OHM values during testing of all DRV's, displays on Simulator screen as well as on computer
- Can be operated both in manual & auto pressure modes
- User can vary the system pressure from 0 - 2000 bar



Cummins PT Pump & Injector Testing Equipment ●●●●



AG Precision 777: Cummins PT Pump Test Stand

- RPM: 0 - 5000, DRIVE: AC Frequency
- Tacho: Digital 0 - 9999 with stroke counter
- Main Motor: 5 HP / 4kw, 3Ph, 50 hz
- Flow Meter: Continuous reading ranges from 200 - 2000lbs./hr, Flow Meter: Throttle Leakage from 25 cc - 250 cc/min
- PR. Gauges & Vaccum Gauges: Manifold: 0-300 lbs/in², Air Pr. Gauge 0 - 60 lbs/in², Vaccum Gauge: 0 - 760 in/hg, Gear Pump Pressure Gauge: 0 - 600 lbs/in²
- Temp. Heating with Digital Temp. controller 0 - 199 deg. cent. which can be pre set at desired temp(optional)
- Std. Accessories with appropriate Hoses, splined coupling, star coupling are provided with Test stand



Cummins Injector Comparator - AG Precision 555

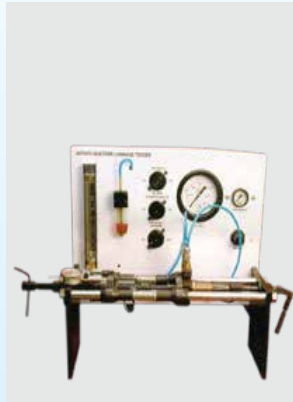
- Main Motor: 2 HP, 415V, 3ph, 50 hz; Fuel pump motor: 1 HP
- Cambox: 5 cams rapid changing for KT, NT, STC & Big cam & more
- Filtration: Triple, Injector clamping: By hydraulic (no air is required)
- Cambox driven by AC frequency variable speed drive (0 - 3000 RPM)
- Tachometer: Digital display of RPM (0 - 9999) with stroke counting
- Push button solenoid operated drain. Direct read out with accurate metering in burette (0 - 150cc)
- Console: Fuel pump Pr. Gauge 0 - 300 PSI, Injector Clamp: 0 - 300 PSI
- Temp: Heating with Digital Temp. controller 0 - 199 deg. cent. which can be pre set at desired temp (optional)
- Std. Accessories: All the necessary hoses & links, pots suitable to connect Flanged & cylindrical injectors



AG Precision 222
P.T. Pump Mobile Test Unit



AG Precision 444
STC Injector Top Stop Setting Fixture - Used for setting the Plunger & Total Travel



AG Precision 333
Injector Leakage Tester- Used for Plunger Seat, Plunger Barrel & Ball Leak Test



Cummins Injector Assembly/Dismantling fixture



Diesel Injector Nozzle Pop Testers & More..



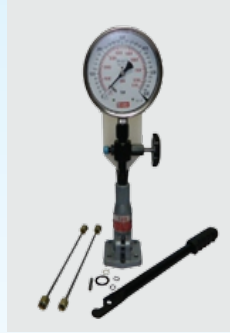
NTD 400

Heavy duty, 100 mm dial dual scale pressure gauge, range 0 - 400 bar/PSI. Casted aluminium body with semi transparent oil container with 5 micron filter, handle & pipes



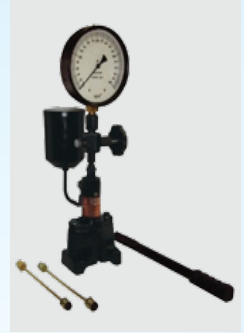
NTG 400

Heavy duty, 150 mm glycerin filled, SS body, dual scale pressure gauge, range 0 - 400 bar/PSI. Die Casted aluminium body with fully transparent oil container with 5 micron filter, handle & pipes



NTD 600

Heavy duty, 150 mm dial, SS body, dual scale pressure gauge, range 0 - 600 bar/PSI. Casted aluminium body with semi transparent oil container with 5 micron filter, handle & pipes



NMT 400

Heavy duty, 150 mm dial pressure gauge range 0 - 400 bar. Cast iron pump mounted on rigid aluminium base with sheet metal oil container with 5 micron filter, handle & pipes



AGP 60 H

Heavy duty, 100 mm glycerin filled, SS body, dual scale pressure gauge, range 0 - 400 bar/PSI. Hard Plastic moulded body with fully transparent oil container with 5 micron filter, handle & pipes



Ultrasonic Cleaners with Digital timer & Heater

- Available in 2, 2.5, 4.5 Ltr. capacities & both in plastic & SS bodies
- Works on high frequency providing excellent cleaning results



Spray Chamber with exhaust motor

The spray chamber is enclosed by a imported, unbreakable acrylic glass hinged window which enables clear view of all spray formations. The hand operated test pump (Nozzle Tester) can be mounted rigidly on the base. It eliminates harmful unwanted spray fumes from the workshop



Pressurised Dual Washing Tank

Consisting of 2 washing tanks 1 is for pre wash & 2nd is for final wash, which has a pressure gun, operated by high pressure pump driven by 1 HP motor & control valve



