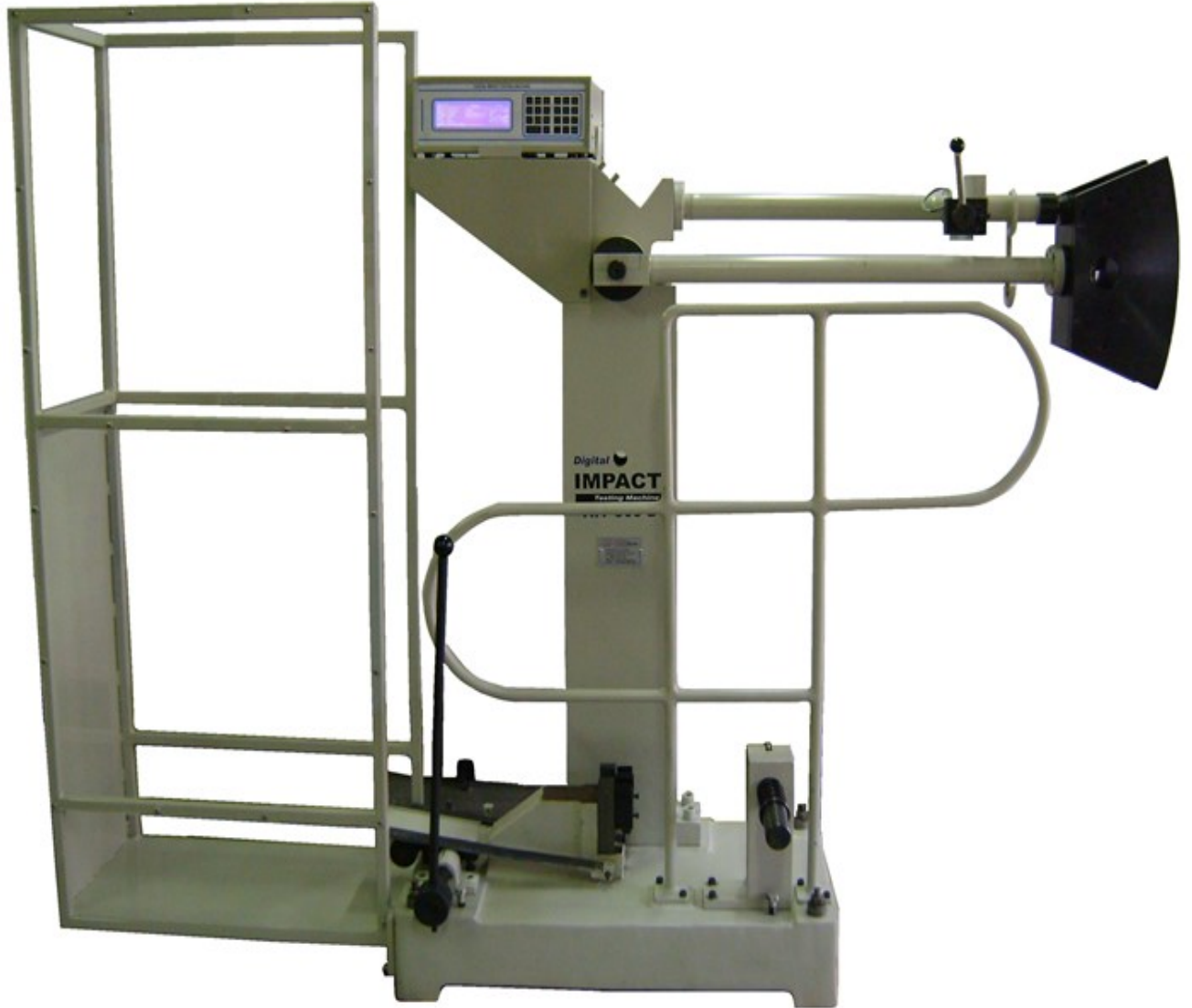


**AIT 300-D**  
**DIGITAL PENDULUM IMPACT TESTING**  
**MACHINE**



**BMS Bulut Makina Sanayi ve Ticaret Ltd. Şti.