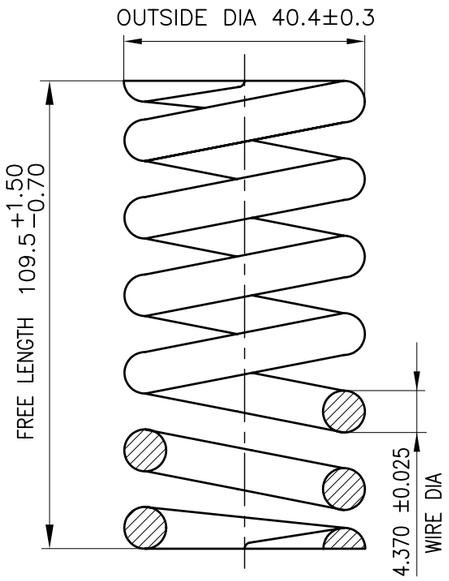
ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP.

DRAWING NO. 3-V-7506-10707



SPRING NO	0 – 170 MP
TOTAL COILS	15.5
DIRECTION OF WINDING	LH COILS
MAX. SOLID HEIGHT	67.6 mm
LOAD AT 77.8 mm SPRING LENGTH	24.0 kgs ±5%
LOAD AT 71.1 mm SPRING LENGTH	43.0 kgs ±5%
MATERIAL – COBALT ALLOY –MP35N(UNS30035)	
AFTER FORMING AGE AT 610/650°C FOR 4 HOURS	

NOTES:

1. APPROX. 1.25 CLOSED COILS AT ONE END
2. APPROX. 2 FULL PITCHES AT OPPOSITE END TO BE 9.5 mm
3. SPRING IS TO BE "HOT SET" PRIOR TO FINAL INSPECTION
4. HOT SET = 2 HOURS AT 530°C WHILST AT SOLID LENGTH FOLLOWED BY AIR COOL AND RELEASE

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
		96415259 OR 97462338				0.2			347

REV	DATE	ALTERED
		CHD & APPD

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TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI-620014.
365-121

	NAME	SIGN	DATE	NO.OF VAR.
DRN	K.P.LEON		04.01.92	
CHD	V.P.PILLAI		04.01.92	
APPD	K.NAGARAJAN		04.01.92	

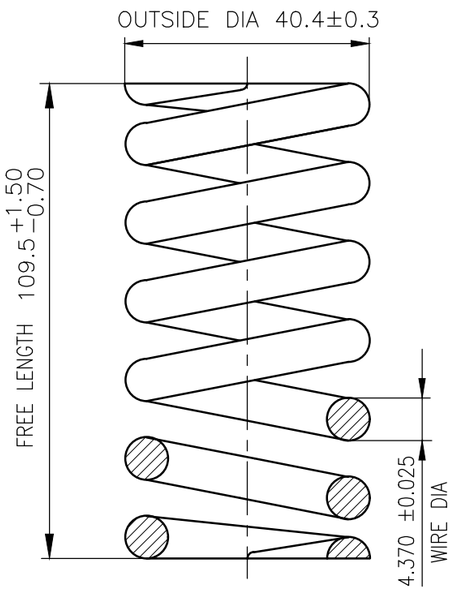
DEPT	GRADE OF UNTOLDIM	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
VL	C/M/F	NTS	0.21	DRESSER DRG.NO: SD CHART 405 DRESSER PART NO: 4-2.5/EZ159 HANSON REF: HSPRM 69	
CODE 340					

TITLE	CARD CODE	DRAWING NO.	REV
SPRING – MAIN	U 01	3-V-7506-10707	00

Size A3

ALL DIMENSIONS ARE IN MILLIMETRES. FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP / QP.

DRAWING NO. 3-V-7513-29671



SPRING NO	0 – 170 MP
TOTAL COILS	15.5
DIRECTION OF WINDING	LH COILS
MAX. SOLID HEIGHT	67.6 mm
LOAD AT 77.8 mm SPRING LENGTH	24.0 kgs ±5%
LOAD AT 71.1 mm SPRING LENGTH	43.0 kgs ±5%
WORKING TEMPERATURE	620°C
MATERIAL – INCONEL ALLOY 718 – UNS N07718	
AFTER FORMING AGE AT 650°C FOR 4 HOURS	

NOTES:

1. APPROX. 1.25 CLOSED COILS AT ONE END
2. APPROX. 2 FULL PITCHES AT OPPOSITE END TO BE 9.5 mm
3. SPRING IS TO BE "HOT SET" PRIOR TO FINAL INSPECTION
4. HOT SET = 2 HOURS AT 600°C WHILST AT SOLID LENGTH FOLLOWED BY AIR COOL AND RELEASE

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No
		974611720000				0.2			347

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI-620014.
365-121

	NAME	SIGN	DATE	NO.OF VAR.
DRN	J.DHANABAL		16.05.2020	–
CHD	R.RABIN		16.05.2020	
APPD	S.MADHULINGAM		16.05.2020	

DEPT	GRADE OF UNTOLDIM	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
VL	C/M/F	NTS	0.21	–	–
CODE 340					

TITLE	CARD CODE	DRAWING NO.	REV
SPRING – MAIN	U 01	3-V-7513-29671	00

REV	DATE	ALTERED
		CHD & APPD

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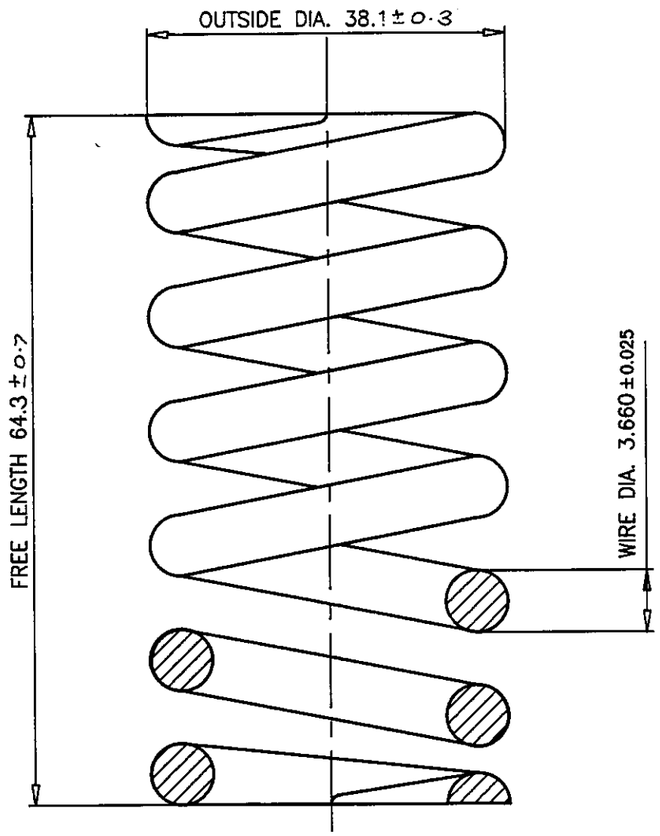
Size A3

ALL DIMENSIONS ARE IN MM



SPRING NO.	0 – 87 IX
TOTAL COILS	8.75
DIRECTION OF WINDING	LH COILS
MAX. SOLID HEIGHT	30.2mm
LOAD AT 58.7mm SPRING LENGTH	4.5kgs $^{+0}_{-5\%}$
LOAD AT 36.5mm SPRING LENGTH	22.6kgs $^{+0}_{-5\%}$
MATERIAL – INCONEL X750 –(AMS 5699)	
AFTER FORMING AGE AT 732°C FOR 16 HOURS	

NOTES:

1. APPROX. 1.0 CLOSED COILS AT ONE END
2. APPROX. 1.7 COILS AT OPPOSITE END TO BE 0.5 PITCH
3. SPRING ARE TO BE "HOT SET" PRIOR TO FINAL INSPECTION
4. HOT SET = 2 HOURS AT 500°C WHILST COMPRESSED TO 41.3mm LENGTH FOLLOWED BY AIR COOL AND RELEASE

SL No	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No

BHARAT HEAVY ELECTRICALS LTD.,
BOILER PLANT UNIT, TIRUCHIRAPALLI-620 014.

	NAME	SIGN	DATE
DRAWN	K.P.LEON		4.1.92
CHECKED	V.P.PILLAI		4-1-91
APPROVED	K.NAGARAJAN		

REV	DATE	ALTERED	CHECKED
02	4.1.92		

ZONE

UPDATED TO DRESSER ENGG.
REVISION EZ159

DEPT.	GRADE OF UNTOL DIM.	FIRST ANGLE	SCALE	WEIGHT (kg)
VL	C/M/F		N.T.S.	0.12
CODE 340				

DRESSER DRG No: SD CHART 404
DRESSER PART No: 2–4.2/EZ159
HANSON SPRINGS:

ITEM No.

TITLE: SPRING – MAIN

DRG No. 3–V–7504–10494

REVISION 02

OMAC CODE :

A3

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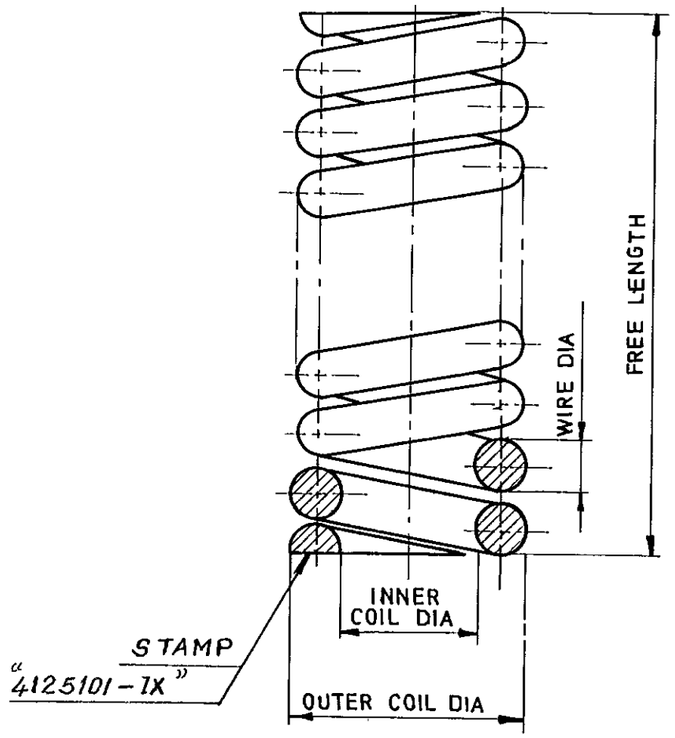
TP-DC-3-V-7520-10603
CORPORATE DRG ID

CLASS NUMBER	6-1525 VX
INSIDE DIAMETER	$51.820^{+0.800}_{0}$ mm
OUTSIDE DIAMETER	$67.690^{+0.800}_{0}$ mm
BAR DIAMETER	7.938 mm
FREE HEIGHT	177.800 ± 2.30 mm
SOLID HEIGHT (MAX)	92.96 mm
SOLID LOAD	150.113 Kgs
SOLID STRESS	45.967 Kg/mm²
TOTAL TRAVEL	99.10 mm
INITIAL DEFLECTION	39.700 mm
INITIAL LOAD AT 138.1 WORKING LENGTH OF SPRING	70.522 Kg
INITIAL STRESS	21.552 Kg/mm²
FINAL DEFELECTION	76.2 mm
FINAL LOAD 101.6 WORKING LENGTH OF SPRING	94.558 Kg
SOLID STRESS	45.967 Kg/mm²
AVERAGE LOAD RATE AT ROOM TEMP.	1.777 KgF/mm
WORKING TEMP. CONDITIONS	315.6 C°
TOTAL COILS	12.25
AVE. LOAD RATE AT 600°F	1.614 KgF/mm
MATERIAL	ASTM B637 UNS NO. N07750 (FORMERLY GR. 688) TY. 2
HEAT TREATMENT	NOTE-1
MATL. CODE	96415208/97462232



NOTE:-

1. SOLUTION TREATMENT AND PRECIPITATION HARDENING TREATMENT REQUIRED AFTER COILING.

NO. OF PIECES	DESCRIPTION	SEM PRO./SEQ.NO.	INT. MAT. / SEQ. NO.	FINAL MATERIAL	SCRAP SORT.	NET WT (kg)	GROSS (WT) kg	DRAWING NO.	ITEM NO

BHARAT HEAVY ELECTRICALS LTD.,
BOILER PLANT UNIT, TIRUCHIRAPALLI-14

FIRST ANGLE	SCALE			
	NTS	DRAWN	A.VELUSAMY	ITEM NO: 347
		CHECKED	V. Perumal Pillai	DR.DRG.NO.341251/EW 198
		APPROVED		PART NO.4125101/SL.NO.8996
ALL DIMENSIONS IN MILLIMETRES		DATE	9-1-89	WT. KGS : 1.10

TITLE

MAIN SPRING

DRAWING NO: 3_V_7520_10603

REVISION: 02

CAUTION

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33-116

REV	DATE	ALTD:		DATE	ALTERED:
02	17-8-99	CHD & APPD: V. Perumal Pillai	A	01.01.93	CHECKED:

MATL. CODE 97462232 ADDED.
DCN. NO. SV: 0586

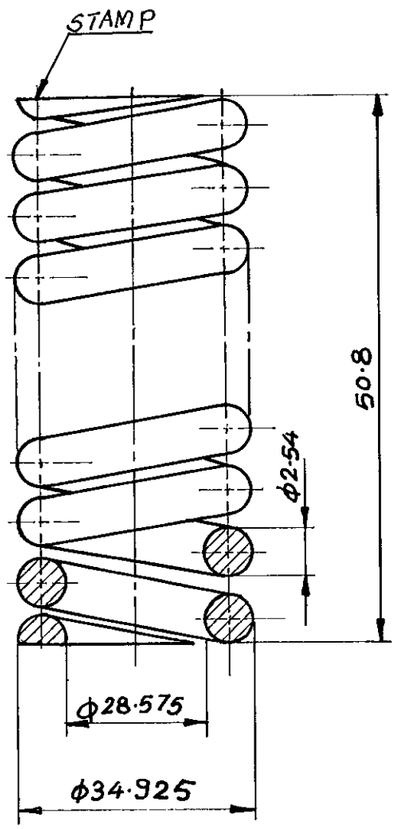
ZONE

OMAC CODE ADDED.

TP-DC-3-V-7520-10603
CORPORATE DRG ID

TP-DG-3-V-7520-10614
CORPORATE DRG ID

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP.



SPRING NO.	0-84-SY
FREE LENGTH	50·8 mm
NOMINAL RATE	0.2464 kg/mm
INSIDE DIA [FIXED]	28.575 mm
WIRE DIA	2.54 mm
OUTSIDE DIA [MAX]	34.925 mm
TOTAL DEFL	33.32 mm
INITIAL LOAD	1.225 kg
TEST DEFLECTION	23.32 mm
FINAL LOAD [MIN]	6.622 kg
FINAL LOAD [MAX]	7.347 kg
TILT DEFLECT	28.32 mm
MATERIAL CODE	96 415 209/97 462 311
MATERIAL	ASTM A 313 TYPE 316

NOTE:

1. SPRING SHALL BE SUPPLIED AS PER LATEST APPLICABLE QUALITY PROCEDURE

REV	DATE	ALTD:	01	DATE	ALTERED
02	17.8.99	CHD & APPD: V. Perumal Pillai		28.6.97	CHECKED & APPD: V. Perumal Pillai

MATL. CODE 97 462 311 ADDED
DCN. No. SV: 0586

NOTES UPDATED
DCN. No. SV: 0438

BHARAT HEAVY ELECTRICALS LTD.,
BOILER PLANT UNIT, TIRUCHIRAPALLI-14

FIRST ANGLE	SCALE	DRAWN	A. VELUSAMY	NET WT. (kg)	0.08
	NTS	CHECKED	V. Perumal Pillai	DR. DRG. NO.: SD 433	
		APPROVED		PART NO.: 0-84-SY/EU 769	
ALL DIMENSIONS IN MILLIMETRES		DATE	23-3-89	SL NO.: 8877	
				TITLE	ITEM NO.: 376

CAUTION
THE INFORMATION CONTAINED IN THIS DRAWING IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LTD., BOILER PLANT UNIT, TIRUCHY-14 AND SHALL NOT BE USED WITHOUT THEIR EXPRESS WRITTEN PERMISSION IN ANY FORM OR PART THEREOF FOR ANY OTHER PURPOSE THAN FOR WHICH IT IS SENT TO YOU.

33-115

SPRING - PILOT

DRAWING NO: 3-V-7520-10614

REVISION: 02

TP-DG-3-V-7520-10614
CORPORATE DRG ID

ALL DIMENSIONS ARE IN MILLIMETRES.

FOR TOLERANCES OF UNTOLERANCED DIMENSIONS DURING MANUFACTURE REFER RELEVANT QCP/QP

CORPORATE DRG ID:TP-DG-4-V-CV51-94041/00

REV	DATE	ALTERED CHD & APPD

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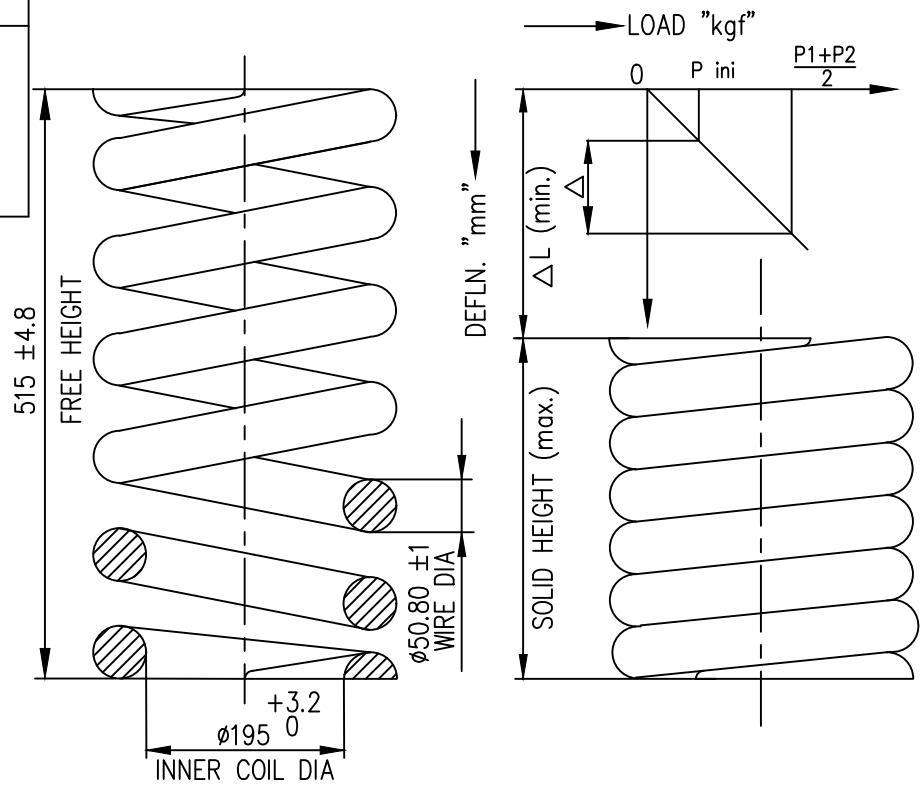


ROW	DESCRIPTION	UNITS	VALUE
01	MATL. CODE.	96 461 367 0000	
02	OUTSIDE DIA.MAX.LIMIT	(mm)	301
03	SPRING RATE ±4%	(Kg/mm)	80.00
04	SOLID DEFLECTION ΔL min.	(mm)	160
05	EFFECTIVE NO.OF COILS	NOS	5.30 $^{0}_{-0.5}$

ROW	DESCRIPTION	UNITS	VALUE
06	SPRING WEIGHT	(Kg)	90.0
07	PITCH	(mm)	83.24 ±2.0
08	PROCESS OF MANUFACTURE	HOT COILING	
09	IN-EFFECTIVE NO.OF COILS	SEE NOTE-7	

NOTES:

1. MANUFACTURE AND WORKMANSHIP SHALL IN ACCORDANCE WITH PROCEDURE APPLICABLE FOR NON-IBR SPRINGS.
2. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A564 - Gr.630 (or) 17-4 PH, HEAT TREATMENT CONDITION SHALL BE SUITABLY DECIDED BY THE VENDOR SUCH THAT STRESS AT SOLID CONDITION DOES NOT EXCEED ALLOWABLE STRESS OF THE MATERIAL.
3. FREE HEIGHT, SPRING RATE, SOLID DEFLECTION AND OUTSIDE DIAMETER ARE CRITICAL PARAMETERS AND SHOULD BE MAINTAINED.
4. THIS SPRING WILL BE CONTINUOUSLY IMMERSED IN WATER AT 200°C±10°C TEMPERATURE-VENDOR SHALL CONFIRM THE APPLICABILITY.
5. REFER TO LATEST REVISION OF TDC:5:082 AND APPLICABLE MATERIAL STANDARD FOR FURTHER DETAILS.
6. VENDOR SHALL SUBMIT A SPRING DESIGN CALCULATION SHEET ALONG WITH OFFER MEETING THE VALUES MENTIONED ABOVE.
7. END COILS OF THE SPRING SHALL BE CLOSED AND GROUND TO FLAT. NO. OFF IN-EFFECTIVE COILS SHALL BE SUITABLY DECIDED BY VENDOR.