Common Rail Tools & Accessories



Common rail tools kit



Common rail injector puller tools



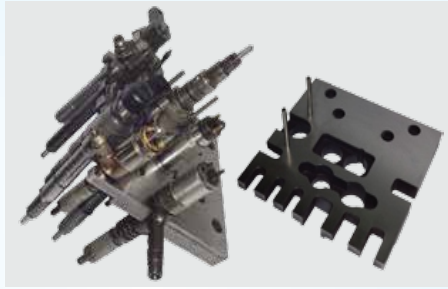
High pressure gauges,
Ranges: 2000 & 3000 bar



Tool to measure
valve ball lift



Common rail injector pods / adapters



Common rail injector fixture

Diesel Test Bench Tools & Accessories



Ball vice for
inline & rotary
pumps



Swiveling vice
for inline &
rotary pumps



Various types of pump
mountings / foundations



Calibrating tools for various
diesel pumps



Master injector kits for
VE, Delphi DPC, Inline
and EDC pumps



Flexible
couplings - 8
cylinder and 12
cylinder



Cam Box for EUI & EUP
with Simulator



Test tubes sets - 260,
44, 75, 16 ml sets



Test bench cone
couplings set-
A,B,C,D,E type



Timer travel / auto
advance gauges



Digital tachometer
with stroke counter &
timer



Launch X431 Pro Scanner ●●●●

Launch X431 Pro is a multipurpose scanner capable of scanning all types of cars in the world market with 50 plus brand softwares.



- Read and clear trouble/fault codes
- Supports data streaming and acutation test, ECM programming, Injector coding, Immobilizer coding and many more features
- It has bluetooth connectivity, User can scan the vehicle from up to 10 meters away
- Free software updates through wi- fi connectivity
- All features of a tablet such as an ipad (Android)

Standard Accessories (Provided free of cost with all our 8 / 12 cylinder test benches)

1. Bracket for flange mounted inline VE / Rotary pumps
2. Quick Action clamp for base mounted inline pumps
3. Set of 6 / 8 / 12 Master Test Injectors for Inline pumps
4. Set of 6 / 8 / 12 High pressure pipes (M14 / M12 Nuts) + Set of 6 / 8 / 12 A to B converter adapters
5. Two setting Blocks for A and B types for inline pumps
6. Set of graduated glass test tubes / Burettes (Borosil) 75cc / 16cc or 44cc / 260cc
7. Two perforated trays for keeping tools, One Phasing Bar and One Machine Lamp
8. One Backlash free flexible coupling
9. Digital Temperature Indicator
10. Manifold pressure compensator (M.P.C.) for testing leakage and functional tests of diaphragm fitted in pumps of turbo powered engines
11. D.C. Power source 12 V / 24 V for testing solenoid switches
12. Flow meter to measure the return of Rotary and Distributor pumps
13. Allen key set

Extra standard accessories provided with our Multipurpose / Common rail test benches

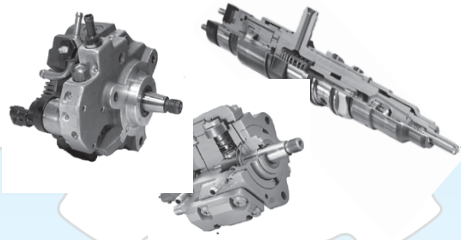
- a. Common rail injector adapter / Pod for Bosch Cummins injectors
- b. 7 mm and 9 mm CR nozzle delivery and return adapters
- c. Set of high pressure pipes for common rail application
- d. EDC pump triangular socket tool

Special Accessories (These can be bought separately along with all our test benches)

1. Master injector set of 6 for VE / Rotary pumps Set at 175 bar
2. Master injector set of 6 for Delphi / Lucas DPC Rotary pumps Set at 127 bar + 3 bar
3. Ultrasonic cleaner for cleaning injector parts / nozzles
4. Diesel injector nozzle pop tester for testing traditional / non common rail diesel injectors
5. Universal ball vice with mounting plate for diesel pumps including common rail
6. Important tools kit for traditional VE and Delphi / Lucas rotary pumps
7. Driving attachment for Delphi Rotary DPC pumps (Bearing type with adjustable height)
8. Attachment and coupling for AMW and Bosch P type pumps (Special)
9. Timer Travel gauge for Bosch VE Pumps
10. Auto Advance Gauge for Delphi / Lucas DPC rotary pumps
11. Heating with digital electronic temperature controller with automatic cut-off set at 40 +/- 5 C
12. Cam Box for single cylinder pumps
13. Feed pump tester with 1000 CC jar, pressure gauge and drain valve to measure the back leakage of Feed / rotary pumps
14. Common rail tools kit
15. Common rail injector holding fixture
16. Common rail injector puller tool
17. Chiller / cooling system for test bench
18. Low inertia master injectors for 'P' type pumps



Estd. 1975



IMPORTANT INFORMATION

- Standard voltage for our test benches is 415 / 440 V, 3 Phase, 50 hz. Special voltages like 220 V, single phase OR 220 V, 3 phase can be provided at request
- We can also make customized test benches tailored to your specific requirements
- Higher horse power motors can be offered on request for all test benches
- Due to continuous R & D and technological upgrades the design and dimensions may change without prior notice
- Accessories shown in pictures may not be part of standard accessories
- Color Options: Green with black trim or Blue with white trim
- Prices, Net Weight, Gross weight & Dimensions on request
- Domestic Warranty: 12 months from the date of supply
- International Warranty: 18 months from the date of shipment
- Extended warranties can be provided
- Training: Training will be provided free of cost along with the purchase of our test benches at one of our manufacturing facilities in New Delhi (India)

"While manufacturing, we are observing & meeting - ISO 4008 specifications"



INDIAN MACHINE TOOLS

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