'R'
FOR
RETURN

12 M8X1.0

'Z'

'S'
FOR
SUCTION

M12X1.5

M14X1.5

5

DUST CAP

5

55.0 (FULL LEVEL)

3

ASSEMBLY FUEL TANK
FOR REFERENCE

2

5

6

5

11

7

4

SECTION A-A

Ø5.0±0.5

A — A

NOTCH (2NOS.)
FOR CRIMPING PLUG
IN RETURN TUBE
AT OPPOSITE SIDE OF
HOLE

MOUNTING HEIGHT
505.5±0.5

486.0±2.0

225.5±5

PLUG

2

TATA GROUP COMPOSITE MARK
(REFERENCE STANDARD TS11234 & TS10806)

2

QR CODE STICKER
SEE FIG. 1 FOR DETAILS

'X'

3

2

TATA

Veethree

DAY/YEAR OF MFG.
TO BE STAMPED

8

EPOXY TO BE PROVIDED
(5NOS.)

10

Ø16.51 ±0.25

Ø11.80 ±0.1

Ø16.51 ±0.25

9

B

Ø12.61 ±0.1

26.62 ±0.5

(31.0)

50.6

13

15.0
EMPTY LEVEL

5.0±1.5

(2.0)

(8.5)

(19.0)

FUEL TANK BOTTOM
FOR REFERENCE

(FITTINGS DIM. AS PER SAE J2044)

VIEW FROM ARROW 'Z'

80.0

5.5

5.0

FILTER
MESH SIZE 250 X 140 MICRONS
AS PER IS:1568

'Y'

VIEW FROM ARROW 'Y'

4 PART NO. TABLE

S.NO.	SUCTION/RETURN PORT TYPE	DRAWING VIEW	IIL PART No.	CUSTOMER P/No.
1	FITTINGS	'A'	313206	5120 5430 4902 MOD_b
2	PLUGS	'B'	313226	5091 5430 4901 MOD_b

4 SUCTION/RETURN PORT TYPE VIEW 5

R S

VIEW 'A' (P/NO. 313206)

R S

17

16

VIEW 'B' (P/NO. 313226)

CLASSIFICATION OF CHARACTERISTICS

CRITICAL ——————— ●
MAJOR ——————— ◐
KEY INSTRUCTION ——————— ▲
MINOR ——————— NONE
LINE BELOW SYMBOL ● APPLIES TO UPPER LIMIT
LINE ABOVE SYMBOL ● APPLIES TO LOWER LIMIT
NO LINE WITH SYMBOLS APPLIES TO BOTH LIMIT

No.	MODIFICATIONS	ECN NO.	DATE	CHKD.	APPD.
7_2	CUSTOMER PART NO. 5091 5430 4901 MOD_b WAS 5091 5420 1603 MOD_b OF PART NO. 313226	DRN-XXX	29.3.22		
7_1	SEALING OF SENSOR HEAD : IP69K WAS IP67	DRN-XXX	17.3.22	Ajit	
7	QR CODE STICKER DETAIL UPDATED		25.2.22	Ajit	
6	NOTE NO. 8 OF LOCTITE SI 5910 ADDED		27.1.22	Ajit	
5	VIEWS UPDATED AS PER AFT (PHASE-1) DESIGN, CONNECTOR MATERIAL CHANGED FROM NYLON TO PBT, IP67 WAS IP66 & DUST CAP VIEW ADDED		20.9.21	Ajit	
4	SUCTION/RETURN PORT TYPE DETAILS TABLE, VIEW ADDED, P/NO. 313226 ADDED & DRG. UPDATED	RM-267	3.3.21	Ajit	
3	SENSOR HEAD FINISH- BLACK PAINT - ELECTROPHORETIC DEPOSITION (EPD) DELETED		6.1.21	Ajit	
2	TATA LOGO, SECTION B-B, QR-CODE STICKER, NOTE NO. 4, 5 ADDED, CONNECTOR SEALING RING MATERIAL WAS EPDM, FLANGE SEALING RING MATERIAL WAS EPDM, O-RING CLOUR-BLACK WAS RED NOTE NO. 3,4 ADDED IN MECHANICAL SPECS, NOTES NO. 6 ADDED, EQUIVALENT WORD DELETED IN CONNECTOR DETAILS, BAYONET COVER MATERIAL WAS CRCA STEEL, IN BOM SR. 1 EPD FINISH ADDED, COVER MATERIAL— PBT WAS NYLON – 6, TS11879, TS10806, TS11234 ADDED & DRG. UPDATED		07.10.2020	Ajit	
1	FULL LEVEL 55.0 WAS 27.0 AND HEIGHT LEVEL IN CALIBRATION TABLE 450 WAS 478 AT FULL, 346 WAS 366.5 AT 3/4TH, 246 WAS 260 AT HALF, 146 WAS 153 AT 1/4TH, 94 WAS 98 AT EMPTY (HIGH)		3.1.2020	Ajit	