**

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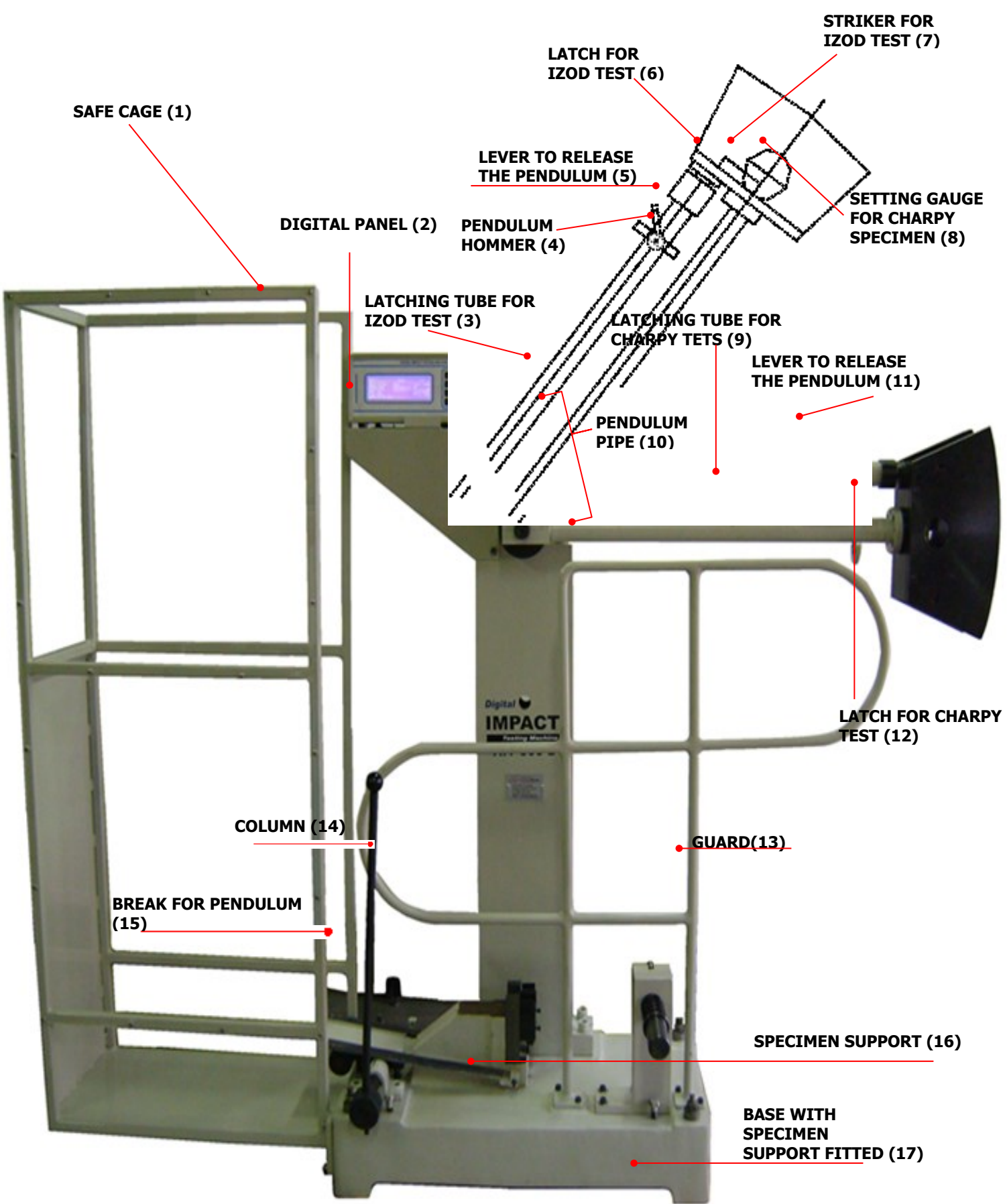
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# 1 TECHNICAL SPECIFICATIONS