NO OFF	DESCRIPTION	MATL CODE	MATL SPECN	HEAT TREATMENT	SCRAP SORT	NET WT (kg)	GROSS WT (kg)	DRAWING No	ITEM No

BHARAT HEAVY ELECTRICALS LTD.,
UNIT: HIGH PRESSURE BOILER PLANT.
TIRUCHIRAPALLI 620014.
365-122

	NAME	SIGN	DATE	NO.OF VAR
DRN	S.DAS	S.D	10.11.2018	
CHD	M.C.K	M.C.K	10.11.2018	
APPD	M.S.VINOD	M.S.V	10.11.2018	

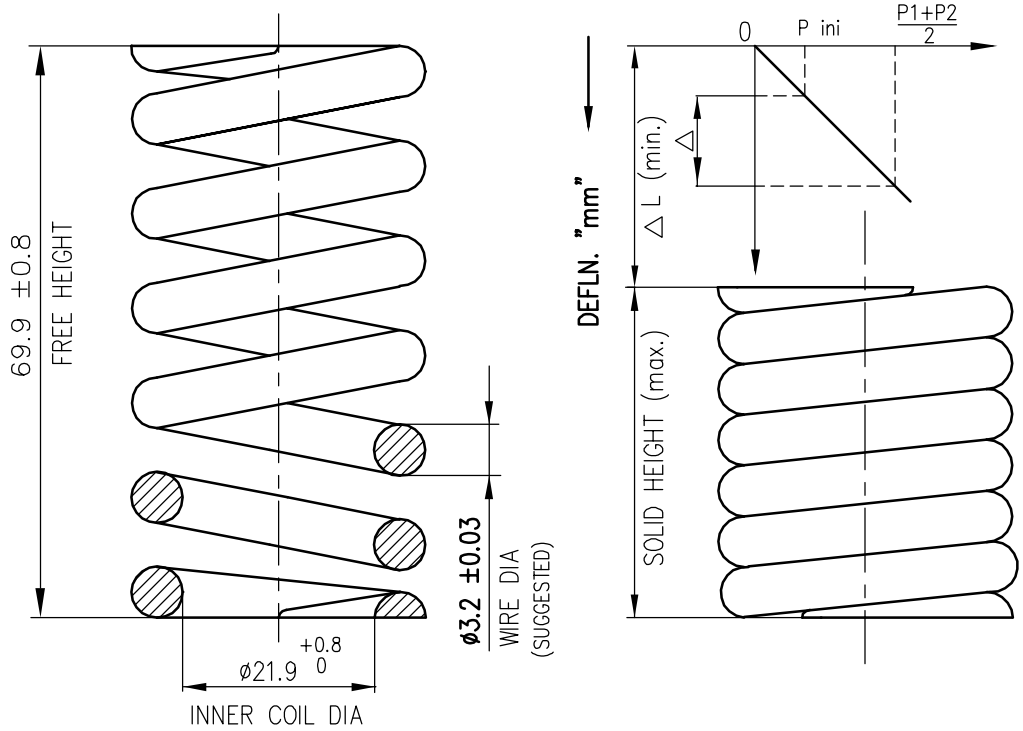
DEPT	SCALE	WEIGHT (KG).	REFERENCE INFORMATIONS	NO. OF ITEMS
VL	NTS	90	MATERIAL CODE: 964613670000	
CODE 310				

TITLE	CARD CODE	DRAWING NO.	REV
SPRING	U 01	4-V-CV51-94041	00

Size A4

CORPORATE DRG ID:TP-DG-4-V-CV51-94041/00

ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300140	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	0.893
04	SOLID DEFLECTION △L min.		mm	$39.6^{+2.4}_{-0.0}$
05	INITIAL LOADING P ini		Kg	5.3
06	TEST DEFLECTION △		mm	27.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	28.8
		P_2 MAX.	Kg	31.3
08	TILT DEFLECTION		mm	33.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.5 ±0.25
10	SPRING WEIGHT	Kg	0.05
11	PITCH	mm	8.5 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	7.5
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964151540000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	21.08.14	
	CHKD: S.M	21.08.14	
	APPD: E.A	21.08.14	
02	ALTD: MRC	24.04.97	
	CHKD: KSR	24.04.97	
	APPD: KSR	24.04.97	

NOTES UPDATED
DCN.No.801682

RETRACED & UPDATED
DCN: SR: 0188

	NAME	SIGN	DATE
DRAWN	MRC		24.04.97
CHECKED	KSR		24.04.97
APPROVED	KSR		24.0

TITLE: SPRING

DRG No. 4-V-J014-21054 REV. 03

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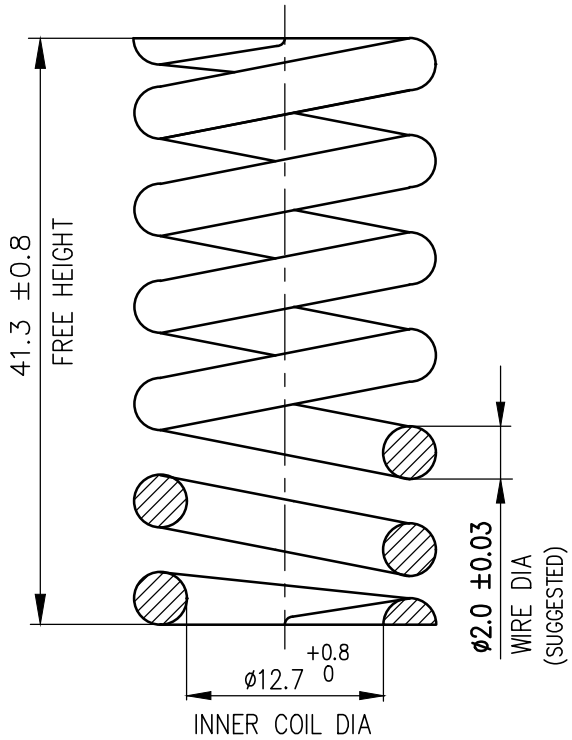
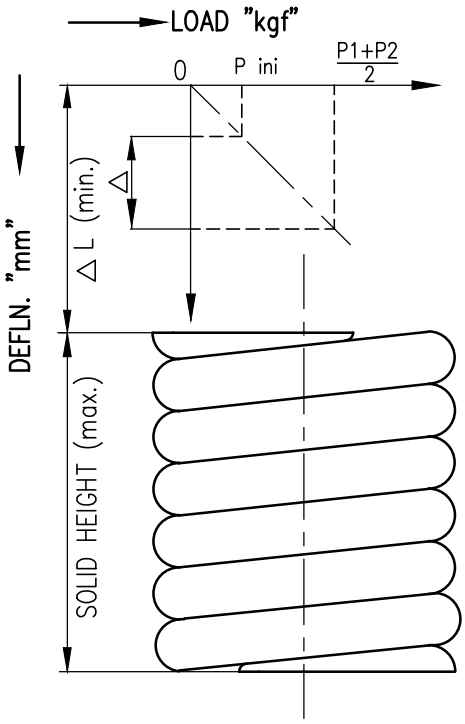
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000140	
02	MAX. OUTSIDE DIA		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	0.498
04	AVERAGE DEFLECTION △L min.		mm	16.9
05	INITIAL LOADING P ini		Kg	0.9
06	TEST DEFLECTION △		mm	7.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	4.6
		P_2 MAX.	Kg	5.0
08	TILT DEFLECTION		mm	9.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	10.2 ±0.25
10	SPRING WEIGHT	Kg	0.01
11	PITCH	mm	3.7 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	520
13	SPRING CODE	964151930000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
04	ALTD: A.P	06.02.16	OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016	03	ALTD: G.V	25.09.08	DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800783 DT.07.01.08
	CHKD: S.M	06.02.16			CHKD: E.A	25.09.08	
	APPD: E.A	06.02.16			APPD: E.A	25.09.08	

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		24.09.08
CHECKED	E.ATHIANNAVI		24.09
APPROVED	E.ATHIANNAVI		24.09

TITLE: SPRING

DRG No. 4-V-J014-21084 REV. 04

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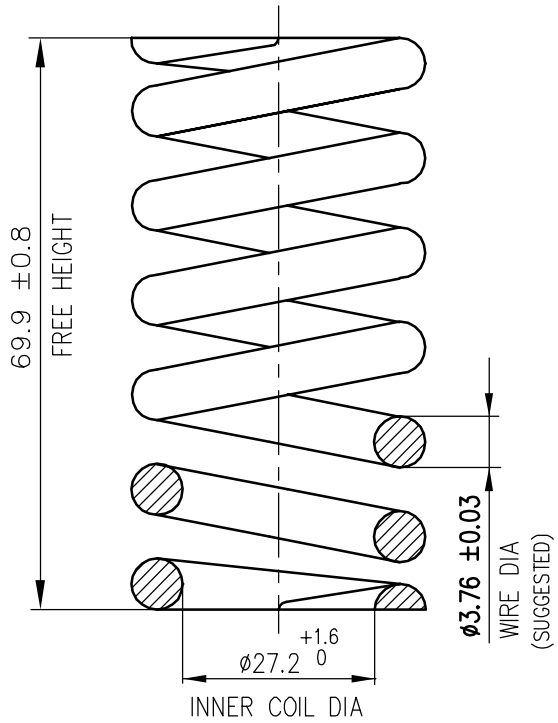
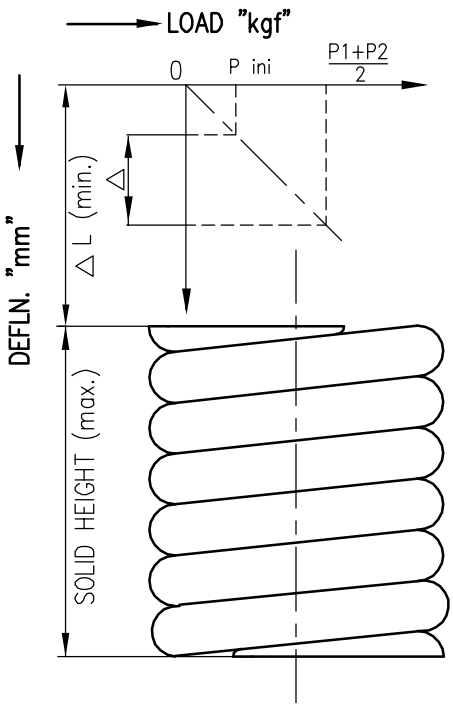
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100140	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±%)		Kg/mm	1.071
04	SOLID DEFLECTION △L min.		mm	$38.1^{+2.4}_{-0.0}$
05	INITIAL LOADING P ini		Kg	6.1
06	TEST DEFLECTION △		mm	26.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	33.2
		P_2 MAX.	Kg	36.2
08	TILT DEFLECTION		mm	32.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.3 ±0.25
10	SPRING WEIGHT	Kg	0.06
11	PITCH	mm	9.8 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	718
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964155610000/ 974521610000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
02	ALTD: G.V	26.08.14	01	ALTD: G.V	15.09.07
	CHKD: S.M	26.08.14		CHKD: E.A	15.09.07
	APPD: E.A	26.08.14		APPD: E.A	15.09.07

NOTES UPDATED
DCN.No.801682

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.07

365-081

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.09.07
CHECKED	E.ATHIANNAVI		15.09.07
APPROVED	E.ATHIANNAVI		15.09

TITLE: SPRING

DRG No. 4-V-J014-21710 REV. 02

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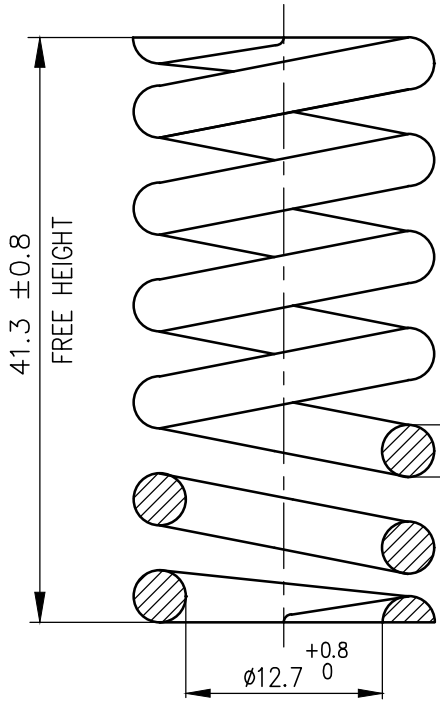

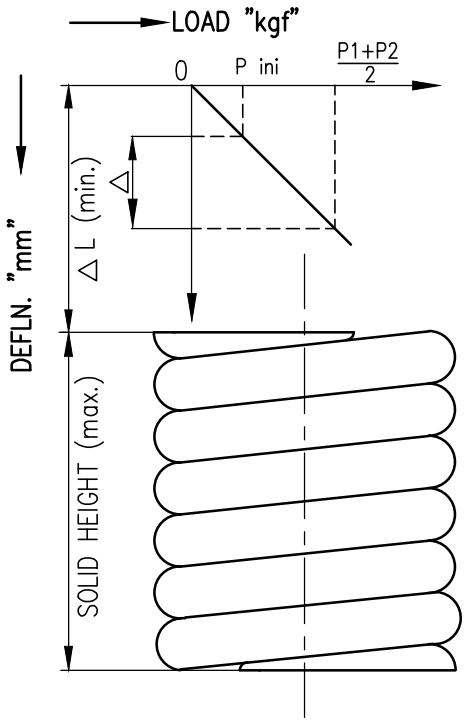

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100150	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	0.750
04	SOLID DEFLECTION △L min.		mm	20.4
05	INITIAL LOADING P ini		Kg	2.3
06	TEST DEFLECTION △		mm	14.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	12.5
		P_2 MAX.	Kg	13.5
08	TILT DEFLECTION		mm	17.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	8.1 ±0.25
10	SPRING WEIGHT	Kg	0.01
11	PITCH	mm	4.6 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	425
13	SPRING CODE	964150890000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
05	ALTD: A.P	06.02.16	
	CHKD: S.M	06.02.16	
	APPD: E.A	06.02.16	

OUTSIDE DIA MAX. LIMIT & NOTES REVISED

DCP.NO.802077 Dt. 06-02-2016

REV.			
04	ALTD: G.V	18.08.14	
	CHKD: S.M	18.08.14	
	APPD: E.A	18.08.14	

NOTES UPDATED
DCN.No.801682

		NAME	SIGN	DATE
365-081	DRAWN	G.VENKATESWARALU		12.05.07
	CHECKED	E.ATHIANNAVI		12.(
	APPROVED	E.ATHIANNAVI		12.(

TITLE: SPRING

DRG No. 4-V-J015-21202 REV. 05

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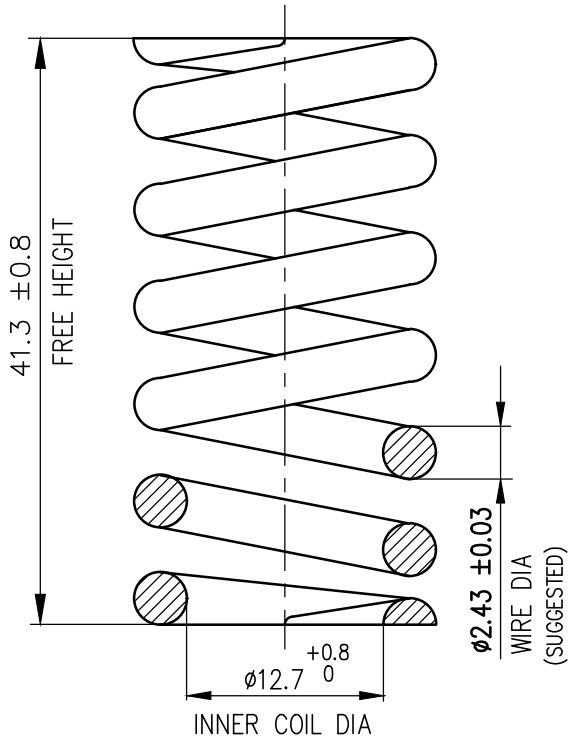

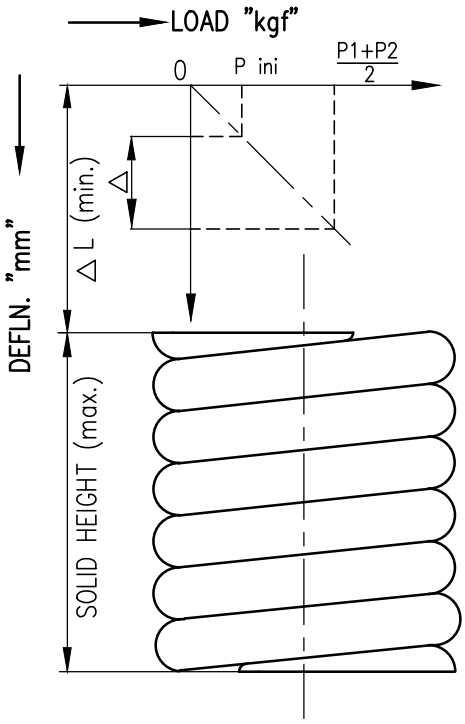

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000150	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	1.014
04	AVERAGE DEFLECTION △L min.		mm	11.2
05	INITIAL LOADING P ini		Kg	1.7
06	TEST DEFLECTION △		mm	7.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	9.3
		P_2 MAX.	Kg	10.0
08	TILT DEFLECTION		mm	9.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	10.0 ±0.25
10	SPRING WEIGHT	Kg	0.02
11	PITCH	mm	3.6 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	526
13	SPRING CODE	964150810000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
05	ALTD: A.P	06.02.16	OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016
	CHKD: S.M	06.02.16	
	APPD: E.A	06.02.16	
04	ALTD: G.V	26.07.10	NOTES UPDATED DCN.No.801041
	CHKD: S.M	26.07.10	
	APPD: E.A	26.07.10	

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.05.07
CHECKED	E.ATHIANNAVI		15.05
APPROVED	E.ATHIANNAVI		15.05

TITLE: SPRING

DRG No. 4-V-J015-21242 REV. 05

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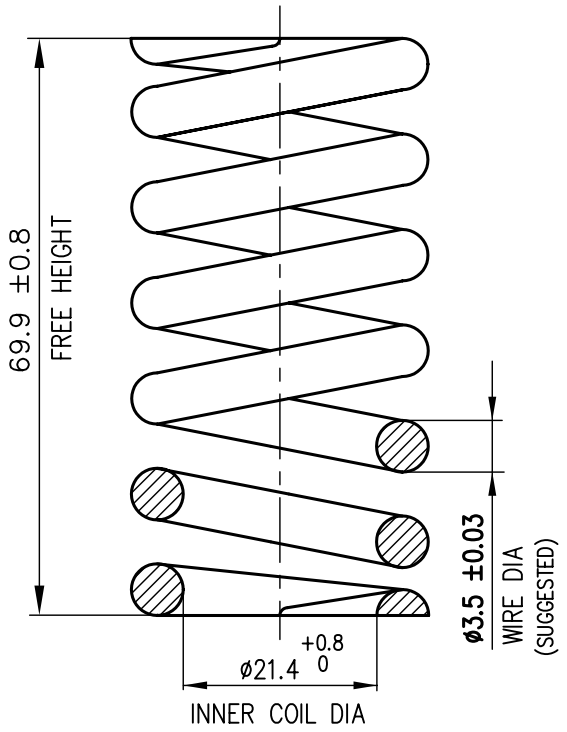

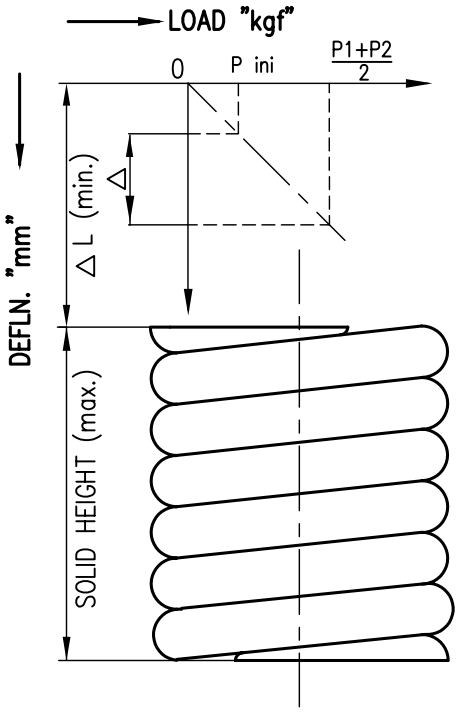

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300150	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	1.250
04	AVERAGE DEFLECTION △L min.		mm	34.8
05	INITIAL LOADING Pini		Kg	6.5
06	TEST DEFLECTION △		mm	24.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	35.5
		P_2 MAX.	Kg	38.6
08	TILT DEFLECTION		mm	29.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.9 ±0.25
10	SPRING WEIGHT	Kg	0.053
11	PITCH	mm	8.0 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	697
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964158360000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		17.12.08
CHECKED	E.ATHIANNAVI		17.12.08
APPROVED	E.ATHIANNAVI		17.12.0