INDICATION
INSTRUMENTS LTD.
FARIDABAD (HARYANA)

CUSTOMER
TATA MOTORS LTD.

DRN.	Vinod	30.12.19
CHKD.	Ajit	
APPD	Hardeep	

TITLE
CAPACITIVE FUEL LEVEL SENDER
(INTEGRATED DESIGN), 225/350 LTRS
ROUND METAL TANK

SCALE NTS
DO NOT SCALE
THE DRAWING

ALL DIMENSIONS IN mm.

REF. DRG. No:-

DRG. No.
313206...
SHEET 1 OF 2

Mod.No.
7_2

SPECIFICATION:-

▲ 1. VEHICLE OPERATING SYSTEM VOLTAGE: 24V DC WITH -Ve GROUND

2. WARRANTY TERMS:- 3 YEARS/3,00,000 Kms. WHICHEVER IS EARLIER.

3. MECHANICAL:-

▲ 3.1 SENSOR HEAD OF FUEL SENSOR ARE SUITED FOR MOUNTING OF FUEL TANK WITH Ø50.5mm HOLE (AS PER VIEW 'C')

③ ▲ 3.2 FITMENT OF FUEL SENDER :-BAYONET TYPE WITH 'O' RING

USE PROPER TOOL FOR FITMENT OF FUEL SENDER IN FUEL TANK

INSTALLATION TORQUE :-VERTICAL FORCE ATLEAST 400N. MAINTAIN THE VERTICAL PRESS & ROTATE THE GAUGE 30° CLOCKWISE.

DO NOT USE MORE THAN 45Nm. THERE SHOULD BE NO LEAKAGE OF FUEL AFTER THE UNIT IS TIGHTENED

④ ▲ 3.3 SUCTION/RETURN FITTING/PLUG TORQUE: 20±5Nm

② ◑ 3.4 FILTER PULL OUT FORCE AFTER ASSEMBLY SHOULD NOT BE LESS THAN 8.0 kg-f

⑦₋①⑤② ◑ 3.5 SEALING OF SENSOR HEAD : IP69K

4. ELECTRICAL:-

4.1 FOR ELECTRICAL CONNECTION PLEASE REFER TABLE 'B'

▲ 4.2 OPERATING VOLTAGE : 9-32 VDC WITH 80V OVER VOLTAGE PROTECTION

▲ 4.3 SUPPLY CURRENT : 15 mA @ 12VDC

: 23 mA @ 24VDC

◑ 4.4 OUTPUT SIGNAL : 0.5 VDC (EMPTY) TO 5VDC (FULL)

◑ 4.5 RESOLUTION : 10mV

② ◑ 4.6 ACCURACY : ±2.0% @ 20°C (+68°F) IN DIESEL WITH DIELECTRIC CONSTANT VALUE OF 2.1 TO 2.3

◑ 4.7 SLEEP CURRENT : 10mA MAX.

5. ENVIRONMENTAL:-

▲ 5.1 OPERATING TEMPERATURE RANGE :- -40 TO +85 DEG. CELCIUS.