OBJECT	CHARPY TEST	IZOD TEST
<b>1.1 Pendulum</b>		
a. Maximum Impact Energy	300 J	170 J
b. Angle of Drop	140°	90°
c. Effective Weight of Pendulum	21.3 kg	21.3 kg
d. Resolution	0.3 J	0.3 J
e. Striking Velocity	5.308 m / sec	3.994 m / sec
f. Permissible Total Friction loss	0.50%	0.50%
g. Distance From axis of rotation of Pendulum to center of specimen for Charpy and up to striking edge for Izod	813.5 m m	813.5 m m
h. Distance between physical percussion centre and center of specimen for Charpy	± 8.135 m m	-
i. Distance between physical percussion center and striking edge for Izod	-	± 8.135 m m
<b>1.2 Support for Charpy</b>		
a. Distance between support	- 0.0 40mm +0.5	-
b. Angle of test piece support	78° to 80°	-
c. Radius of supports	1 to 1.5 m m	-
OBJECT	CHARPY TEST	IZOD TEST
<b>1.3 Charpy Striker</b>		
a. Angle of striking edge	30° ± 1° mm	-
b. Radius of striking edge	2 to 2.5 mm	
<b>1.4 Support for Izod</b>		
a. Width of specimen clamping groove	-	10 mm +0.15 - 0.25
b. Distance between support top & striking edge	-	22 mm ± 0.5
<b>1.5 Izod Striker</b>		
a. Angle of striking edge	-	75° ± 1°
b. Radius at the edge	-	0.5 m m to 1 m m
c. Angle between the normal to the specimen and the underside face of the striker at the striking point	-	100° ± 1°



**SAFE CAGE (1)**

**DIGITAL PANEL (2)**

**LATCHING TUBE FOR IZOD TEST (3)**

**COLUMN (14)**

**BREAK FOR PENDULUM (15)**

**LATCH FOR IZOD TEST (6)**

**LEVER TO RELEASE THE PENDULUM (5)**

**PENDULUM HOMMER (4)**

**LATCHING TUBE FOR CHARPY TETS (9)**

**PENDULUM PIPE (10)**

**STRIKER FOR IZOD TEST (7)**

**SETTING GAUGE FOR CHARPY SPECIMEN (8)**

**LEVER TO RELEASE THE PENDULUM (11)**

**LATCH FOR CHARPY TEST (12)**

**GUARD (13)**

**SPECIMEN SUPPORT (16)**

**BASE WITH SPECIMEN SUPPORT FITTED (17)**

## **2 APPLICABILITY**

Digital Pendulum Impact Testing Machine **AIT 300 –D** serves for conducting Charpy and Izod Impact Tests according to **BS – 131 part 2 & 3**. The machine calibration conforms to **BS EN 10045 Part II, – 1993** for Charpy & **BS 131 part 4 1993** for Izod. The Impact tests enable to determine the behavior of metals under impact loading conditions, give the proof of susceptibility to brittle fracture and also enable the supervision of heat treatment process. The proof of brittle fractures permits conclusions on cold brittleness, hot brittleness, ageing or other prejudices of material.

During Charpy test, the specimen rests freely on two supports. The notch at which the specimen breaks, lies at the center of percussion of the striker. The impact strength of the specimen is equal to the impact energy absorbed by the specimen before rupture divided by the original cross sectional area of the specimen at the notch. The Digital Panel is calibrated so as to indicate the energy absorbed by the specimen directly in Joules.

## **3 INSTALLATION AND COMMISSIONING**

### **3.1 FOUNDATION**

The R. C. C. Foundation should be kept ready as per sketch .The depth of the foundation is to be decided by the customer depending upon the soil conditions.

### **3.2 UNPACKING**

Open the wooden packing case. Remove the grease applied to the various parts and clean carefully by kerosene. Instruction Book, hammer latching tube for Izod and Charpy test and other standard accessories are also packed loose in the same box.

### **3.3 INSTALLATION**

Keep the machine on the concrete foundation and insert the foundation bolts. Level the machine roughly by using taper wedges. Use the reference surface provided on the machine. Grout the foundation bolts and allow sufficient curing period. Assemble the pendulum hammer pipe on the center shaft. Locating pin is provided for correct location. Fix the digital panel on the top rear side of column on bracket. The latching tube along with the latching mechanism is common for Charpy and Izod tests.

Assemble the latching tube on the Bearing Bracket for the Charpy or Izod test according to the respective angles (i. e. 140° for Charpy and 90° for Izod). The four screws are provided for the same and the locating pins are fixed on the machine (in the factory itself)

Fix up the Charpy Izod anvil block to the machine. Fix up the Izod striker to the Pendulum hammer pipe clamp the Izod test specimen in the block. Fix up the 4 numbers of leveling screws to the machine base. Insert suitable steel plate 5 mm thick below the leveling screws. Level the machine base, i. e. 'A' by using the leveling screws. The levelling along the plane of Pendulum swing is to be adjusted in such a way that when the Pendulum is having vertically in its free condition the striker should just touch the Izod specimen. Use light source to ensure just touching. Insert taper wedges and packing all around the machine base. Unscrew the levelling screw and tighten the foundation bolts. Check the levels again and rectify if required.