TITLE: SPRING

DRG No. 4-V-J015-21784 REV. 00

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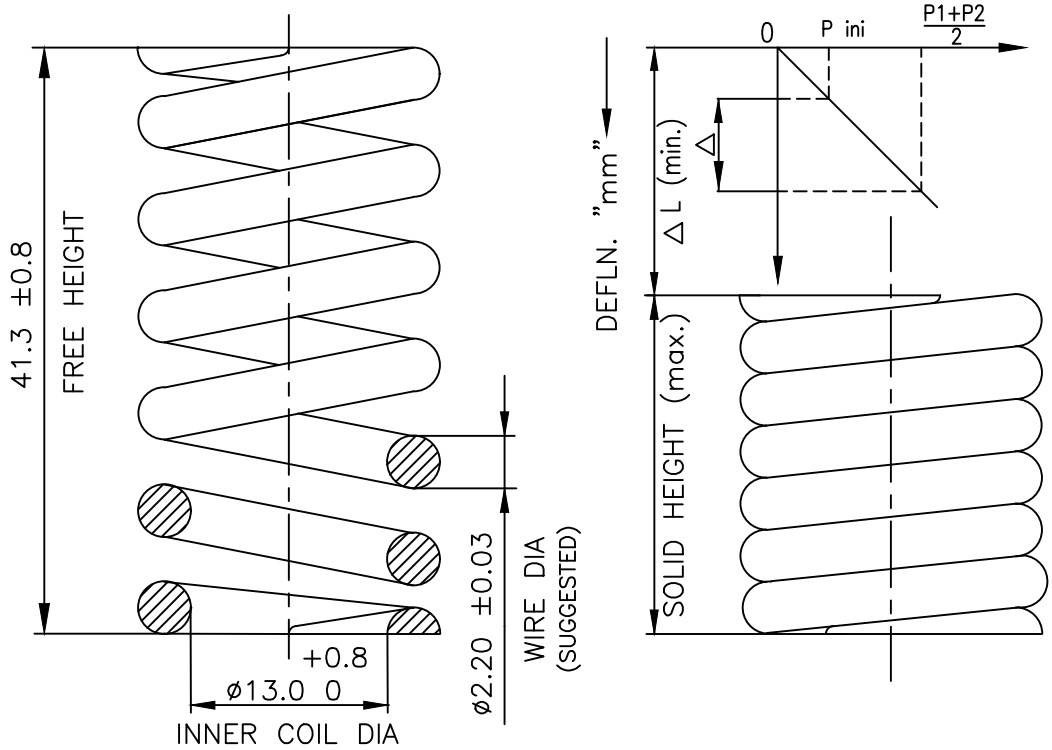
ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100150SY	
02	OUTSIDE DIA MAX.LIMIT		(mm)	23.8
03	SPRING RATE		(Kg/mm)	0.7499
04	AVERAGE DEFLECTION ΔL min.		(mm)	20.4
05	INITIAL LOADING P_{ini}		(Kgs)	2.3
06	TEST DEFLECTION Δ		(mm)	14.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	12.5
		P_2 MAX.	(Kgs)	13.5
08	TILT DEFLECTION		(mm)	17.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	$9.2^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.01
11	PITCH	(mm)	4.7±0.3
12	DEVELOPED LENGTH OF ROD	(mm)	–
13	RAW MATERIAL DIA x LENGTH	(mm)	–
14	RAW MATERIAL WEIGHT	(Kgs)	–
15	PROCESS OF MANUFACTURE	–	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST : ASTM A313 TYPE-316/A276 TYPE-316.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.02	ALTD:	REV.01	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	J.Dhanabal		19.06.2018
CHECKED	R.Rabin		19.06.2
APPROVED	S.Madhulingam		19.06.2

365-081

TITLE SPRING

DRG No. 4-V-J015-21869 REV. 00

COMP. CODE: 974611580000

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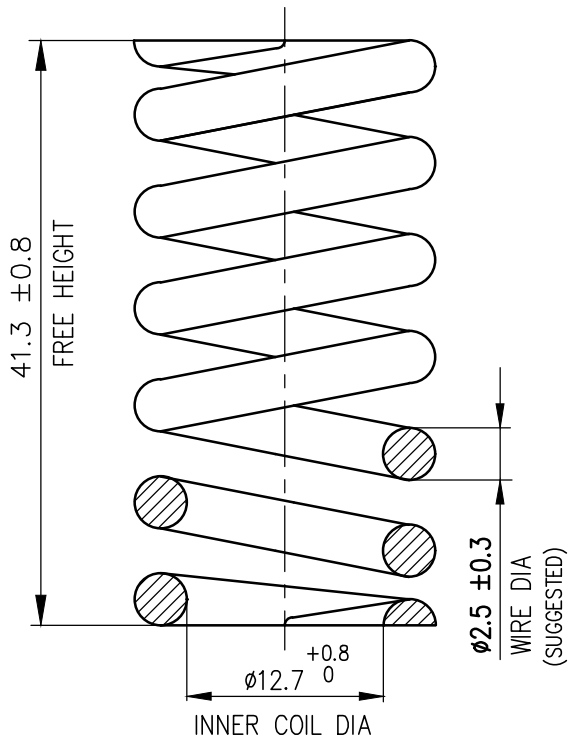

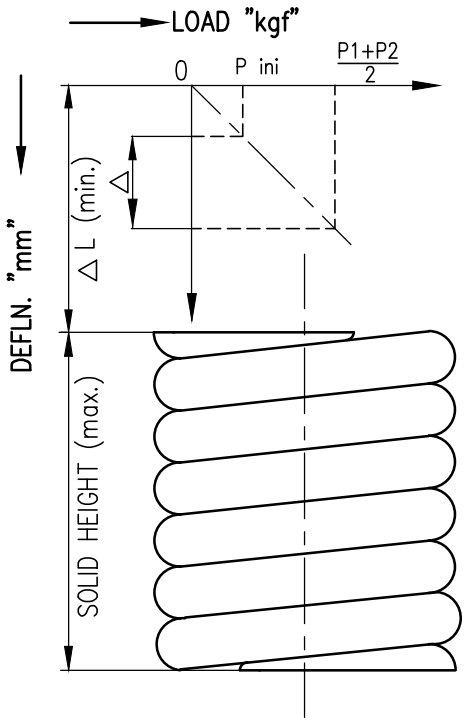

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100160	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	1.286
04	SOLID DEFLECTION △L min.		mm	14.4
05	INITIAL LOADING P_{ini}		Kg	2.8
06	TEST DEFLECTION △		mm	10.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	15.1
		P_2 MAX.	Kg	16.3
08	TILT DEFLECTION		mm	12.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	8.7 ±0.25
10	SPRING WEIGHT	Kg	0.02
11	PITCH	mm	4.2 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	465
13	SPRING CODE	964150680000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
05	ALTD: A.P	06.02.16	04	ALTD: G.V	04.08.14
	CHKD: S.M	06.02.16		CHKD: S.M	04.08.14
	APPD: E.A	06.02.16		APPD: E.A	04.08.14
OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016			NOTES UPDATED DCN.No.801682		

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.05.07
CHECKED	E.ATHIANNAVI		15.(
APPROVED	E.ATHIANNAVI		15.(

TITLE: SPRING

DRG No. 4-V-J016-21117 REV. 05

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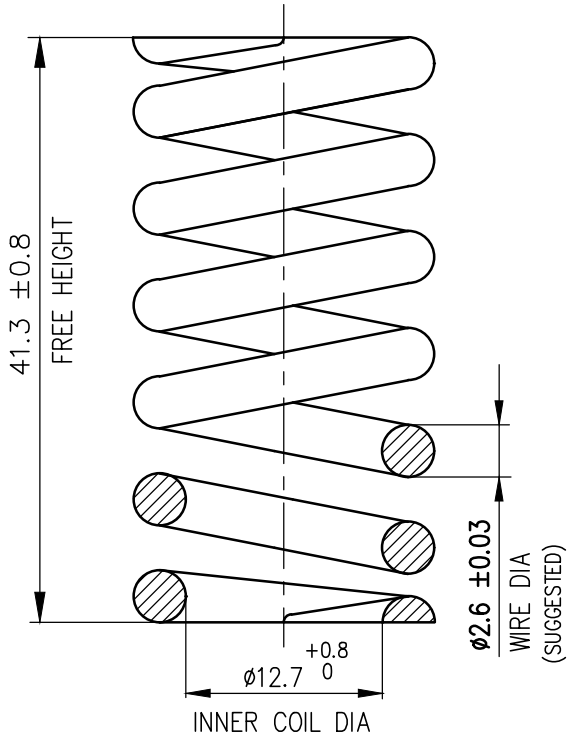

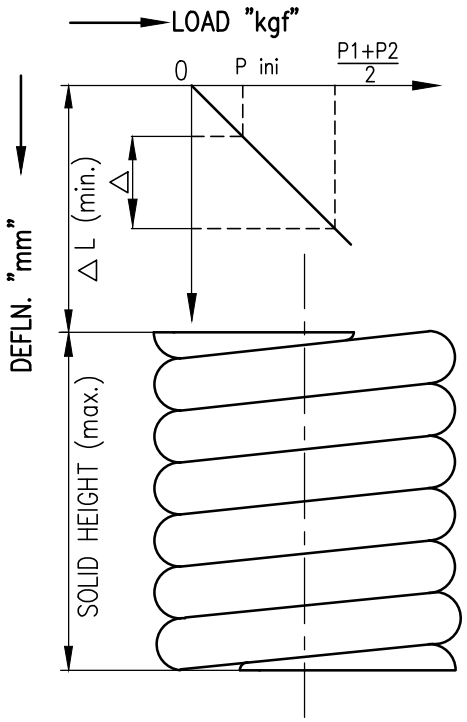

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000160	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	1.561
04	SOLID DEFLECTION △L min.		mm	11.0
05	INITIAL LOADING P ini		Kg	2.6
06	TEST DEFLECTION △		mm	7.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	14.0
		P_2 MAX.	Kg	15.2
08	TILT DEFLECTION		mm	9.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	8.3 ±0.25
10	SPRING WEIGHT	Kg	0.02
11	PITCH	mm	4.4 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	450
13	SPRING CODE	964150780000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
05	ALTD: A.P	06.02.16		04	ALTD: G.V	07.08.14
	CHKD: S.M	06.02.16			CHKD: S.M	07.08.14
	APPD: E.A	06.02.16			APPD: E.A	07.08.14
OUTSIDE DIA MAX. LIMIT REVISED DCP.NO.802077 Dt. 06-02-2016				NOTES UPDATED DCN.No.801682		

		NAME	SIGN	DATE
365-081	DRAWN	G.VENKATESWARALU		07.05.07
	CHECKED	E.ATHIANNAVI		07.
	APPROVED	E.ATHIANNAVI		07.

TITLE: SPRING

DRG No. 4-V-J016-21189 REV. 05

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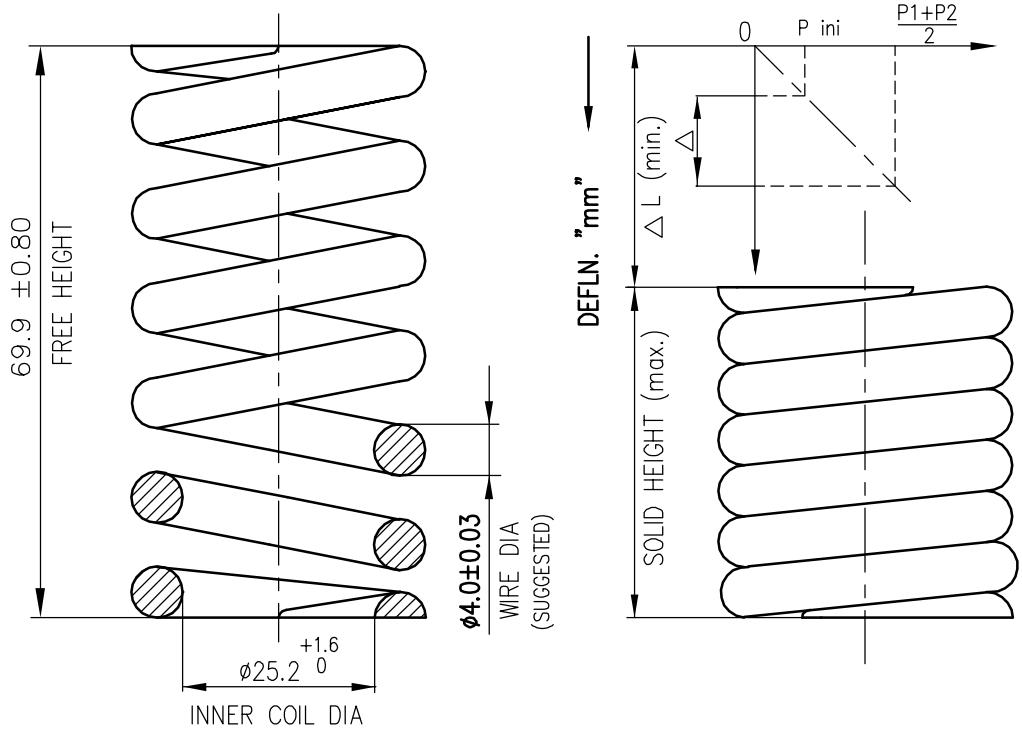

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100160	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	1.803
04	SOLID DEFLECTION △L min.		mm	$45.2^{+2.4}_{-0.0}$
05	INITIAL LOADING P ini		Kg	12.2
06	TEST DEFLECTION △		mm	31.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	66.5
		P_2 MAX.	Kg	72.2
08	TILT DEFLECTION		mm	38.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.8±0.25
10	SPRING WEIGHT	Kg	0.06
11	PITCH	mm	10.7±0.3
12	DEVELOPED LENGTH OF ROD	mm	625
13	SPRING CODE	964150790000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	11.08.14	
	CHKD: S.M	11.08.14	
	APPD: E.A	11.08.14	

REV.			
02	ALTD: G.V	30.06.08	
	CHKD: E.A	30.06.08	
	APPD: E.A	30.06.08	

NOTES UPDATED
DCN.No.801682

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

365-081

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		30.06.08
CHECKED	E.ATHIANNAVI		30.06.08
APPROVED	E.ATHIANNAVI		30.0

TITLE: SPRING

DRG No. 4-V-J016-21545 REV. 03

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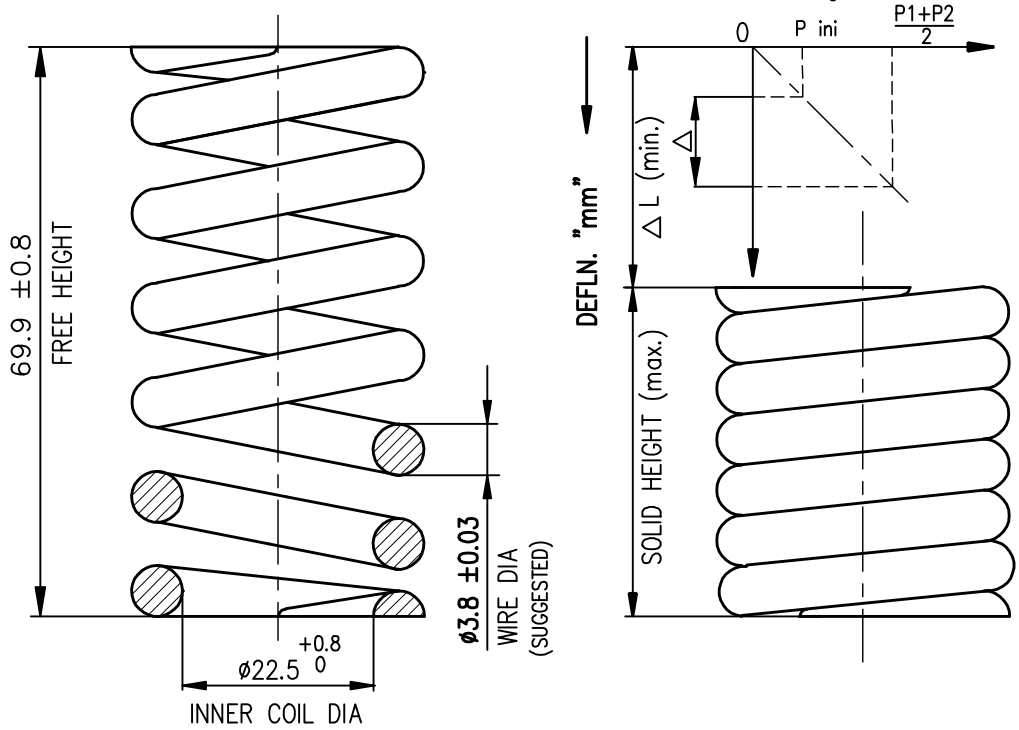

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300160	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	1.625
04	AVERAGE DEFLECTION △L min.		mm	36.3
05	INITIAL LOADING P_{ini}		Kg	8.8
06	TEST DEFLECTION △		mm	25.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	48.0
		P_2 MAX.	Kg	52.2
08	TILT DEFLECTION		mm	30.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.1 ±0.25
10	SPRING WEIGHT	Kg	0.06
11	PITCH	mm	8.7 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	675
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964151920000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. PHOSPHATE COAT AS PER LATEST APPLICABLE QUALITY PROCEDURE.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	24.06.09
	CHKD:		CHKD: S.M	24.06.09
	APPD:		APPD: E.A	24.06.09

DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800903 Dt.21.01.09.

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		24.06.09
CHECKED	S.Madhulingam		24.06.09
APPROVED	E.Athiannavi		24.06.0

TITLE: SPRING

DRG No. 4-V-J016-21630 REV. 01

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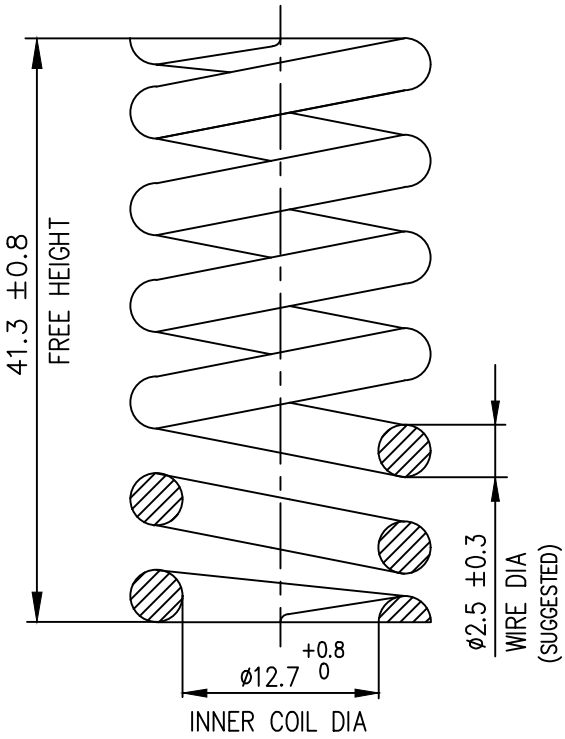

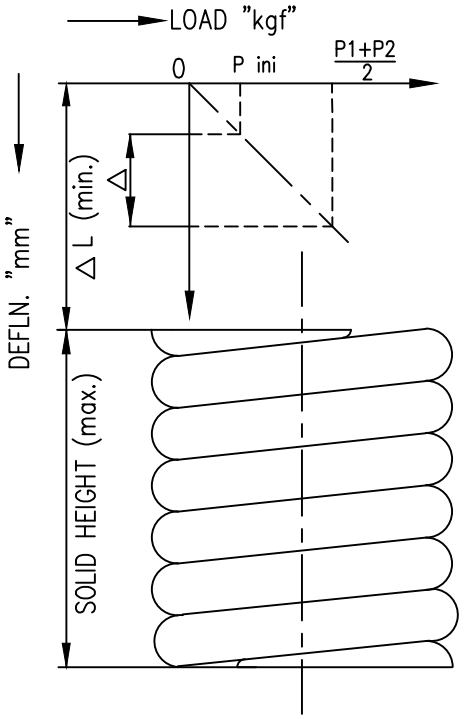

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100160	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	1.286
04	SOLID DEFLECTION Δ L min.		mm	14.4
05	INITIAL LOADING P ini		Kg	2.8
06	TEST DEFLECTION Δ		mm	10.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	15.1
		P_2 MAX.	Kg	16.3
08	TILT DEFLECTION		mm	12.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$8.7^{+0}_{-0.5}$
10	SPRING WEIGHT	Kg	0.02
11	PITCH	mm	4.2 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	465
13	SPRING CODE	964150680002	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 & 12 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 GR.2/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. SPRING SHALL BE COATED WITH ZINC (OR) NICKEL PLATING.