▲ 5.2 STORAGE TEMP. RANGE :- -40 TO +90 DEG. CELCIUS

◑ 5.3 ALL STEEL PARTS ARE TO BE ZINC PLATED & TRIVALENT YELLOW PASSIVATED

AS PER FeZn8 Cr III Y AS PER TS:10812

NOTES:-

◑ 1. O RING WILL BE PART OF SUPPLY.

◑ 2. TANK UNIT TO BE PASSED UNDER TML AGREED DVP

◑ 3. FUEL SENDER TO BE CALIBRATED AT ALL FUEL INDICATION LEVEL

② ▲ 4. THE FUEL SENDER IS SELF CALIBRATING, WHICH MEANS ITS ACCURACY STAYS WITHIN ±10% EVEN IF USED IN A DIFFERENT FUEL, AS LONG AS DIELECTRIC CONSTANT OF FUEL IS WITHIN 1.75 TO 3.0.

② ◑ 5. THE PCBA SHOULD HAVE CONFORMAL COATING

② ◑ 6. GUIDING STRIPS (01 NOS.) TO BE USED IN BOTH THE PROBES ASSEMBLY

7. DIMENSIONS WITHOUT TOLERANCE ARE FOR REFERENCE ONLY.

⑥ ▲ 8. LOCTITE SI 5910 SHOULD BE USED FOR SENSOR HEAD SEALING
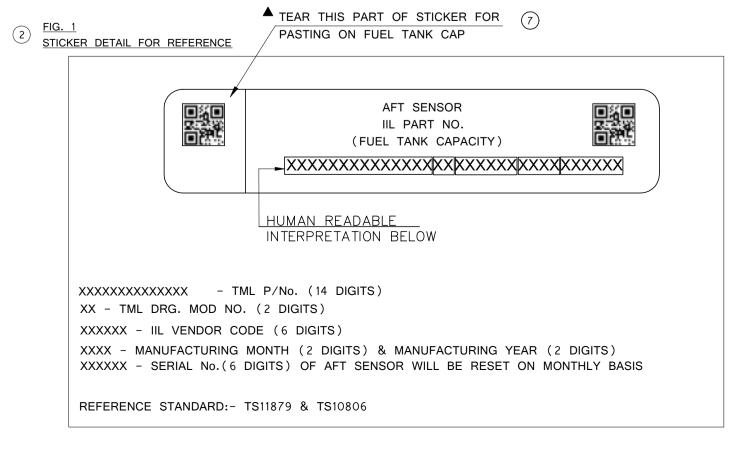
◑ **CALIBRATION TABLE: 'A'**

S.NO.	FUEL LEVEL	HIGHT FROM FUEL TANK BOTTOM (MM.) ①	OUTPUT VOLTAGE (V) (±2% OF FULL SPAN)	FUEL CAPACITY (L) (±1LTRS.)	
				225 LTRS	350 LTRS
1	FUEL	450	5.0	225	349.7
2	3/4	346	3.85	175.6	272.5
3	HALF	246	2.75	116.6	180.9
4	1/4	146	1.64	57.9	89.8
5	EMPTY (HIGH)	94	1.07	31	48
6	EMPTY (LOW)	42.5	0.5	9.8	15
7	DEAD VOLUME	27.5	0.5	5.1	8

▲ **TABLE: 'B'**

CONNECTOR CONFIGURATION	
PIN	TYPE
1	V+ (SUPPLY)
2	V- (GROUND)
3	SIGNAL OUT (0.5-5V)
4	------------

SUB ASSLY. SERVICABLE PART LIST

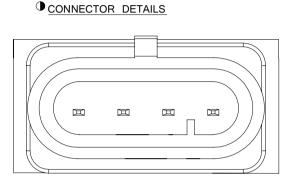| S.NO.	PRODUCT	QTY.	IIL PART No.	CUST. P/No.
1	O RING	01	ORN 40.002	5120 5430 78 01N
2	FILTER	01	PFC 40.001	5039 5430 36 01N
3	ENGINE SUCTION FITTING ASSLY.	01	SFA 40.001	5039 5430 68 01N
4	ENGINE RETURN FITTING ASSLY.	01	RFA 40.001	5039 5430 68 02N