## **4 MACHINE DESCRIPTION**

The Pendulum Impact Testing Machine mainly consists of the base, column and the Pendulum mounted in bearings. The column is bolted to the base .The Bearing bracket is bolted on the column at the top. The Centre shaft is mounted in the two bearing brackets with antifriction bearings. The Pendulum is fixed to the Centre shaft .The Pendulum consists of Pendulum pipe and the side plates the suitable striker (Charpy or Izod) is to be fixed to the Pendulum as per the test to be conducted. The guard is provided to protect from the Pendulum swing partially.

The release mechanism for Charpy as well as Izod is common. The latching tube along with release mechanism is mounted on bearing bracket in their respective locating pins either for Charpy test or Izod test. The latch at the end of latch tube is operated by a handle mounted on the tube itself.

The Digital Panel is fixed on the Top rear side of column on Bracket. The Digital Panel indicates energy (in Joules) absorbed by the specimen after rupture & strength in J/sq.cm.

The braking arrangement for stopping the Pendulum swing after rupture, consists of the braking strip having a leather lining at the top. The Brake is operated by the Brake Rod

1	SAFE CAGE	10	PENDULUM PIPE
2	DIGITAL PANEL	11	LEVER TO RELEASE THE PENDULUM
3	LATCHING TUBE FOR IZOD TEST	12	LATCH FOR CHARPY
4	PENDULUM HOMMER	13	GUARD
5	LEVER TO RELEASE THE PENDULUM	14	COLUMN
6	LATCH FOR IZOD TEST	15	BREAK FOR PENDULUM
7	STRIKER FOR IZOD TEST	16	SPECIMEN SUPPART
8	SETTING GAUGE FOR CHARPY SPECIMEN	17	BASE WITH SPECIMEN SUPPORT FITTED
9	LATCHING TUBE FOR CHARPY TEST		

## 5 TEST PROCEDURE

### 5.1 CHARPY IMPACT TEST

Fix up the Charpy Izod Anvil block and the Charpy striker in their respective positions. Place the Charpy test specimen on the supports. Align the centre of specimen notch w. r. t. centre of support by means of Charpy setting gauge. Touch the striker to the test specimen. Lift the Pendulum by hand till it gets latched in position & Press cycle start key once. For releasing the Pendulum operate release handle lever successively. Allow the Pendulum swing freely and break the specimen. After rupture, stop the Pendulum slowly by operating Brake Rod. Read the absorbed energy & strength directly on the Panel.

Before proceeding for next test remove the broken pieces of the test piece and latch the hammer in its position & repeat above procedure. (Also refer Description of operation for Digital Panel)

### 5.2 IZOD IMPACT TEST

Fix up the Izod Striker. Mount the latching tube of Izod Test on the Bearing bracket. Loosen the Clamping screw of the support and insert the test specimen. Align the centre line of the notch in the planes of support top, by using the Setting gauge and clamp the specimen by Clamping screw. Touch the striker to the test specimen. Lift the Pendulum by hand till it gets latched in position & then press cycle stark key once & for releasing the Pendulum operate Release Handle Lever. The further steps may be followed as given in to obtain the energy absorbed by the test specimen. For removing the broken specimen, hold the specimen by hand and remove the same after loosening the clamping screw.

## 6 DESCRIPTION OF OPERATION FOR DIGITAL PANEL

When Power is made 'ON' for digital panel of the AIT-300 D M/c.

It will always display

Test	Mode	Key
Specimen Size	Test	Cycle Start
Unit	Cal	Cal

Upper	Data entry	Sp.Size, Avg,
Limit, Date, Sr.No,		
Lower		Unit
Avg.		
Sr. No		
Date		

The further communication between the operator and the digital panel is through the key board and the display system



## 6.1 Different keys & their Functions

### 6.1.1.) Sp.Size

This key is used to select the specimen size for Izod & Charpy test (use 1 to 5 + Enter to Exit)

### 6.1.2.) Limit

This key is used to enter the Higher Limit value and Lower Limit value. You can enter the Limit values from 0-9999.9. When you press the Limit Key the display will show the Lower Limit value first & after pressing Enter Key the display will show Higher Limit value.