REV.	ALTD:	REV.	ALTD:
05	CHKD:	04	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	J.Dhanabal		01.01.19
CHECKED	R.Rabin		01.[illegible]
APPROVED	S.Madhulingam		01.[illegible]

TITLE: SPRING

DRG No. 4-V-J016-21895 REV. 00

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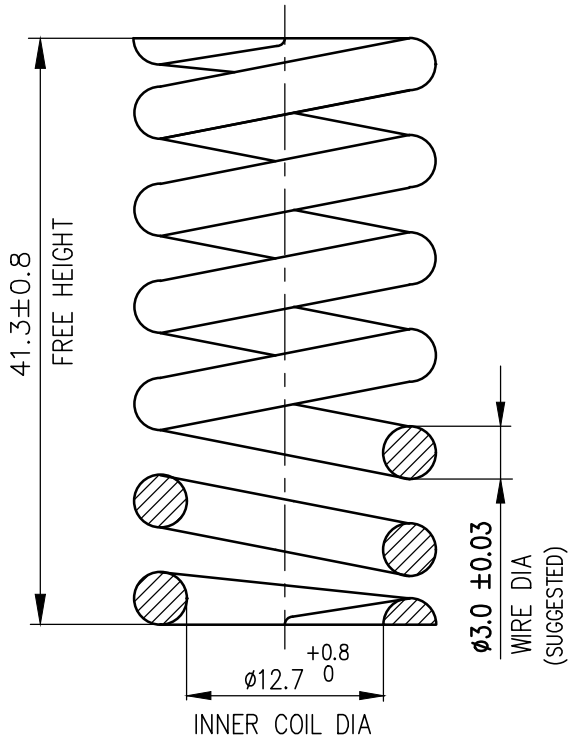

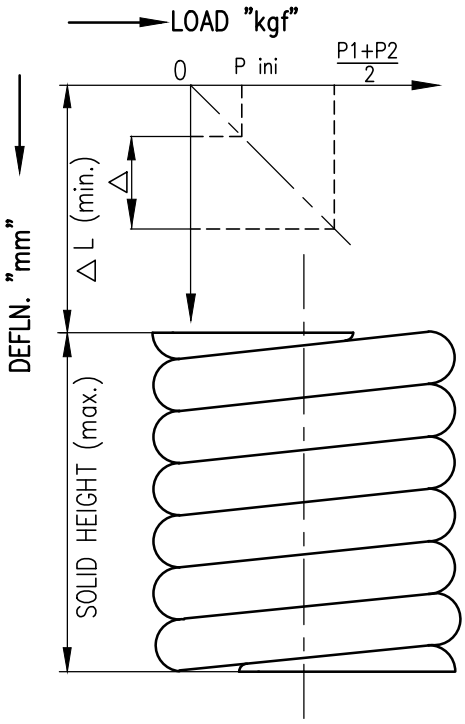

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000170	
02	MAX. OUTSIDE DIA		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	2.651
04	AVERAGE DEFLECTION △L min.		mm	10.9
05	INITIAL LOADING P ini		Kg	4.3
06	TEST DEFLECTION △		mm	7.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	23.5
		P_2 MAX.	Kg	25.5
08	TILT DEFLECTION		mm	9.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	8.0 ±0.25
10	SPRING WEIGHT	Kg	0.03
11	PITCH	mm	4.4 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	445
13	SPRING CODE	964150920000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: A.P	06.02.16	OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016
	CHKD: S.M	06.02.16	
	APPD: E.A	06.02.16	
02	ALTD: G.V	24.09.08	DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800783 DT.07.01.08
	CHKD: E.A	24.09.08	
	APPD: E.A	24.09.08	

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		24.09.08
CHECKED	E.ATHIANNAVI		24.09.
APPROVED	E.ATHIANNAVI		24.09.

TITLE: SPRING

DRG No. 4-V-J017-21204 REV. 03

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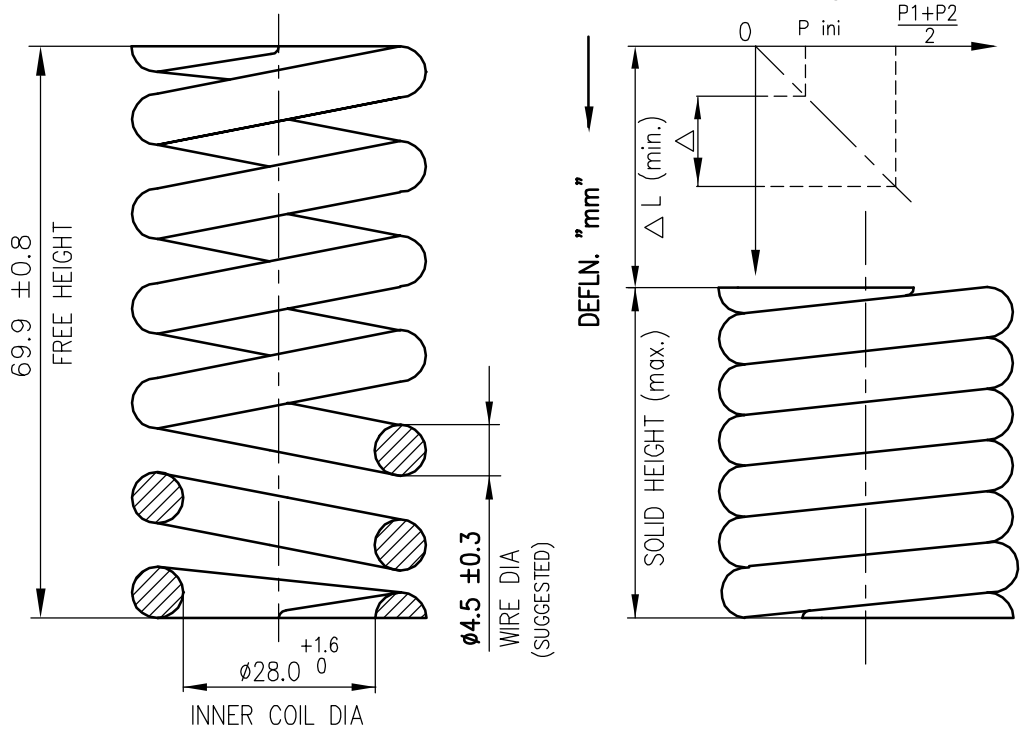
ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100170	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	2.178
04	SOLID DEFLECTION △L min.		mm	41.2 $^{+2.4}_{-0}$
05	INITIAL LOADING P ini		Kg	13.5
06	TEST DEFLECTION △		mm	28.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	73.2
		P_2 MAX.	Kg	79.4
08	TILT DEFLECTION		mm	35.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.5 ±0.25
10	SPRING WEIGHT	Kg	0.08
11	PITCH	mm	11 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	672
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964150730000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
03	ALTD: G.V	21.01.14		02	ALTD: MRC	15.05.07	
	CHKD: S.M	21.01.14			CHKD: KSR	15.05.07	
	APPD: E.A	21.01.14			APPD: KSR	15.05.07	
NOTES UPDATED DCN.No.801682				RETRACED & UPDATED DCN: SR0188			

	NAME	SIGN	DATE
DRAWN	MRC		24.04.97
CHECKED	KSR		24.04.97
APPROVED	KSR		24.0

365-081

TITLE: SPRING

DRG No. 4-V-J017-21223 REV. 03

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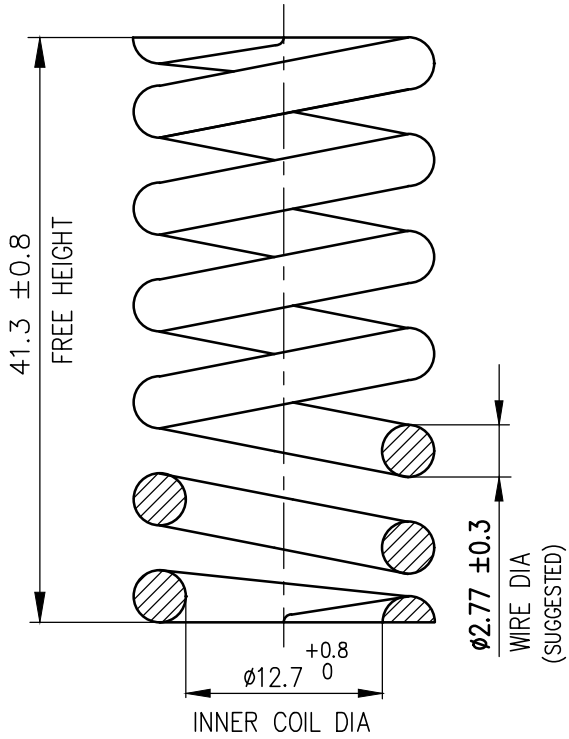

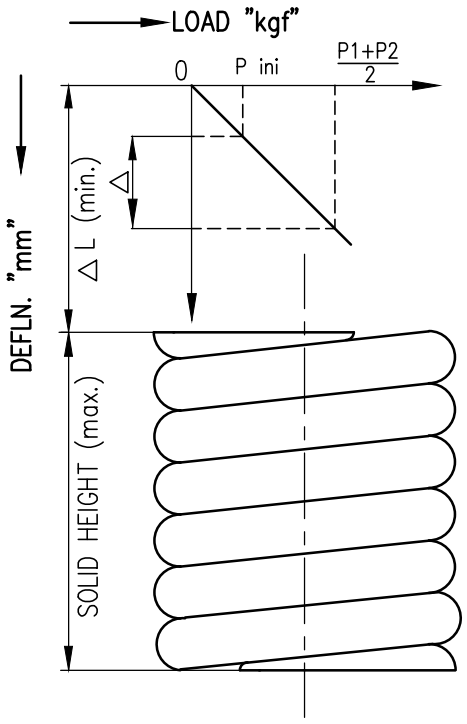

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100170	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	2.125
04	SOLID DEFLECTION △L min.		mm	14.9
05	INITIAL LOADING P ini		Kg	4.7
06	TEST DEFLECTION △		mm	10.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	25.7
		P_2 MAX.	Kg	27.9
08	TILT DEFLECTION		mm	12.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.6 ±0.25
10	SPRING WEIGHT	Kg	0.02
11	PITCH	mm	4.7 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	418
13	SPRING CODE	964150740000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
03	ALTD: A.P	06.02.16		02	ALTD: G.V	05.05.14
	CHKD: S.M	06.02.16			CHKD: S.M	05.05.14
	APPD: E.A	06.02.16			APPD: E.A	05.05.14
OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016				NOTES UPDATED DCN.No.801682		

	NAME	SIGN	DATE
DRAWN	MRC		24.04.97
CHECKED	KSR		24.
APPROVED	KSR		24.

TITLE: SPRING

DRG No. 4-V-J017-21391 REV. 03

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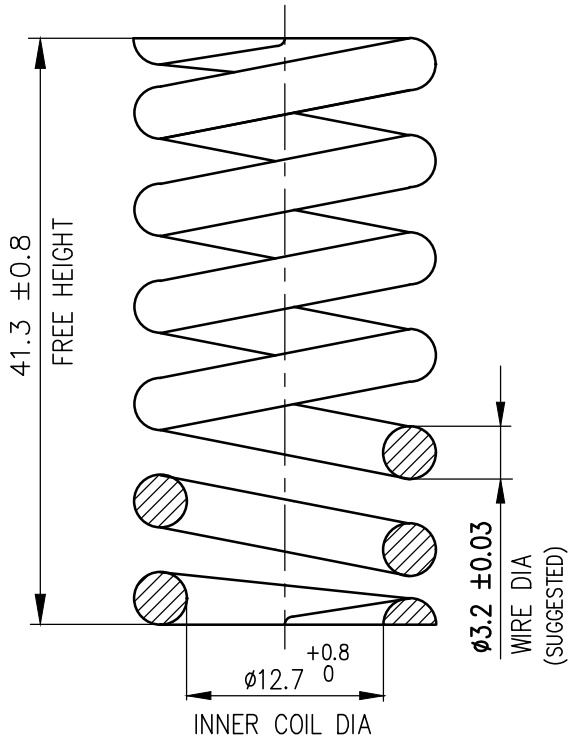

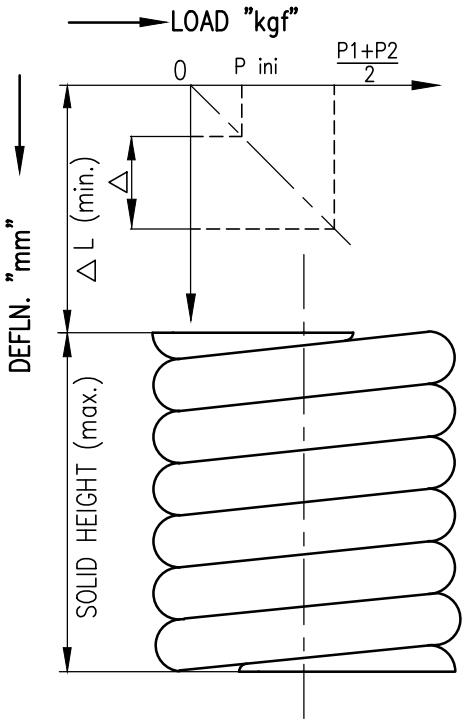

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100180	
02	MAX. OUTSIDE DIA		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	3.357
04	AVERAGE DEFLECTION △L min.		mm	13.6
05	INITIAL LOADING P ini		Kg	6.8
06	TEST DEFLECTION △		mm	9.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	37.2
		P_2 MAX.	Kg	40.4
08	TILT DEFLECTION		mm	11.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.9 ±0.25
10	SPRING WEIGHT	Kg	0.03
11	PITCH	mm	4.4 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	446
13	SPRING CODE	964150550000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
04	ALTD: A.P	06.02.16		03	ALTD: G.V	24.09.08
	CHKD: S.M	06.02.16			CHKD: E.A	24.09.08
	APPD: E.A	06.02.16			APPD: E.A	24.09.08
OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016				MATL. SPCN. UPDATED DCP.NO.800866 DT.23.09.08		

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.05.07
CHECKED	E.ATHIANNAVI		15.05
APPROVED	E.ATHIANNAVI		15.05

TITLE: SPRING

DRG No. 4-V-J018-21156 REV. 04

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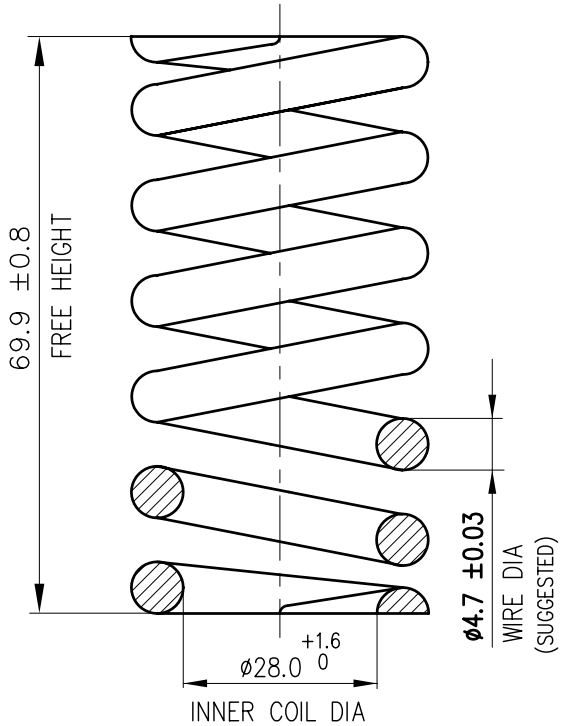

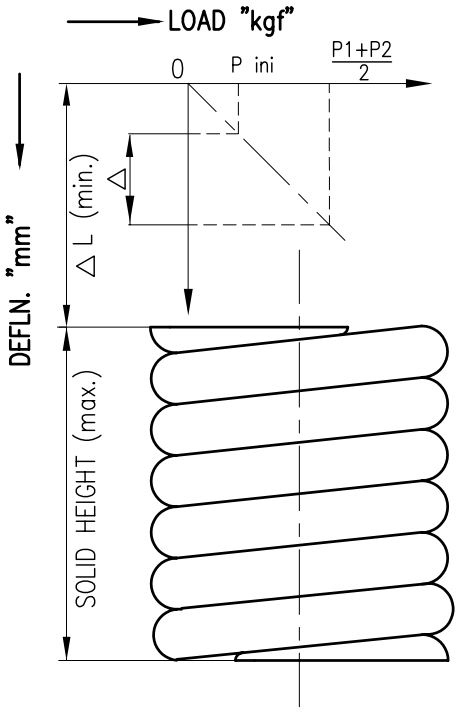

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100180	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	2.535
04	AVERAGE DEFLECTION △L min.		mm	38.6
05	INITIAL LOADING Pini		Kg	14.7
06	TEST DEFLECTION △		mm	27.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	79.8
		P_2 MAX.	Kg	86.6
08	TILT DEFLECTION		mm	32.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.6 ±0.25
10	SPRING WEIGHT	Kg	0.092
11	PITCH	mm	10.9 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	678
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964151500000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	04.12.09	
	CHKD: E.A	04.12.09	
	APPD: E.A	04.12.09	

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800903 DT.21.01.09

REV.			
01	ALTD:	MRC	24.04.97
	CHKD:	KSR	24.04.97
	APPD:	KSR	24.04.97

RETRACED AND UPDATED
DCN NO. SR:0188

	NAME	SIGN	DATE
DRAWN	M.R.C		24.04.97
CHECKED	K.S.R		24.04.9
APPROVED	K.S.R		24.04.

TITLE: SPRING

DRG No. 4-V-J018-21224 REV. 02

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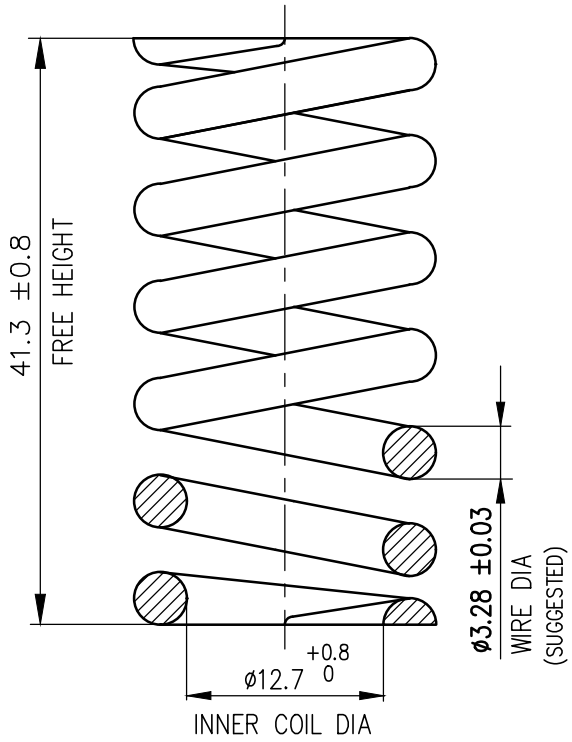

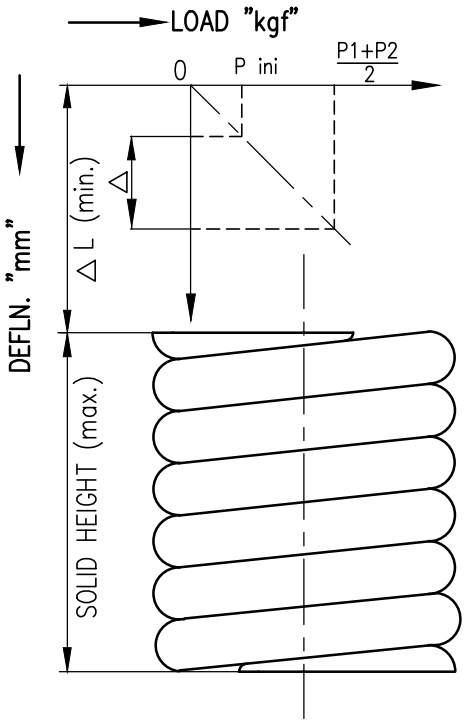

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000180	
02	MAX. OUTSIDE DIA		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	4.062
04	AVERAGE DEFLECTION △L min.		mm	10.7
05	INITIAL LOADING P ini		Kg	6.5
06	TEST DEFLECTION △		mm	7.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	35.6
		P_2 MAX.	Kg	38.6
08	TILT DEFLECTION		mm	9.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.1 ±0.25
10	SPRING WEIGHT	Kg	0.03
11	PITCH	mm	4.9 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	406
13	SPRING CODE	964150560000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: A.P	06.02.16	
	CHKD: S.M	06.02.16	
	APPD: E.A	06.02.16	

OUTSIDE DIA MAX. LIMIT & NOTES REVISED

DCP.NO.802077 Dt. 06-02-2016

REV.		
02	ALTD: G.V	05.08.10
	CHKD: S.M	05.08.10
	APPD: E.A	05.08.10

NOTES UPDATED
DCN.No.801041

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.05.07
CHECKED	E.ATHIANNAVI		15.05
APPROVED	E.ATHIANNAVI		15.05

TITLE: SPRING

DRG No. 4-V-J018-21520 REV. 03

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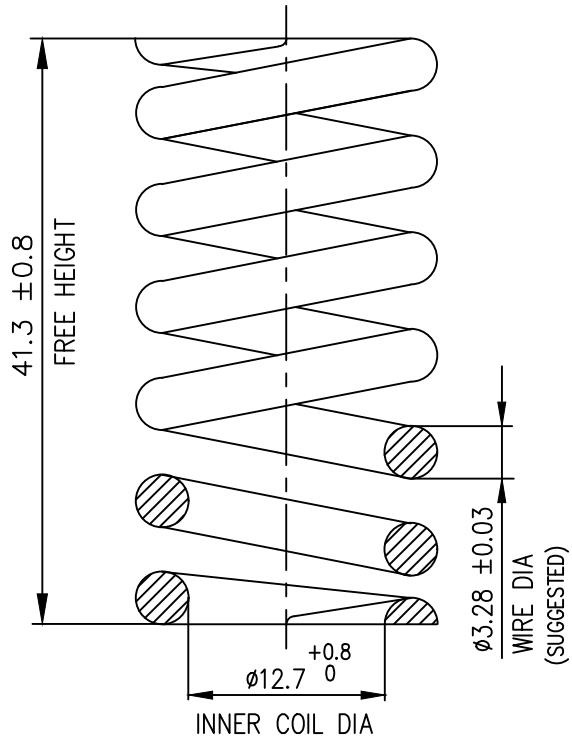

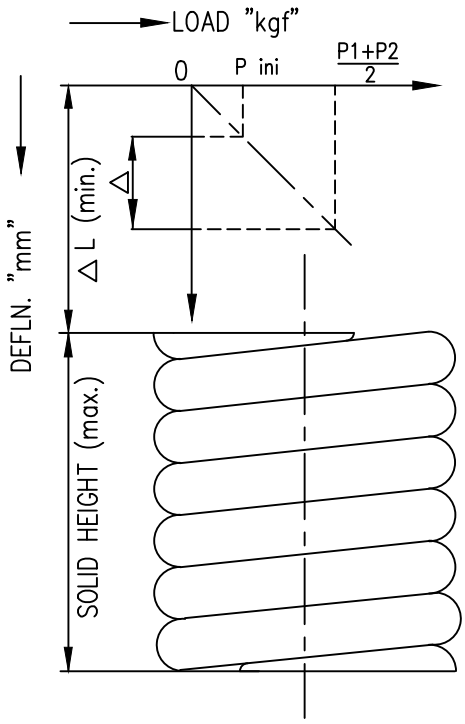

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000180	
02	MAX. OUTSIDE DIA		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	4.062
04	AVERAGE DEFLECTION △L min.		mm	10.7
05	INITIAL LOADING Pini		Kg	6.5
06	TEST DEFLECTION △		mm	7.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	35.6
		P_2 MAX.	Kg	38.6
08	TILT DEFLECTION		mm	9.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.1 ±0.25
10	SPRING WEIGHT	Kg	0.03
11	PITCH	mm	4.9 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	406
13	SPRING CODE	964165360000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:-

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR,
   ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED BY ASME.