② **FIG. 1**
STICKER DETAIL FOR REFERENCE

▲ TEAR THIS PART OF STICKER FOR PASTING ON FUEL TANK CAP ⑦

AFT SENSOR
IIL PART NO.
(FUEL TANK CAPACITY)

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

HUMAN READABLE
INTERPRETATION BELOW

XXXXXXXXXXXXX - TML P/No. (14 DIGITS)

XX - TML DRG. MOD NO. (2 DIGITS)

XXXXXX - IIL VENDOR CODE (6 DIGITS)

XXXX - MANUFACTURING MONTH (2 DIGITS) & MANUFACTURING YEAR (2 DIGITS)

XXXXXX - SERIAL No.(6 DIGITS) OF AFT SENSOR WILL BE RESET ON MONTHLY BASIS

REFERENCE STANDARD:- TS11879 & TS10806

BILL OF MATERIAL:-

S.NO.	PART NAME	QTY.	MATERIAL
1	SENSOR HEAD	01	ALUMINIUM ALLOY ADC-12 ③ ②
2	BAYONET COVER	01	STAINLESS STEEL AISI TYPE 304 ②
3	O-RING ID 55.0 X THICK. 6.4mm.	01	NITRILE HARDNESS SHORE 'A' 70 ±5 COLOUR-BLACK ②
4	CAPACITIVE TUBE (MAIN EXTRUSION)	01	ALUMINIUM 6060/6005 ② ⑤
5	SUCTION TUBE Ø10.0	01	COPPER COATED STEEL TUBE
6	RETURN TUBE Ø8.0	01	COPPER COATED STEEL TUBE
7	CONNECTOR	01	PBT, GF 30% ⑤
8	COVER	01	PBT, GF 30% ②
9	ENGINE SUCTION FITTING	01	FREE CUTTING STEEL HEX ROD
10	ENGINE RETURN FITTING	01	
11	AUXILIARY SUCTION TUBE Ø6.3	01	COPPER COATED STEEL TUBE ②
12	PLUG SUCTION/RETURN M8X1.0	02	FREE CUTTING BRASS
13	FILTER	01	NYLON - 6
② 14	CONNECTOR SEALING RING	01	NBR+PVC (70:30), COLOUR-BLACK
② 15	SENSOR HEAD SEALING RING	01	NBR COLOUR-BLACK
④ 16	ENGINE SUCTION PLUG M14X1.5	01	FREE CUTTING STEEL HEX ROD
17	ENGINE RETURN PLUG M12X1.5	01	