### 6.1.3.) Date

Using this key you can enter Day, Month & Year.

### 6.1.4.) Avg.

This key is used to select the Avg. of No of readings. You can select the Avg. No from (Range 0-99)

### 6.1.5.) Serial number Key

Using this key, you can enter the Sr.no. for the Specimen to be checked (Range 0-9999) Use 0-9+ Enter Key

### 6.1.6.) Cal

This key is used for checking calibration of the machine.

### 6.1.7.) Print Key

This key is used to take printouts of the data & results of a specimen tested.

### 6.1.8.) Cycle Start

This Key is used when we have to test the Specimen for Izod or Charpy test.

### 6.1.9.) Unit

Using this key you can select the Units is Joules or Joules/sq. cm or kg. fm or kg fm/sq. cm

### 6.1.10.) For Conducting Izod & Charpy Test

Latch hammer & press cycle start key once & release hammer gently. After completion of the test, Test results will be displayed as Energy = Joules strength =J/sq. cm for next test repeat the same procedure.

### Various specimen sizes.

#### I) Izod test

- 1) 10 X 10 mm V Notch
- 2) Dia = 11.4 mm V Notch

#### II) Charpy Test

- 1) 10 x 10 mm V Notch
- 2) 10 x 10 mm U Notch
- 3) 10 x 5 mm V Notch
- 4) 10 x 7.5 mm V Notch
- 5) 10 x 2.5 mm V Notch

(use 1 to 5 + Enter to Exit)

## 7 LIST OF ACCESSORIES

#### I) Standard Accessories supplied with the machine

- |                                                    |       |
|----------------------------------------------------|-------|
| 1) Striker for Charpy test                         | 1 No. |
| 2) Support block for Charpy and Izod test specimen | 1 No. |
| 3) Striker for Izod Test                           | 1 No. |
| 4) Setting gauge for Charpy Specimen               | 1 No. |
| 5) Setting gauge for Izod Specimen                 | 1 No. |
| 6) Clamping piece for striker                      | 1 No. |

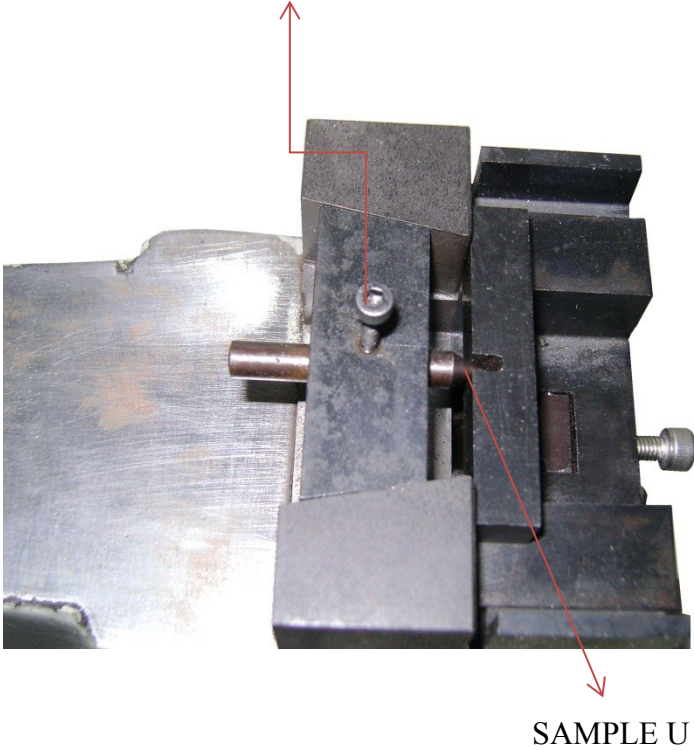
#### II) Additional Accessories which can be supplied at extra cost.