REV.	ALTD:
	CHKD:
	APPD:

	NAME	SIGN	DATE
DRAWN	J.Dhanabal		23.01.19
CHECKED	R.Rabin		23.01.
APPROVED	S.Madhulingam		23.01.

TITLE: SPRING

DRG No. 4-V-J018-21897 REV. 00

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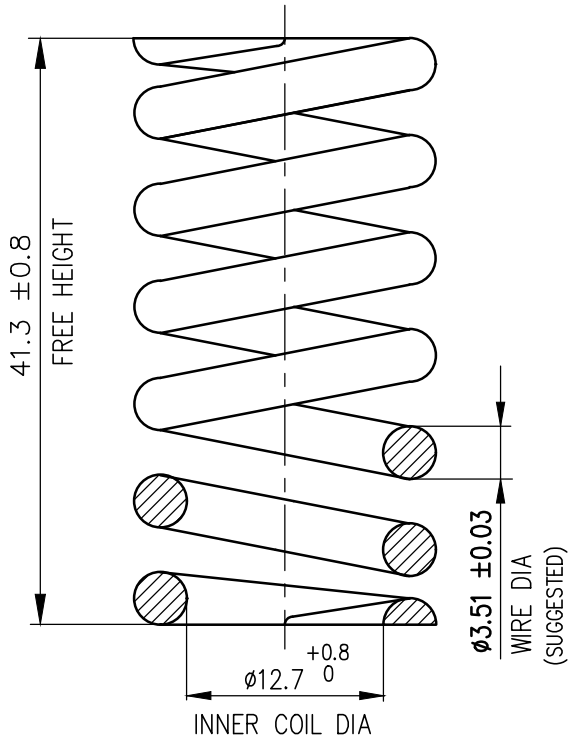

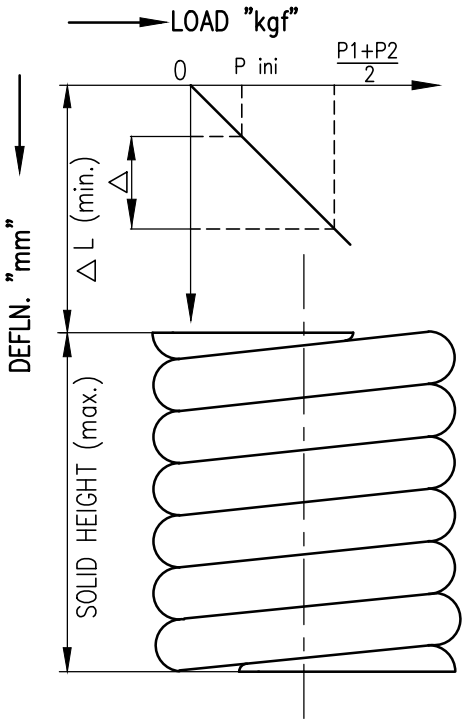

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000190	
02	MAX. OUTSIDE DIA		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	5.535
04	AVERAGE DEFLECTION △L min.		mm	10.6
05	INITIAL LOADING P ini		Kg	8.8
06	TEST DEFLECTION △		mm	7.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	47.8
		P_2 MAX.	Kg	51.9
08	TILT DEFLECTION		mm	9.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.5 ±0.25
10	SPRING WEIGHT	Kg	0.03
11	PITCH	mm	5.3 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	384
13	SPRING CODE	964150570000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: A.P	06.02.16	OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016
	CHKD: S.M	06.02.16	
	APPD: E.A	06.02.16	
02	ALTD: G.V	12.08.09	MATERIALS UPDATED DCP. NO. 800878 dt.01.11.08
	CHKD: E.A	12.08.09	
	APPD: E.A	12.08.09	

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		14.05.07
CHECKED	E.ATHIANNAVI		14.05
APPROVED	E.ATHIANNAVI		14.05

TITLE: SPRING

DRG No. 4-V-J019-21612 REV. 03

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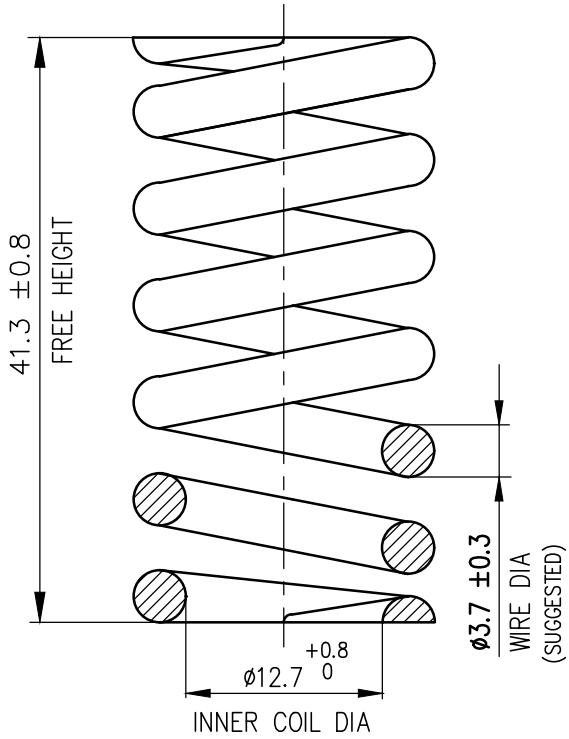

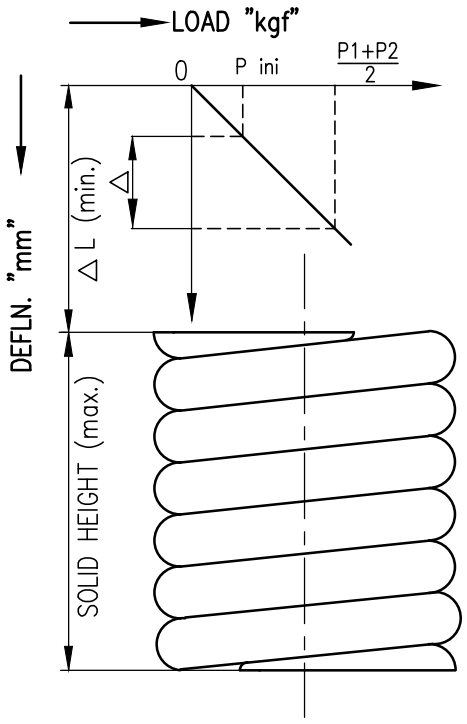

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000200	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	7.106
04	SOLID DEFLECTION △L min.		mm	10.4
05	INITIAL LOADING P ini		Kg	11.1
06	TEST DEFLECTION △		mm	7.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	60.5
		P_2 MAX.	Kg	65.7
08	TILT DEFLECTION		mm	8.9

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.0 ±0.25
10	SPRING WEIGHT	Kg	0.03
11	PITCH	mm	5.6 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	365
13	SPRING CODE	964150830000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
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4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
04	ALTD: A.P	06.02.16	03	ALTD: G.V	25.07.14
	CHKD: S.M	06.02.16		CHKD: S.M	25.07.14
	APPD: E.A	06.02.16		APPD: E.A	25.07.14

OUTSIDE DIA MAX. LIMIT & NOTES REVISED

DCP.NO.802077 Dt. 06-02-2016

NOTES UPDATED
DCN.No.801682

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		11.05.07
CHECKED	E.ATHIANNAVI		11.(
APPROVED	E.ATHIANNAVI		11.(

TITLE: SPRING

DRG No. 4-V-J020-21187 REV. 04

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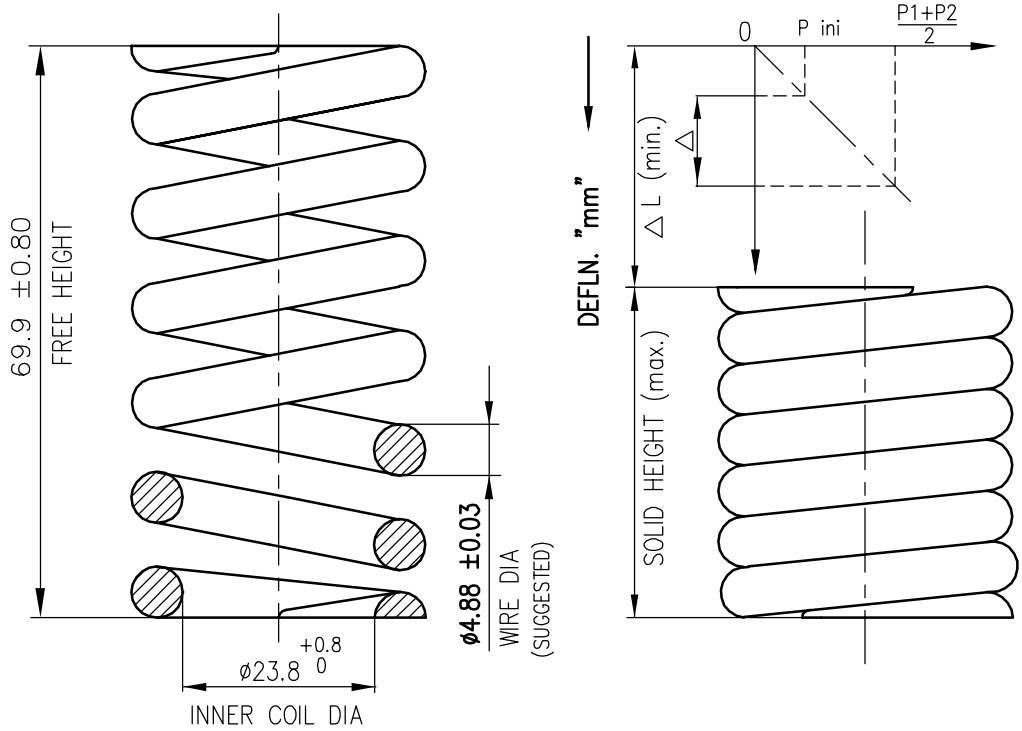

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100210	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	3.625
04	SOLID DEFLECTION △L min.		mm	$27.7^{+2.4}_{-0.0}$
05	INITIAL LOADING P ini		Kg	15.1
06	TEST DEFLECTION △		mm	19.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	81.8
		P_2 MAX.	Kg	88.8
08	TILT DEFLECTION		mm	23.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.7±0.25
10	SPRING WEIGHT	Kg	0.1
11	PITCH	mm	9.0 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	697
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964152950000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	23.08.14	
	CHKD: S.M	23.08.14	
	APPD: E.A	23.08.14	

REV.			
02	ALTD: G.V	15.09.07	
	CHKD: E.A	15.09.07	
	APPD: E.A	15.09.07	

NOTES UPDATED
DCN.No.801682

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.07

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.09.07
CHECKED	E.ATHIANNAVI		15.09.07
APPROVED	E.ATHIANNAVI		15.09

365-081

TITLE: SPRING

DRG No. 4-V-J021-21139 REV. 03

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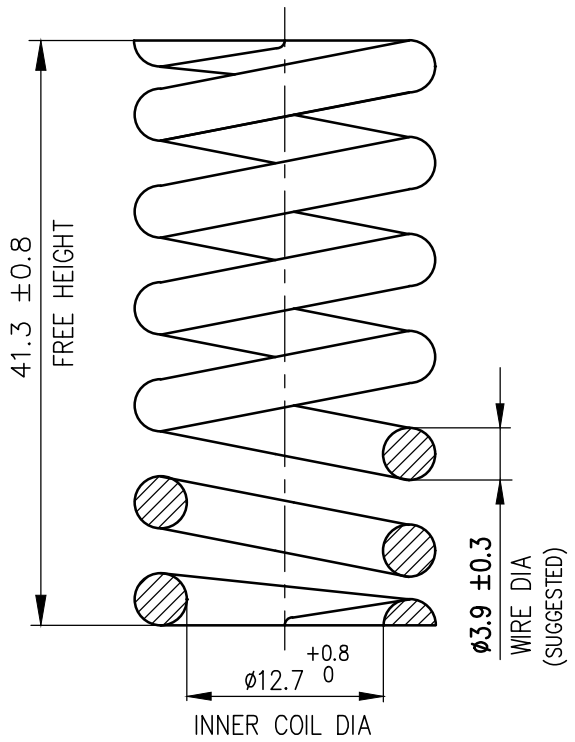

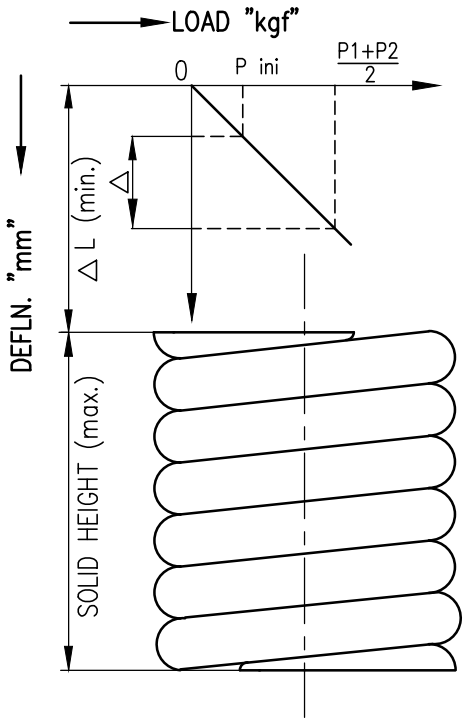

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000210	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	8.713
04	SOLID DEFLECTION △L min.		mm	10.3
05	INITIAL LOADING P ini		Kg	13.5
06	TEST DEFLECTION △		mm	7.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	73.2
		P_2 MAX.	Kg	79.5
08	TILT DEFLECTION		mm	8.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.1 ±0.25
10	SPRING WEIGHT	Kg	0.04
11	PITCH	mm	5.5 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	371
13	SPRING CODE	964151180000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

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2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
02	ALTD: A.P	06.02.16	OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016	01	ALTD: G.V	19.08.14	NOTES UPDATED DCN.No.801682
	CHKD: S.M	06.02.16			CHKD: S.M	19.08.14	
	APPD: E.A	06.02.16			APPD: E.A	19.08.14	

	NAME	SIGN	DATE
DRAWN	MRC		27.10.99
CHECKED	KSR		27.
APPROVED	KSR		27.

TITLE: SPRING

DRG No. 4-V-J021-21647 REV. 02

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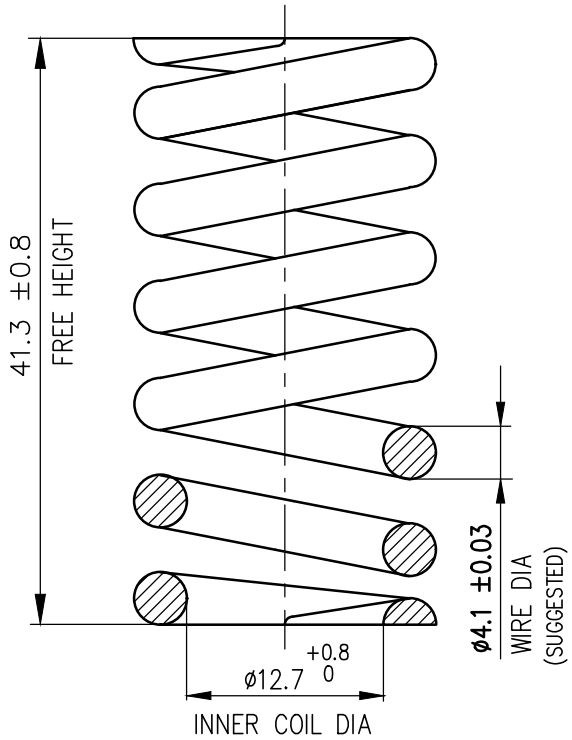

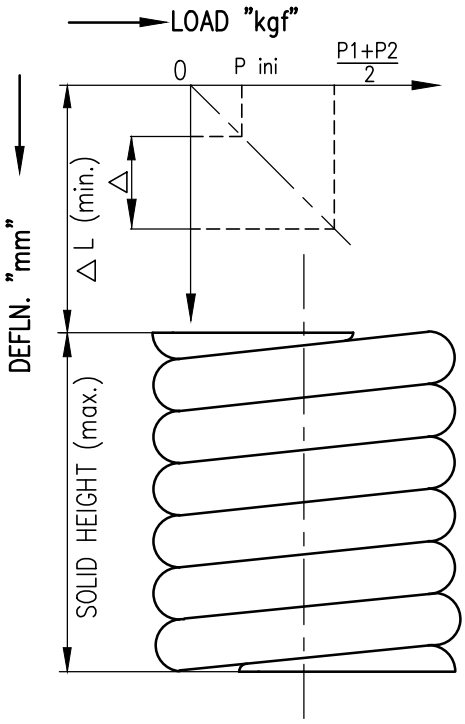

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000220	
02	OUTSIDE DIA MAX. LIMIT		mm	22.8
03	SPRING RATE (±4%)		Kg/mm	10.445
04	AVERAGE DEFLECTION △L min.		mm	10.2
05	INITIAL LOADING P ini		Kg	15.9
06	TEST DEFLECTION △		mm	7.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	86.5
		P_2 MAX.	Kg	93.9
08	TILT DEFLECTION		mm	8.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.8 ±0.25
10	SPRING WEIGHT	Kg	0.04
11	PITCH	mm	5.7 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	362
13	SPRING CODE	964150750000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

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2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
02	ALTD: A.P	06.02.16	01	ALTD: G.V	18.12.10
	CHKD: S.M	06.02.16		CHKD: S.M	18.12.10
	APPD: E.A	06.02.16		APPD: E.A	18.12.10
OUTSIDE DIA MAX. LIMIT & NOTES REVISED DCP.NO.802077 Dt. 06-02-2016			NOTES UPDATED DCN.No.801041		