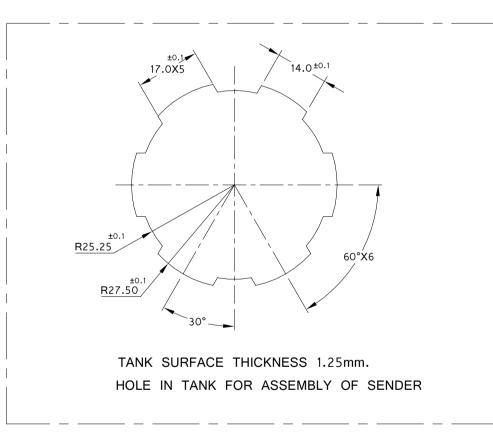**VIEW FROM ARROW 'X'**

◑ CONNECTOR DETAILS

TERMINATION: 4PIN CONNECTION

VIEW OF CONNECTOR SHOWN
FROM CONNECTOR MATING SIDE
TYPE: MOLDED CONNECTOR

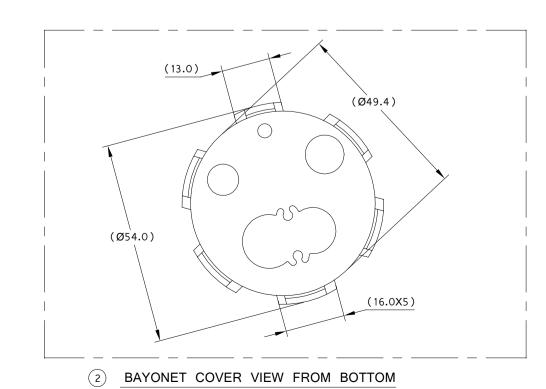HOUSING : 'AMP' Pt. NO.-282106-1

② TERMINAL BLADE (M): 'AMP' Pt. NO.-282109-1

MATING CONNECTOR HOUSING:'AMP' 282088-1

15

◉5.6 +0.2

② **SECTION B-B**

TANK SURFACE THICKNESS 1.25mm.
HOLE IN TANK FOR ASSEMBLY OF SENDER

▲ **FUEL TANK HOLE VIEW 'C'**

⑤ ② **ISOMETRIC VIEW P/NO. 313206**

⑤ ④ **ISOMETRIC VIEW P/NO. 313226**

② **BAYONET COVER VIEW FROM BOTTOM**
ONLY FOR REF.

No.	MODIFICATIONS	ECN NO.	DATE	CHKD.	APPD.
7₋2	CUSTOMER PART NO. 5091 5430 4901 MOD_b WAS 5091 5420 1603 MOD_b OF PART NO. 313226	DRN-325	29.3.22	Ajit	
7₋1	SEALING OF SENSOR HEAD : IP69K WAS IP67	DRN-325	17.3.22	Ajit	
7	QR CODE STICKER DETAIL UPDATED		25.2.22	Ajit	
6	NOTE NO. 8 OF LOCTITE SI 5910 ADDED.		27.1.22	Ajit	
5	VIEWS UPDATED AS PER AFT (PHASE-1) DESIGN, CONNECTOR MATERIAL CHANGED FROM NYLON TO PBT, IP67 WAS IP66 & DUST CAP VIEW ADDED		20.9.21	Ajit	
4	SUCTION/RETURN PORT TYPE DETAILS TABLE, VIEW ADDED, P/NO. 313226 ADDED & DRG. UPDATED	RM-267	3.3.21	Ajit	
3	SENSOR HEAD FINISH:- BLACK PAINT - ELECTROPHORETIC DEPOSITION (EPD) DELETED		6.1.21	Ajit	
2	TATA LOGO, SECTION B-B, QR-CODE STICKER, NOTE NO. 4, 5 ADDED, CONNECTOR SEALING RING MATERIAL WAS EPDM, FLANGE SEALING RING MATERIAL WAS EPDM, O-RING CIOUR-BLACK WAS RED NOTE NO. 3.4 ADDED IN MECHANICAL SPECS, NOTES NO. 6 ADDED, EQUIVALENT WORD DELETED IN CONNECTOR DETAILS, BAYONET COVER MATERIAL WAS CRCA STEEL, IN BOM SR. 1 EPD FINISH ADDED, COVER MATERIAL:- PBT WAS NYLON - 6, TS11879, TS10806, TS11234 ADDED & DRG. UPDATED		9.9.200	Ajit	
1	FULL LEVEL 55.0 WAS 27.0 AND HEIGHT LEVEL IN CALIBRATION TABLE 450 WAS 478 AT FULL, 346 WAS 366.5 AT 3/4TH, 246 WAS 260 AT HALF, 146 WAS 153 AT 1/4TH, 94 WAS 98 AT EMPTY (HIGH)		2.1.2020	Ajit	

INDICATION
INSTRUMENTS LTD.
FARIDABAD (HARYANA)

CUSTOMER

TATA MOTORS LTD.

DRN.	Vinod	30.12.19	USED IN
CHKD.	Ajit		
APPD	Hardeep		

SCALE NTS

DO NOT SCALE THE DRAWING

ALL DIMENSIONS IN mm.

REF. DRG. No:-

TITLE
CAPACITIVE FUEL LEVEL SENDER (INTEGRATED DESIGN), 225/350 LTRS ROUND METAL TANK

DRG. No.
313206...

Mod.No.
7₋2

SHEET 2 OF 2