- 1) Specimen setting and centering tong for Charpy test (Useful particularly for carrying out tests of at subzero temperatures)
- 2) Gauges for checking distance of specimen notch center from both the ends Izod and Charpy test specimens (One gauge for Charpy and one gauge for Izod specimen)
- 3) Special clamps for round Izod specimen.
- 4) Gauges for checking the standard U notch on Charpy specimen
- 5) Gauges for checking the standard V notch on specimen.
- 6) Gauge for checking the depth below the standard U notch on specimen
- 7) Gauge for checking depth below the standard V notch on specimen.
- 8) Milling cutter for cutting U notch on specimen.
- 9) Milling cutter for cutting V notch on specimen.
- 10) Special charpy support with end stop for specimen. Any other specific requirement can also be fulfilled on Request.
- 11) Support for Impact Tension test.
- 12) Striking fork for impact tension test.



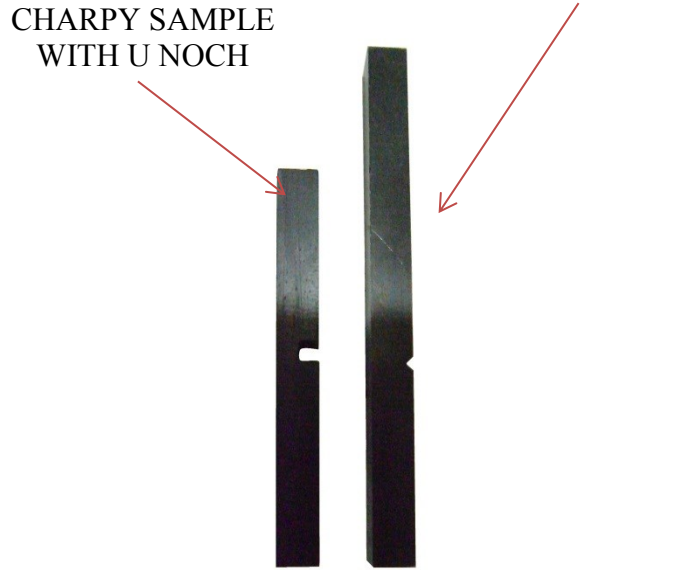
# 8 TO SET TO POSITIONS OF CHARPY & IZOD SAMPLES

LOCATING APPARATUS FOR CHARPY SAMPLE

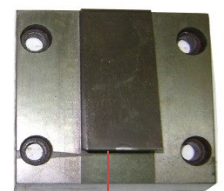
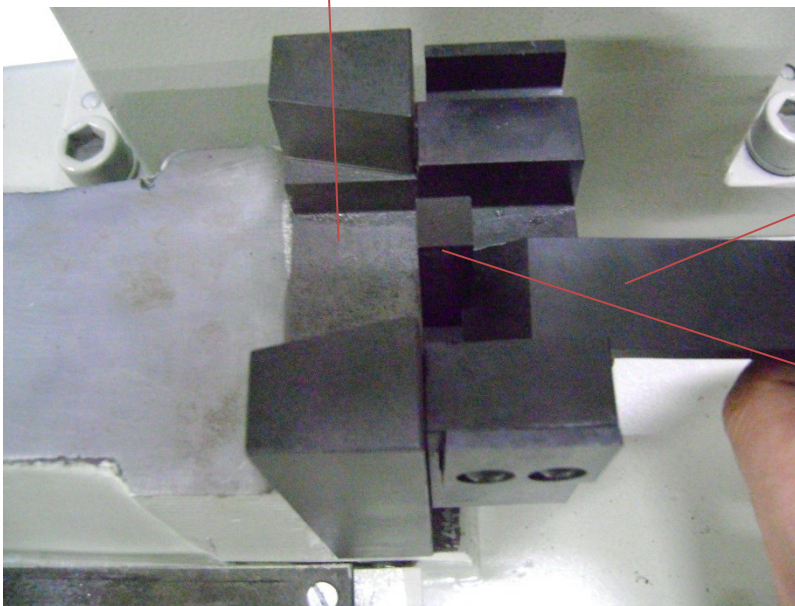


CHARPY SAMPLE WITH U NOCH

IZOD SAMPLE WITH V- NOCH



LOCATING APPARATUS FOR IZOD SAMPLE



CHARPY IMPACT KNIFE

IZOD IMPACT KNIFE

ADJUSTMENT APPARATUS FOR POSITIONING OF IZOD TEST

IZOD SAMPLE WITH V-NOCH