	NAME	SIGN	DATE
DRAWN	MRC		30.11.96
CHECKED	KSR		30.11.
APPROVED	KSR		30.11

TITLE: SPRING

DRG No. 4-V-J022-21554 REV. 02

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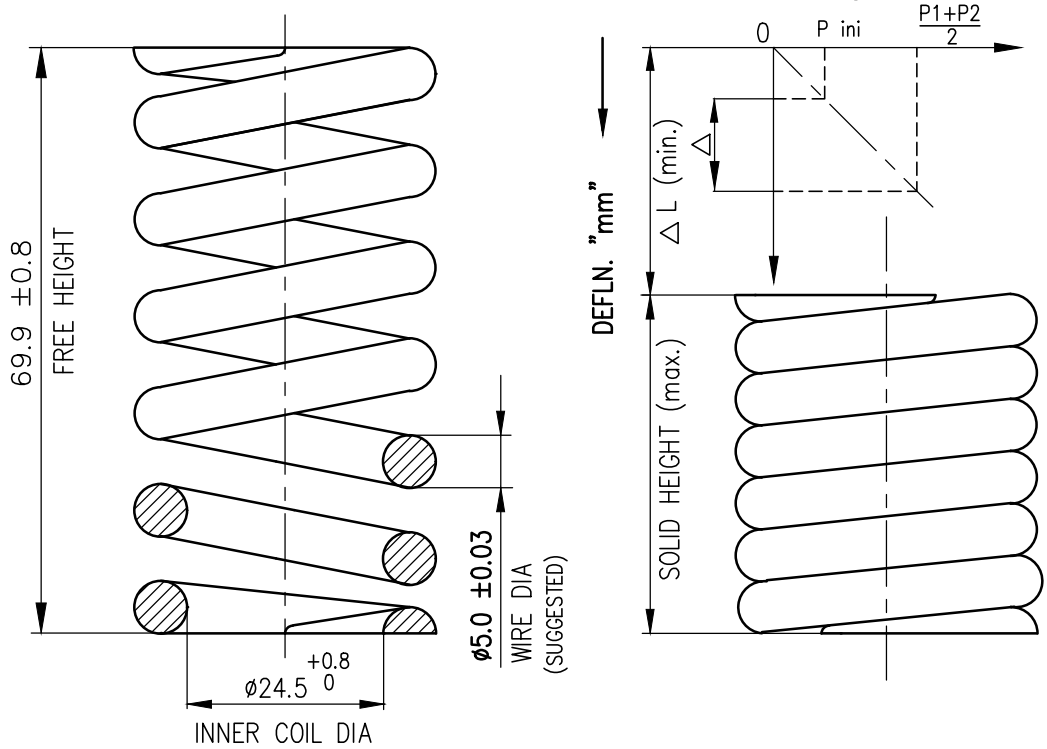

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300220	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	3.982
04	AVERAGE DEFLECTION △L min.		mm	29
05	INITIAL LOADING Pini		Kg	17.3
06	TEST DEFLECTION △		mm	20.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	94.1
		P_2 MAX.	Kg	102.2
08	TILT DEFLECTION		mm	24.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.22 ±0.25
10	SPRING WEIGHT	Kg	0.12
11	PITCH	mm	9.7 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	762
13	SPRING CODE	964165550000	
14	PROCESS OF MANUFACTURE	HOT/COLD COILING	

NOTES:

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2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

भेल BHEL
365-081/A
08.09.2020

	NAME	SIGN	DATE
DRAWN	J.DHANABAL		19.10.2020
CHECKED	R.RABIN		19.10.2
APPROVED	S.MADHULINGAM		19.10.2

TITLE: SPRING

DRG No. 4-V-J022-21801 REV. 00

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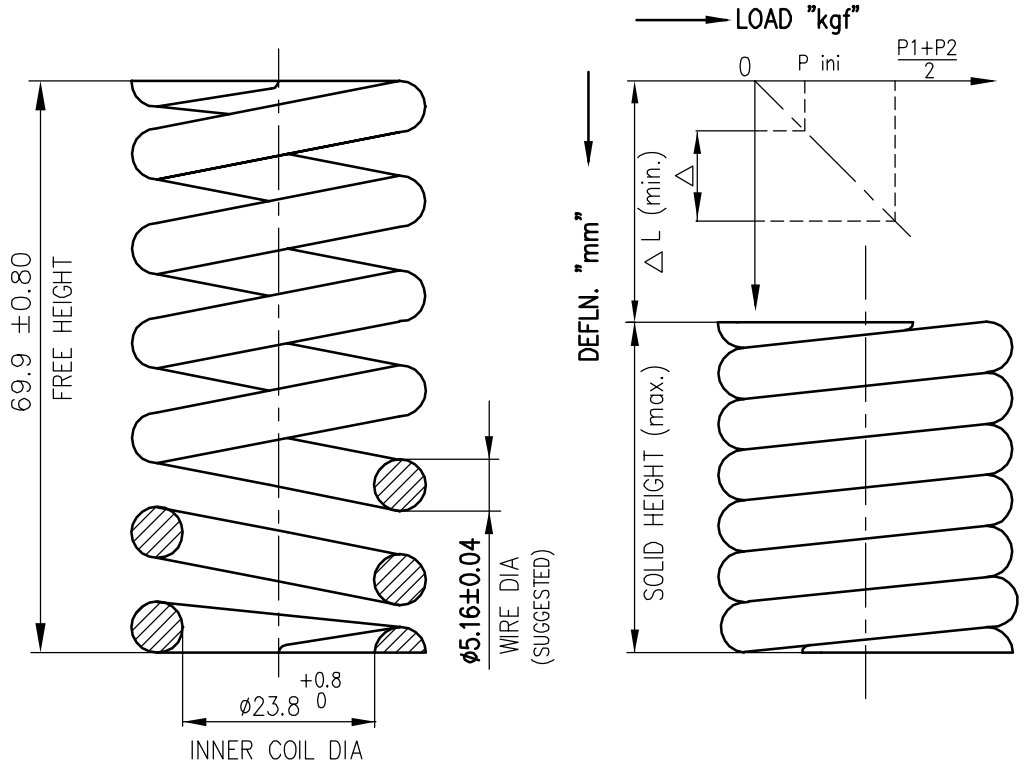

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300230	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	4.732
04	SOLID DEFLECTION △L min.		mm	$28.4^{+2.4}_{-0.0}$
05	INITIAL LOADING P ini		Kg	20.2
06	TEST DEFLECTION △		mm	19.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	109.6
		P_2 MAX.	Kg	119.0
08	TILT DEFLECTION		mm	24.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.2±0.25
10	SPRING WEIGHT	Kg	0.11
11	PITCH	mm	9.6±0.3
12	DEVELOPED LENGTH OF ROD	mm	661
13	RAW MATERIAL DIA x LENGTH	mm	ø5.2x980
14	RAW MATERIAL WEIGHT	Kg	0.16
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964150800000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

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4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	12.08.14	
	CHKD: S.M	12.08.14	
	APPD: E.A	12.08.14	

NOTES UPDATED
DCN.No.801682

REV.			
02	ALTD: G.V	01.07.08	
	CHKD: E.A	01.07.08	
	APPD: E.A	01.07.08	

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

BHEL 365-081

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		01.07.08
CHECKED	E.ATHIANNAVI		01.07.08
APPROVED	E.ATHIANNAVI		01.07

TITLE: SPRING

DRG No. 4-V-J023-21241 REV. 03

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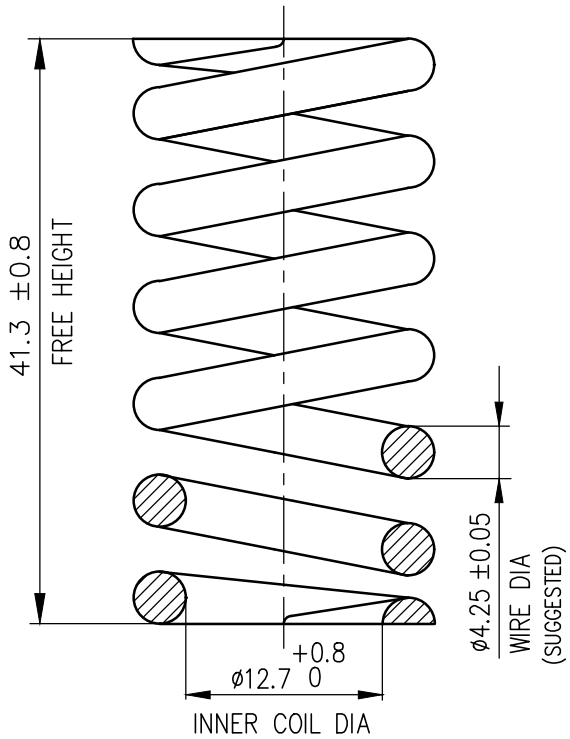

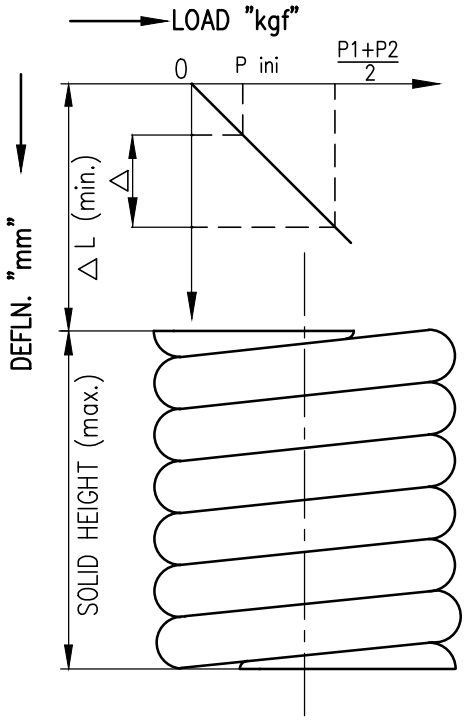

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000230	
02	OUTSIDE DIA MAX. LIMIT		(mm)	22.8
03	SPRING RATE (±4%)		(Kg/mm)	12.195
04	SOLID DEFLECTION △L min.		(mm)	10.0
05	INITIAL LOADING P_{ini}		(Kgs)	18.3
06	TEST DEFLECTION △		(mm)	7.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	99.5
		P_2 MAX.	(Kgs)	108.0
08	TILT DEFLECTION		(mm)	8.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.6 ±0.25
10	SPRING WEIGHT	(Kgs)	0.039
11	PITCH	(mm)	5.9 ±0.3
12	DEVELOPED LENGTH OF ROD	(mm)	351
13	SPRING CODE	964151730000/ 974425210000	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE, OUTSIDE DIA & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
02	ALTD: A.P	06.02.16	01	ALTD: G.V	20.08.14
	CHKD: S.M	06.02.16		CHKD: S.M	20.08.14
	APPD: E.A	06.02.16		APPD: E.A	20.08.14

OUTSIDE DIA MAX. LIMIT & NOTES REVISED

DCP.NO.802077 Dt. 06-02-2016

NOTES UPDATED
DCN.No.801682

BHEL 365-081

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		16.11.05
CHECKED	E.ATHIANNAVI		16.
APPROVED	E.ATHIANNAVI		16.

TITLE: SPRING

DRG No. 4-V-J023-21750 REV. 02

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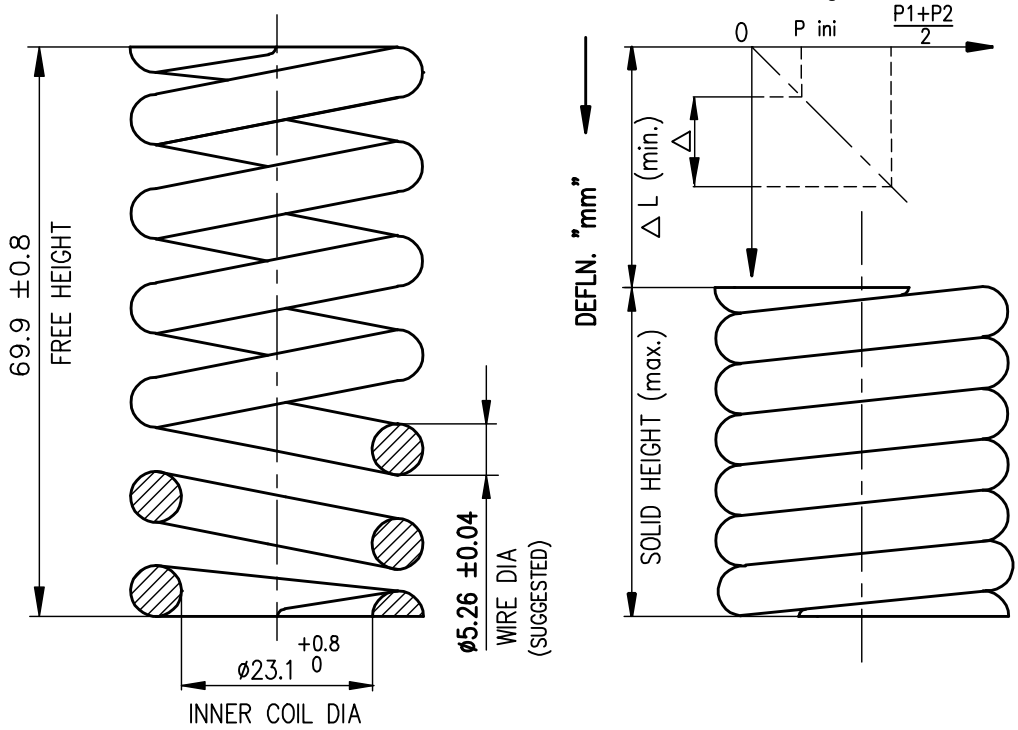

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300240	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	5.410
04	AVERAGE DEFLECTION △L min.		mm	28.0
05	INITIAL LOADING P_{ini}		Kg	22.7
06	TEST DEFLECTION △		mm	19.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	123.5
		P_2 MAX.	Kg	134.2
08	TILT DEFLECTION		mm	23.8.

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.3 ±0.25
10	SPRING WEIGHT	Kg	0.1
11	PITCH	mm	9.4 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	653
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964151710000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.	
02	ALTD:	01	ALTD: G.V 24.09.08
	CHKD:		CHKD: E.A 24.09.08
	APPD:		APPD: E.A 24.09.08

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		24.09.08
CHECKED	E.ATHIANNAVI		24.09.08
APPROVED	E.ATHIANNAVI		24.09.08

TITLE: SPRING

DRG No. 4-V-J024-21549 REV. 01

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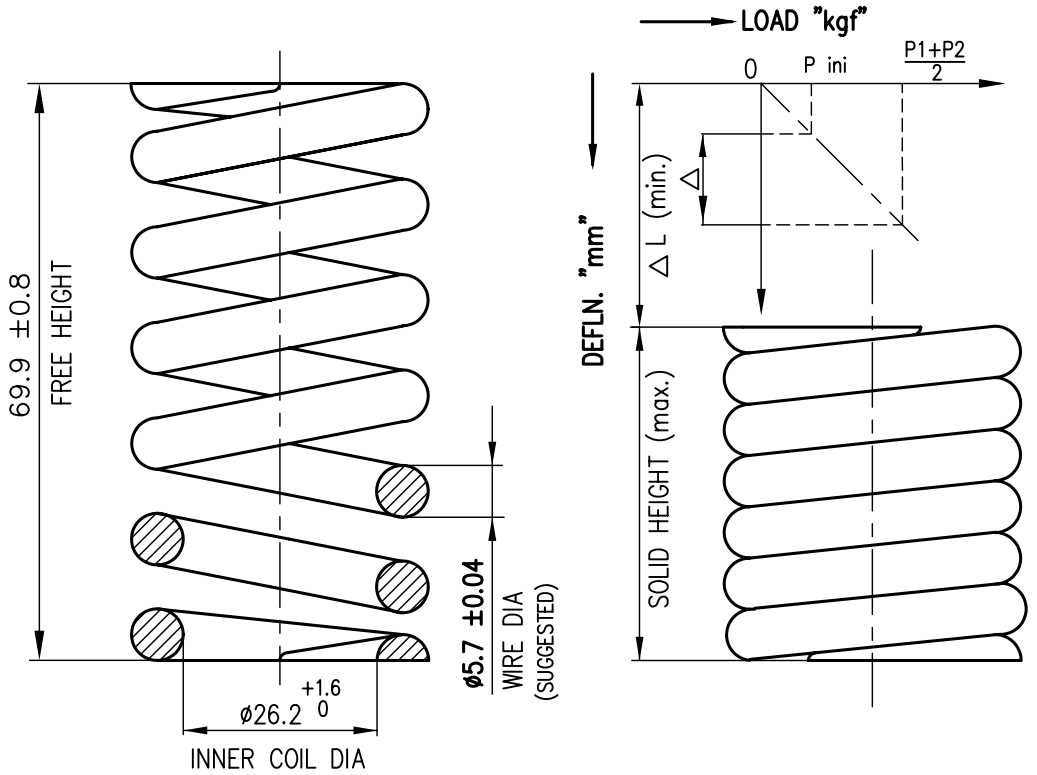

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100240	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	5.910
04	AVERAGE DEFLECTION △L min.		mm	28.4
05	INITIAL LOADING P ini		Kg	25.2
06	TEST DEFLECTION △		mm	19.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	136.6
		P_2 MAX.	Kg	148.4
08	TILT DEFLECTION		mm	24.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.6 ±0.25
10	SPRING WEIGHT	Kg	0.13
11	PITCH	mm	10.5 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	661
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964150880000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.					
02	ALTD:	REV. 01	ALTD: G.V	17.12.08	
	CHKD:		CHKD: E.A	17.12.08	
	APPD:		APPD: E.A	17.12.08	

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		17.12.08
CHECKED	E.ATHIANNAVI		17.12.08
APPROVED	E.ATHIANNAVI		17.12.0

TITLE: SPRING

DRG No. 4-V-J024-21598 REV. 01

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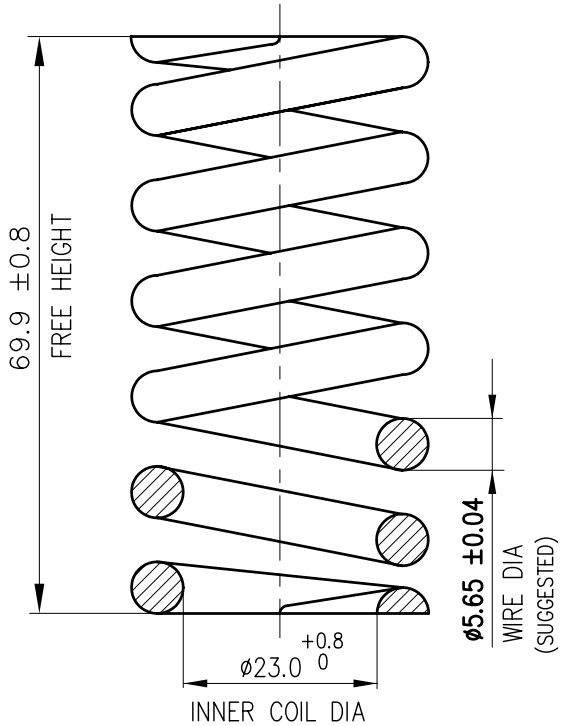

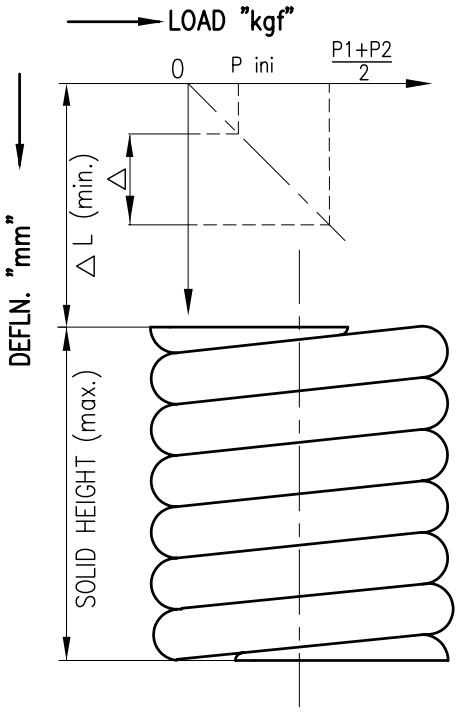

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300250	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	6.321
04	AVERAGE DEFLECTION △L min.		mm	20.3
05	INITIAL LOADING P ini		Kg	19.3
06	TEST DEFLECTION △		mm	14.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	104.7
		P_2 MAX.	Kg	113.7
08	TILT DEFLECTION		mm	17.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.9 ±0.25
10	SPRING WEIGHT	Kg	0.1
11	PITCH	mm	8.5 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	716
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.			NAME	SIGN	DATE
02	ALTD:	01	ALTD: G.V	02.06.10	DRAWN: MRC		10.04.95
	CHKD:		CHKD: S.M	02.06.10	CHECKED: KSR		10.04.95
	APPD:		APPD: E.A	02.06.10	APPROVED: VM		10.04.

DRAWING UPDATED AND REDRAWN IN CAD DCP.No.801027

TITLE: SPRING

DRG No. 4-V-J025-21443 REV. 01

COMP. CODE: 964151160000

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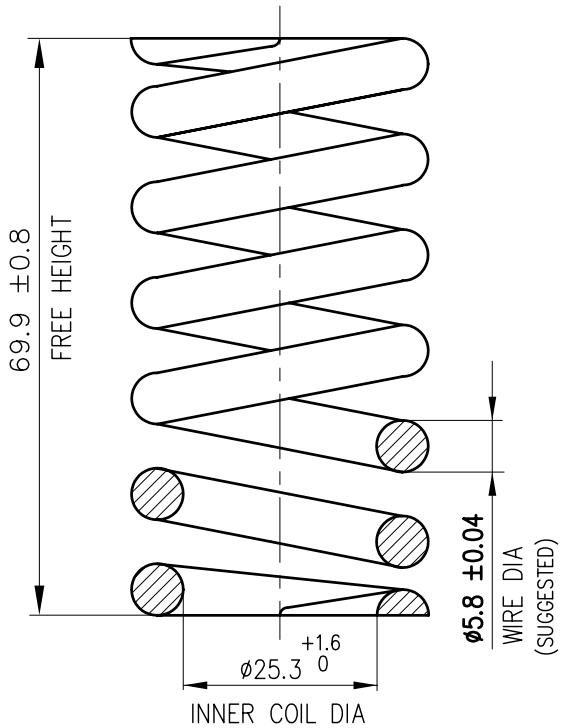

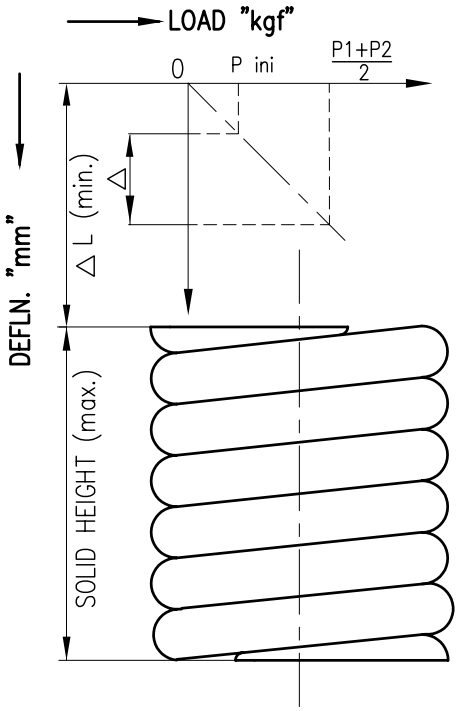

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100250	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	6.731
04	AVERAGE DEFLECTION △L min.		mm	27.5
05	INITIAL LOADING P ini		Kg	27.7
06	TEST DEFLECTION △		mm	19.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	150.6
		P_2 MAX.	Kg	163.6
08	TILT DEFLECTION		mm	23.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.6 ±0.25
10	SPRING WEIGHT	Kg	0.14
11	PITCH	mm	10.3 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	653
13	RAW MATERIAL DIA x LENGTH	mm	ø5.8x1150
14	RAW MATERIAL WEIGHT	Kg	0.24
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964151120000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.					
02	ALTD:	REV. 01	ALTD: G.V	05.11.09	
	CHKD:		CHKD: E.A	05.11.09	
	APPD:		APPD: E.A	05.11.09	

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800903 DT.21.01.09

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		05.11.09
CHECKED	E.ATHIANNAVI		05.11.09
APPROVED	E.ATHIANNAVI		05.11.0

TITLE: SPRING

DRG No. 4-V-J025-21599 REV. 01

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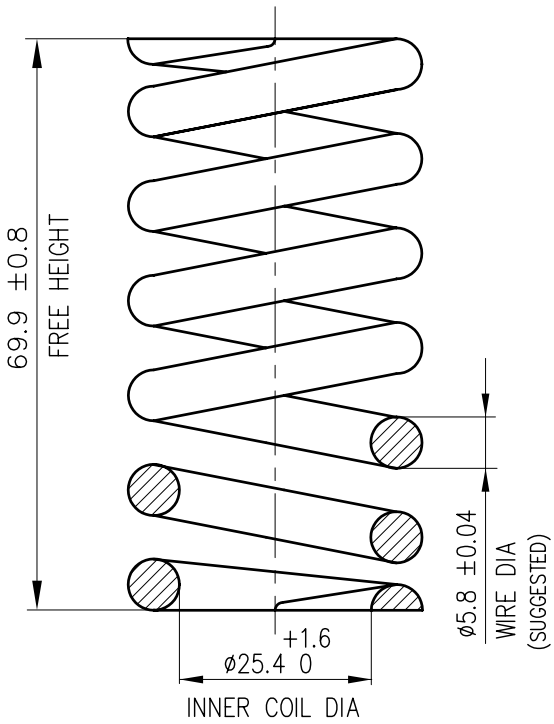

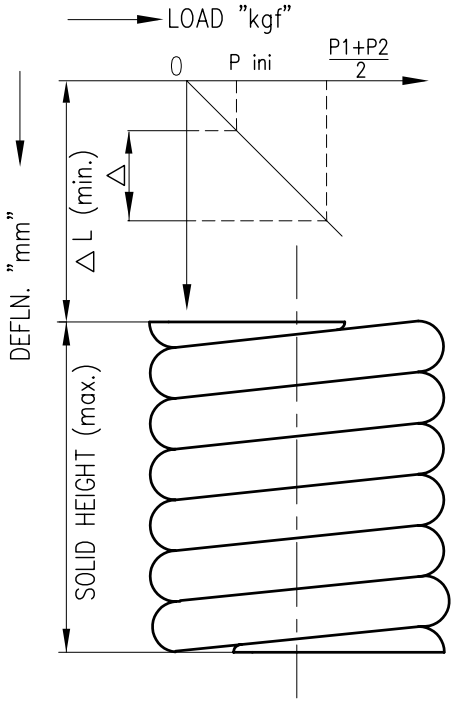

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100250CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	38.1
03	SPRING RATE		(Kg/mm)	6.731
04	AVERAGE DEFLECTION △L min.		(mm)	27.5
05	INITIAL LOADING P ini		(Kgs)	27.7
06	TEST DEFLECTION △		(mm)	19.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	150.6
		P_2 MAX.	(Kgs)	163.6
08	TILT DEFLECTION		(mm)	23.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.6\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.125
11	PITCH	(mm)	11.4 ±0.4
12	DEVELOPED LENGTH OF ROD	(mm)	603
13	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 12 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.					
02	ALTD:	REV. 01	ALTD: G.V	28.12.10	
	CHKD:		CHKD: S.M	28.12.10	
	APPD:		APPD: E.A	28.12.10	

NOTE-3 MODIFIED
DCP.No.801041

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		16.10.09
CHECKED	S.Madhulingam		16.10.09
APPROVED	E.Athiannavi		16.10

TITLE: SPRING

DRG No. 4-V-J025-23788 REV. 01

COMP. CODE: 974627950900/964159710900

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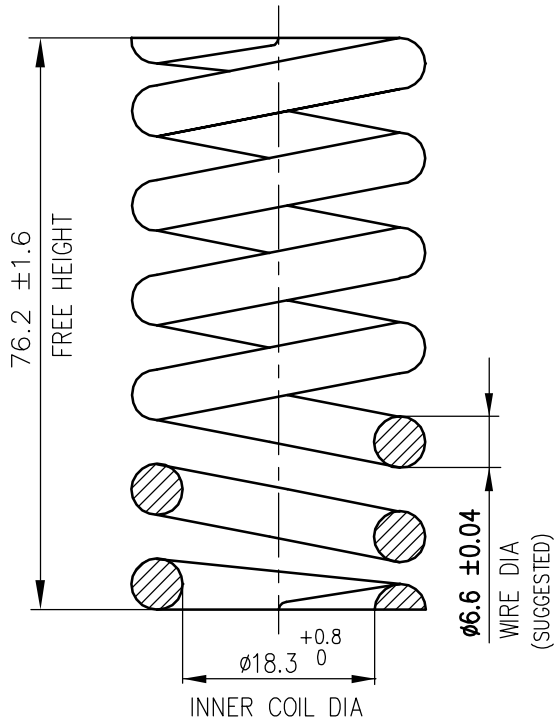

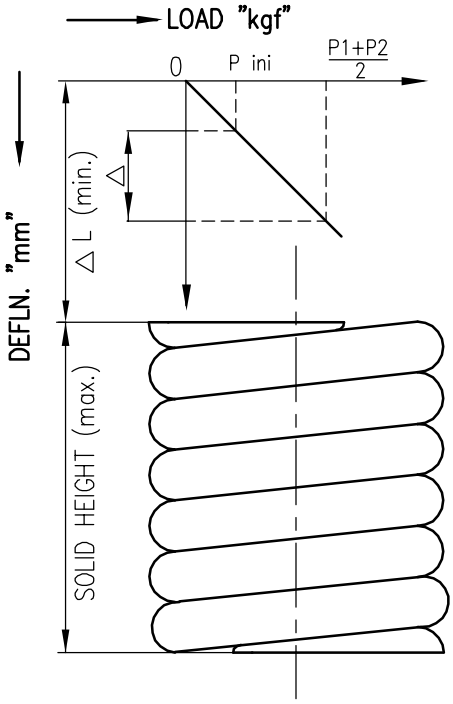

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1100270	
02	OUTSIDE DIA MAX. LIMIT		mm	34.9
03	SPRING RATE (±4%)		Kg/mm	17.855
04	SOLID DEFLECTION △L min.		mm	$16.0^{+2.4}_{-0.0}$
05	INITIAL LOADING P ini		Kg	42.7
06	TEST DEFLECTION △		mm	11.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	232.1
		P_2 MAX.	Kg	252.1
08	TILT DEFLECTION		mm	13.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.0 ±0.25
10	SPRING WEIGHT	Kg	0.17
11	PITCH	mm	9.1 ±0.6
12	DEVELOPED LENGTH OF ROD	mm	627
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964153180000/ 974626240000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	22.08.14	
	CHKD: S.M	22.08.14	
	APPD: E.A	22.08.14	
01	ALTD: MRC	24.04.97	
	CHKD: KSR	24.04.97	
	APPD: KSR	24.04.97	

NOTES UPDATED
DCN.No.801682

RETRACED & UPDATED
DCN: SR: 0188

	NAME	SIGN	DATE
DRAWN	MRC		24.04.97
CHECKED	KSR		24.04.97
APPROVED	KSR		24.0

TITLE: SPRING

DRG No. 4-V-J027-21205 REV. 02

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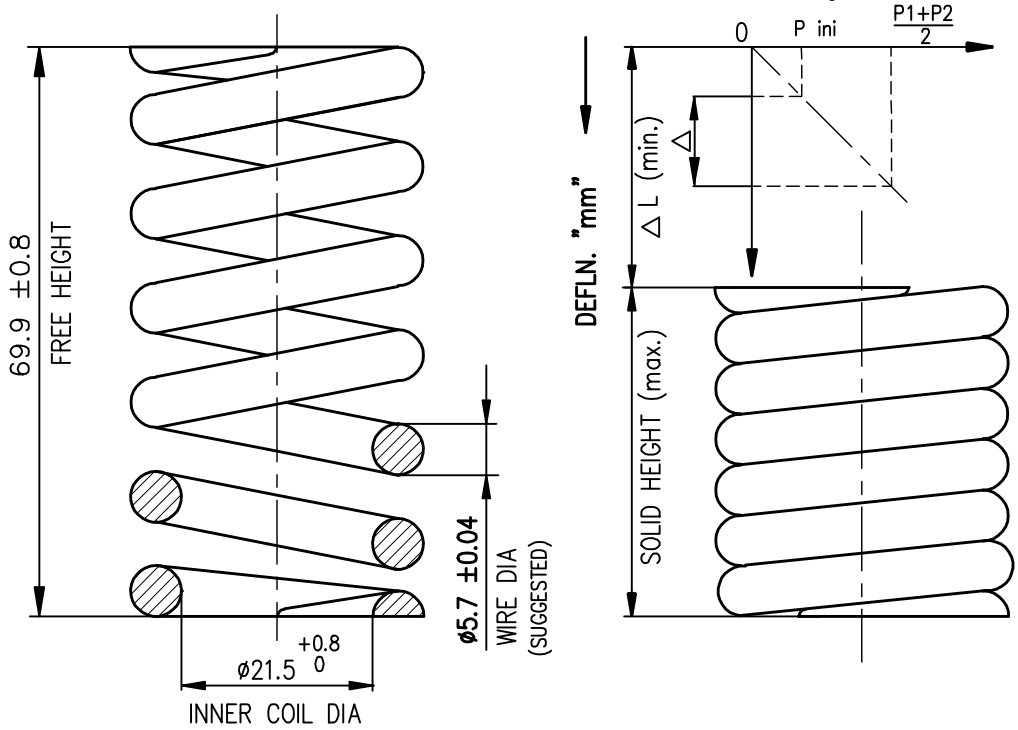

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100270	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	8.213
04	AVERAGE DEFLECTION △L min.		mm	22.4
05	INITIAL LOADING P_{ini}		Kg	27.5
06	TEST DEFLECTION △		mm	15.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	149.6
		P_2 MAX.	Kg	162.4
08	TILT DEFLECTION		mm	19.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.5 ±0.25
10	SPRING WEIGHT	Kg	0.14
11	PITCH	mm	9.1 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	688
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964153250000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS 4454 (Part-1) Gr.SM/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. PHOSPHATE COAT AS PER LATEST APPLICABLE QUALITY PROCEDURE.

REV.			REV.	
02	ALTD: G.V	29.06.09	01	ALTD: M.R.C
	CHKD: S.M	29.06.09		CHKD: K.S.R
	APPD: E.A	29.06.09		APPD: K.S.R
DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800903 Dt.21.01.09.			RETRACED & UPDATED DCN.NO.SR:0188 DT.24.04.97	

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		29.06.09
CHECKED	S.Madhulingam		29.06.09
APPROVED	E.Athiannavi		29.06.0

TITLE: SPRING

DRG No. 4-V-J027-21222 REV. 02

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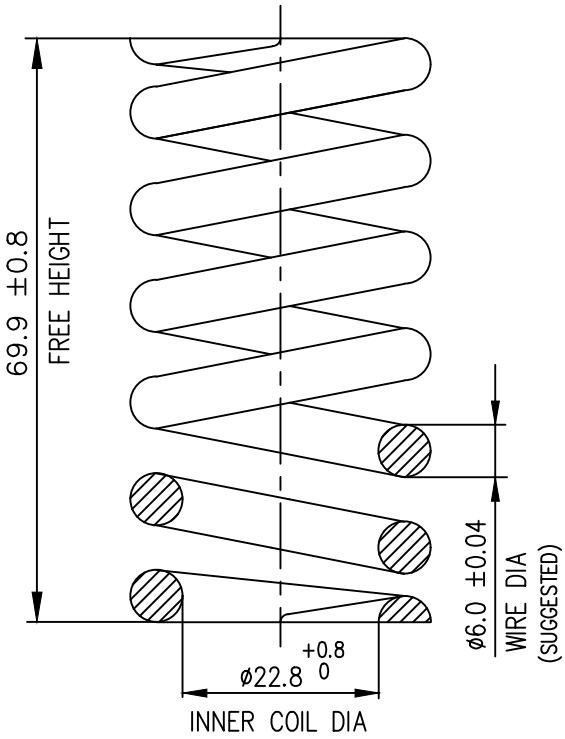

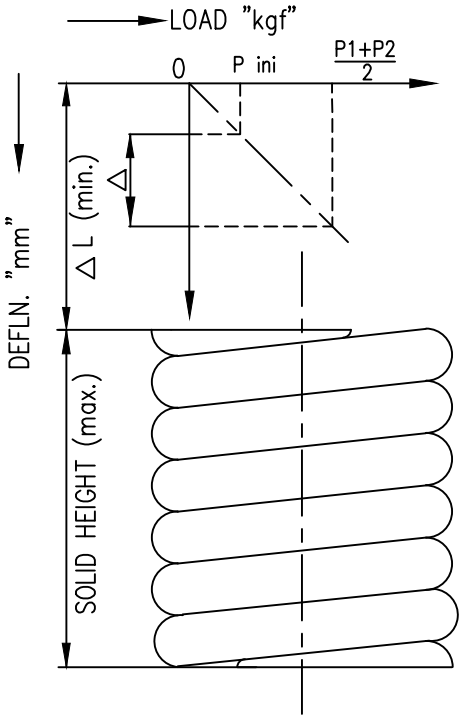

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0100280	
02	OUTSIDE DIA MAX. LIMIT		mm	38.1
03	SPRING RATE (±4%)		Kg/mm	8.945
04	SOLID DEFLECTION Δ L min.		mm	20.6
05	INITIAL LOADING P ini		Kg	27.6
06	TEST DEFLECTION Δ		mm	14.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	150.0
		P_2 MAX.	Kg	162.9
08	TILT DEFLECTION		mm	17.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.1 +0 −0.5
10	SPRING WEIGHT	Kg	0.14
11	PITCH	mm	9.5 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	647
13	SPRING CODE	964151270002	
14	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 & 12 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS 4454 GR.2/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. SPRING SHALL BE COATED WITH ZINC (OR) NICKEL PLATING.

REV.	ALTD:	REV.	ALTD:
05	CHKD:	04	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	J.Dhanabal		01.01.19
CHECKED	R.Rabin		01.[illegible]
APPROVED	S.Madhulingam		01.[illegible]

TITLE: SPRING

DRG No. 4-V-J028-21896 REV. 00

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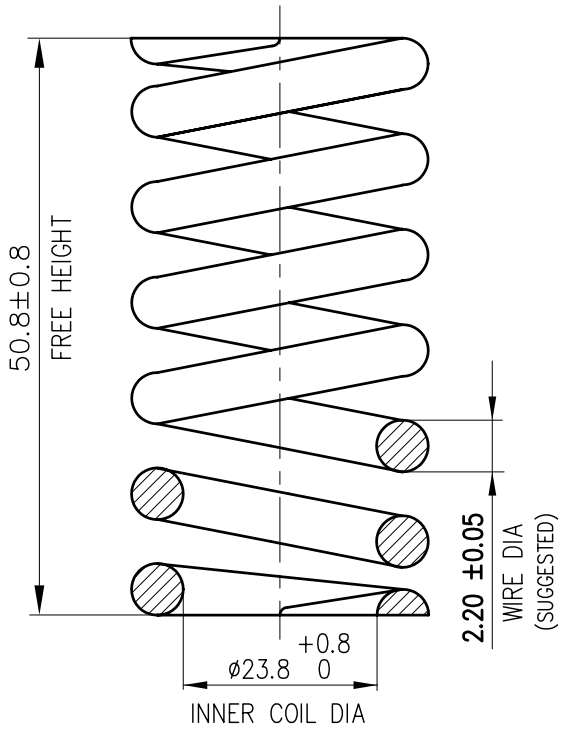

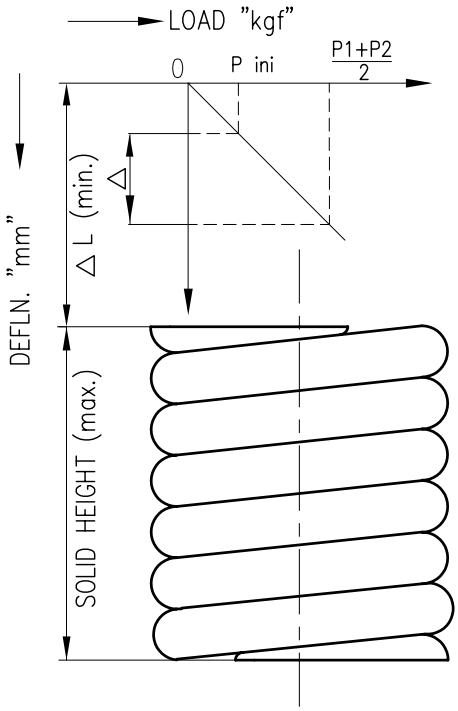

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0300840IX	
02	MAX. OUTSIDE DIA		(mm)	30.2
03	SPRING RATE		(Kg/mm)	0.1785
04	AVERAGE DEFLECTION △L min.		(mm)	31.8
05	INITIAL LOADING P ini		(Kgs)	0.86
06	TEST DEFLECTION △		(mm)	13.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	3.122
		P_2 MAX.	(Kgs)	3.362
08	TILT DEFLECTION		(mm)	27.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.9±1/4
10	SPRING WEIGHT	(Kgs)	0.02
11	PITCH	(mm)	6.9±0.3
12	DEVELOPED LENGTH OF ROD	(mm)	647.0
13	RAW MATERIAL LENGTH	(mm)	VENDOR TO DECIDE
14	RAW MATERIAL WEIGHT	(Kgs)	–
15	COATING	–	–
16	SPRING CODE	974622450000/ 964152610000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS: INCONEL X 750 (AMS 5699) TEST CERTIFICATE IS TO BE OBTAINED.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V 23.01.10	
	CHKD:		CHKD: VPP 23.01.10	
	APPD:		APPD: E.A 23.01.10	

96 CODE ADDED AND DRG. UPDATED
DCP. NO. 800993 DT.16.10.09

	NAME	SIGN	DATE
DRAWN	KPL		14-01-92
CHECKED	VPP		14-01-92
APPROVED	KN		17-01-

TITLE: SPRING

DRG No. 4-V-J084-21049 REV. 01

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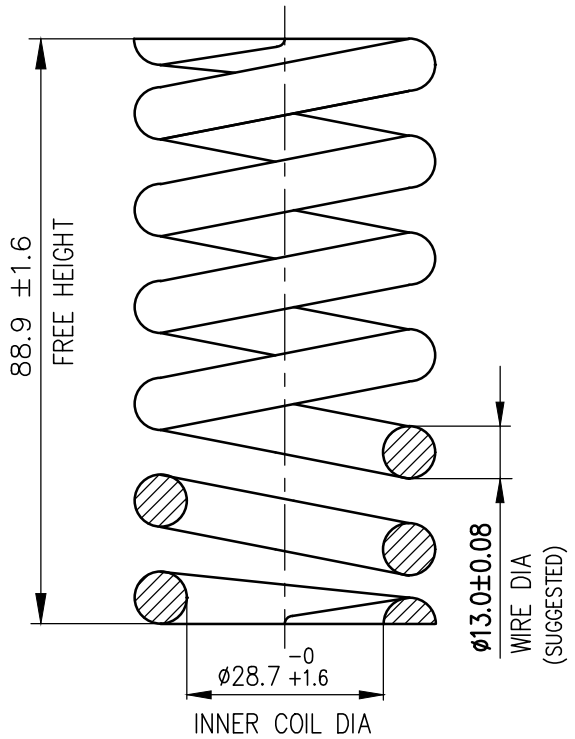

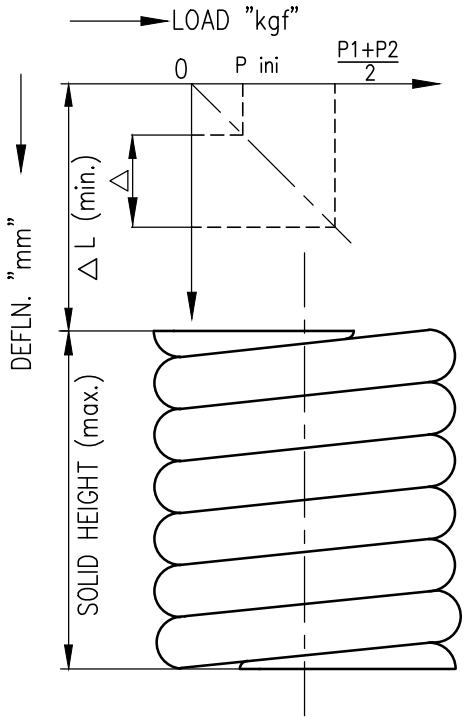

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000840IX	
02	OUTSIDE DIA MAX. LIMIT		(mm)	60.3
03	SPRING RATE (±4%)		(Kg/mm)	95.524
04	AVERAGE DEFLECTION △L min.		(mm)	15.9
05	INITIAL LOADING P_{ini}		(Kgs)	227.8
06	TEST DEFLECTION △		(mm)	11.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1238.1
		P_2 MAX.	(Kgs)	1343.9
08	TILT DEFLECTION		(mm)	13.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	4.18±0.25
10	SPRING WEIGHT	(Kgs)	0.78
11	PITCH	(mm)	16.7 ±0.8
12	DEVELOPED LENGTH OF ROD	748	
13	SPRING CODE	974626340000/ 964162100000	
14	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** APPLICATION.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A637 GR.688 TYPE 1–INCONEL X750/ ASTM B637–UNS NO.7750/INCONEL X750–AMS5699.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
02	ALTD: A.P	06.02.16	01	ALTD: G.V	16.02.13
	CHKD: S.M	06.02.16		CHKD: S.M	16.02.13
	APPD: E.A	06.02.16		APPD: E.A	16.02.13

DIMENSIONS AND GIVEN VALUE UPDATED

DCP.NO.802077 Dt. 06–02–2016

DRAWING UPDATED
DCP.No.801440

365–081

	NAME	SIGN	DATE
DRAWN	MRC		30.01.96
CHECKED	KSR		30.(
APPROVED	KSR		30.(

TITLE: SPRING

DRG No. 4–V–J084–21524 REV. 02

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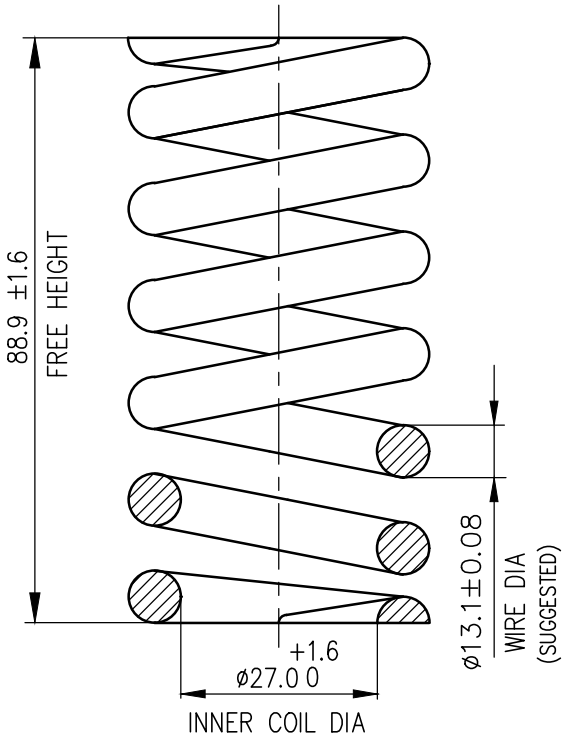

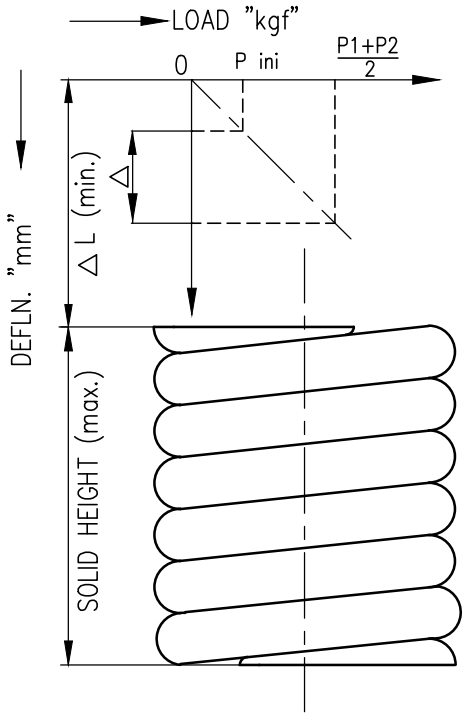

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000850IX	
02	OUTSIDE DIA MAX. LIMIT		(mm)	60.3
03	SPRING RATE (±4%)		(Kg/mm)	109.808
04	SOLID DEFLECTION △L min.		(mm)	13.3
05	INITIAL LOADING P_{ini}		(Kgs)	219.1
06	TEST DEFLECTION △		(mm)	9.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1190.5
		P_2 MAX.	(Kgs)	1292.3
08	TILT DEFLECTION		(mm)	11.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	4.2±0.25
10	SPRING WEIGHT	(Kgs)	0.76
11	PITCH	(mm)	16.5±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	725
13	SPRING CODE	974611520000	
14	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE,OUTSIDE DIA MAX LIMIT & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A637 GR.688 TYPE 1–INCONEL X750/ ASTM B637–UNS NO.7750.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

		NAME	SIGN	DATE
365–081	DRAWN	A.P		25.07.17
	CHECKED	R.R		25.07.17
	APPROVED	E.A		25.07.17

TITLE: SPRING

DRG No. 4–V–J085–21859 REV. 00

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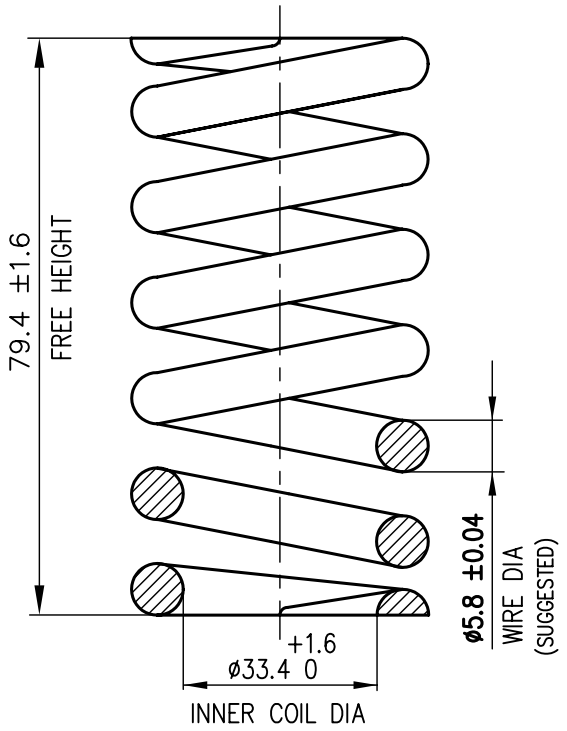

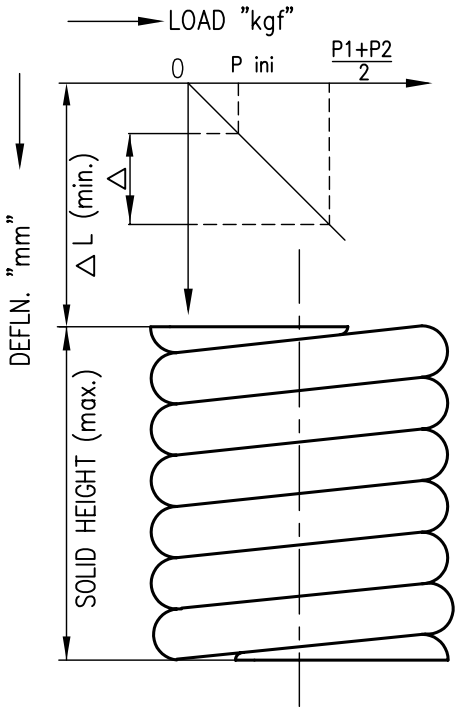

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101080CR	
02	MAX. OUTSIDE DIA		(mm)	50.8
03	SPRING RATE		(Kg/mm)	3.232
04	AVERAGE DEFLECTION △L min.		(mm)	37.3
05	INITIAL LOADING P ini		(Kgs)	18.1
06	TEST DEFLECTION △		(mm)	26.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	98.3
		P_2 MAX.	(Kgs)	106.8
08	TILT DEFLECTION		(mm)	31.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.9^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.16
11	PITCH	(mm)	12.6 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	788
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974627330900/ 964158400900	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.		REV.	
02	ALTD:	01	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		09.02.09
CHECKED	E.Athiannavi		09.02.09
APPROVED	E.Athiannavi		09.02.0

TITLE: SPRING

DRG No. 4-V-J108-23694 REV. 00

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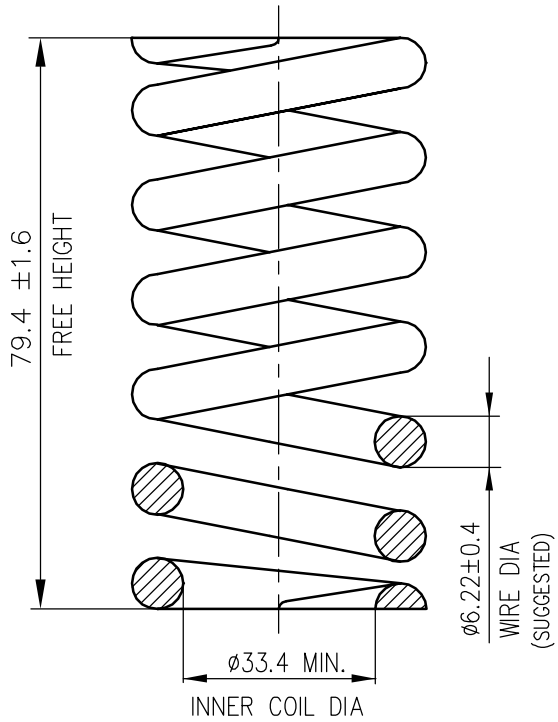

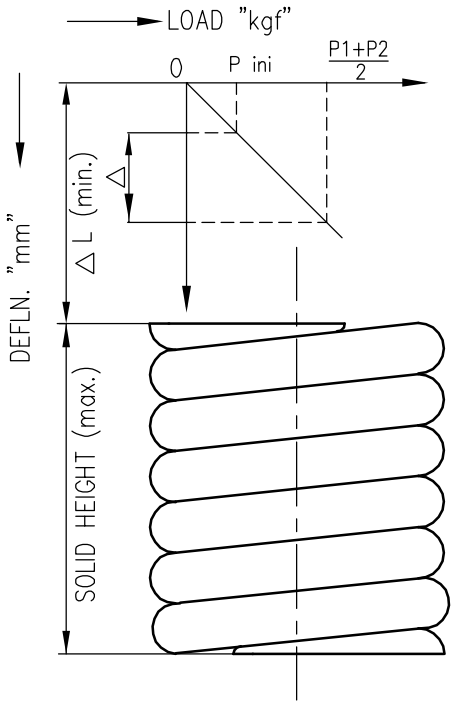

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101100CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	50.8
03	SPRING RATE		(Kg/mm)	4.303
04	AVERAGE DEFLECTION △L min.		(mm)	33.8
05	INITIAL LOADING P ini		(Kgs)	21.8
06	TEST DEFLECTION △		(mm)	23.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	118.5
		P_2 MAX.	(Kgs)	128.7
08	TILT DEFLECTION		(mm)	28.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.18
11	PITCH	(mm)	12.9 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	773
13	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 12 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: G.V	18.03.12
	CHKD:		CHKD: S.M	18.03.12
	APPD:		APPD: E.A	18.03.12

NOTES UPDATED
DCN.No.801269 Dt.04.01.12

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		23.07.11
CHECKED	S.Madhulingam		23.07.11
APPROVED	E.Athiannavi		23.07

TITLE
SPRING

DRG No. 4-V-J110-23497 REV. 01

COMP. CODE: 974626280900/964161530900

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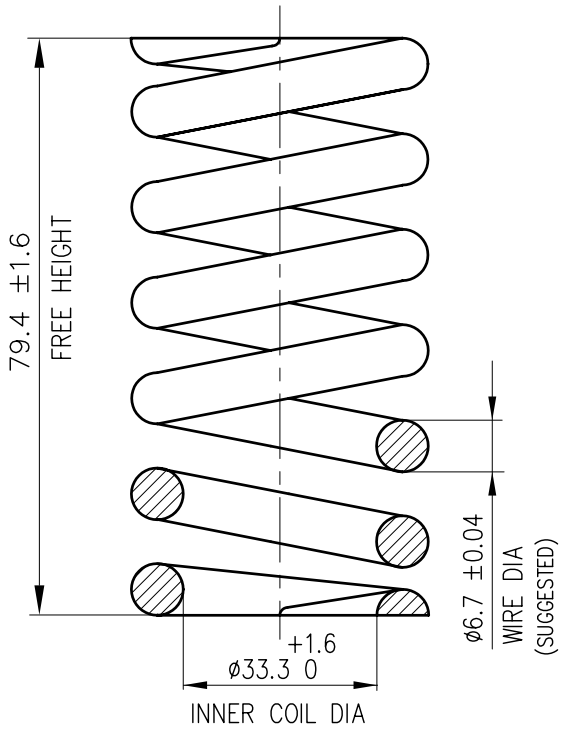

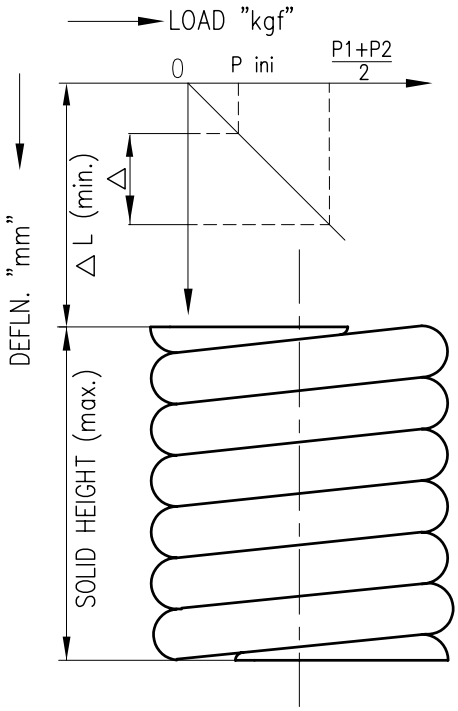

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101120CR	
02	MAX. OUTSIDE DIA		(mm)	50.8
03	SPRING RATE		(Kg/mm)	5.589
04	AVERAGE DEFLECTION △L min.		(mm)	31.6
05	INITIAL LOADING Pini		(Kgs)	26.5
06	TEST DEFLECTION △		(mm)	22.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	143.9
		P_2 MAX.	(Kgs)	156.3
08	TILT DEFLECTION		(mm)	26.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.217
11	PITCH	(mm)	12.7 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	783
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.					
02	ALTD:	01	ALTD: G.V	31.05.10	DRAWN	G.Venkateshwaralu	11.07.09
	CHKD:		CHKD: S.M	31.05.10	CHECKED	S.Madhulingam	11.07.09
	APPD:		APPD: E.A	31.05.10	APPROVED	E.Athiannavi	11.07.0

NAME | SIGN | DATE

NOTES UPDATED
DCN.No.801041

TITLE: SPRING

DRG No. 4-V-J112-23521 REV. 01

COMP. CODE: 974626330900/964158450900

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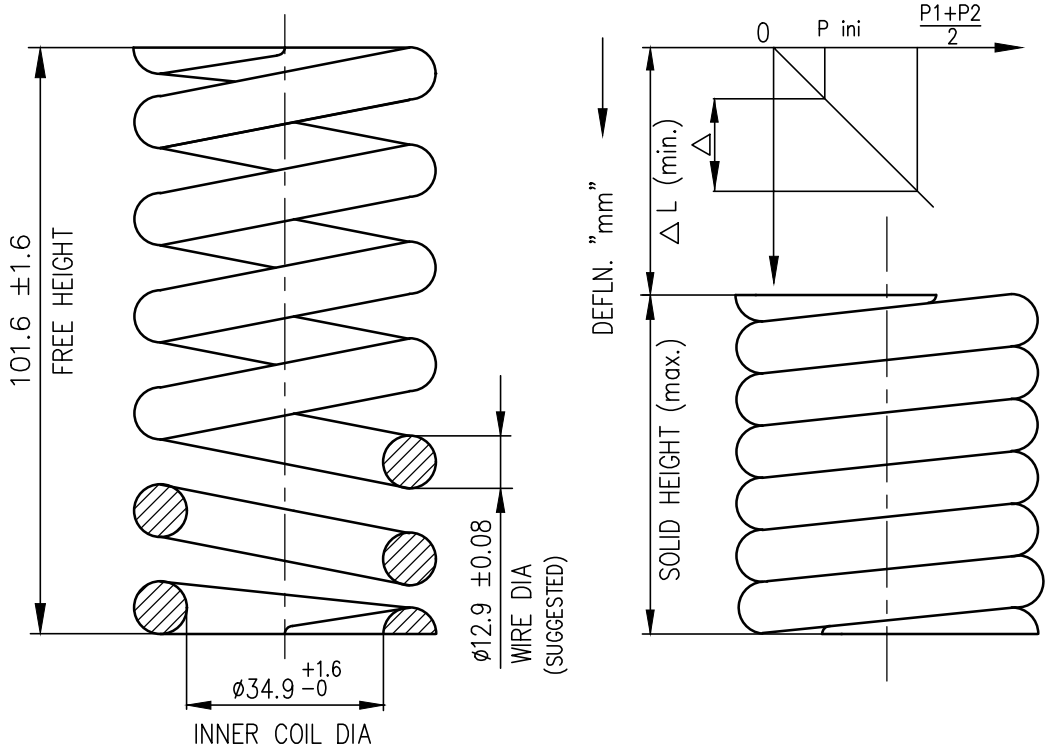

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1701140CR	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	53.207
04	AVERAGE DEFLECTION Δ L min.		(mm)	24.7
05	INITIAL LOADING P ini		(Kgs)	197.1
06	TEST DEFLECTION Δ		(mm)	17.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1071.3
		P_2 MAX.	(Kgs)	1162.9
08	TILT DEFLECTION		(mm)	21.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.8^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.91
11	PITCH	(mm)	$18.7^{\pm 0.7}$
12	DEVELOPED LENGTH OF ROD	(mm)	–
13	RAW MATERIAL DIA x LENGTH	(mm)	–
14	RAW MATERIAL WEIGHT	(Kgs)	–
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974611490000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322–6150/5160, A304–5160H/6150H/4161H, A401, A231
   BS970 Pt2–735A51/735H51, BS2803–735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270–2/IS4454–2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	PARAMASIVAM.A		08.05.2017
CHECKED	RABIN.R		08.05.2
APPROVED	ATHIANNVI.E		08.05.2

भारत हैवी इलेक्ट्रिकल्स लिमिटेड BHEL 365–081

TITLE: SPRING

DRG No. 4–V–J114–21857 REV. 00

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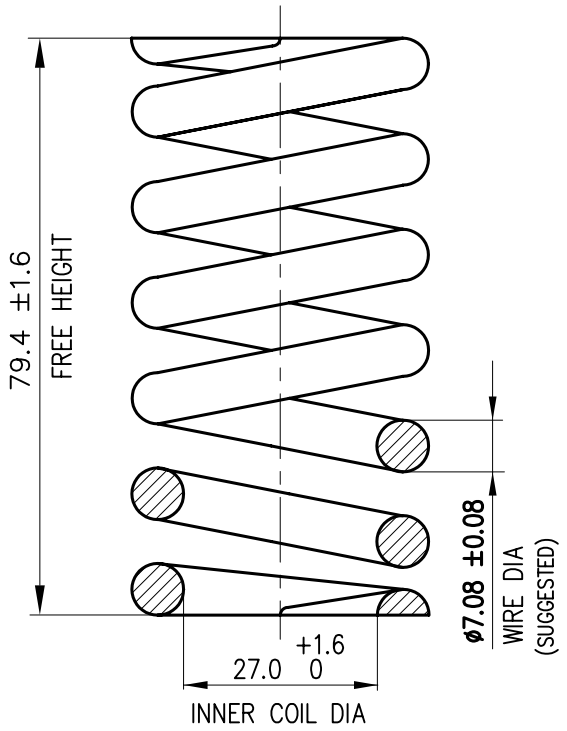

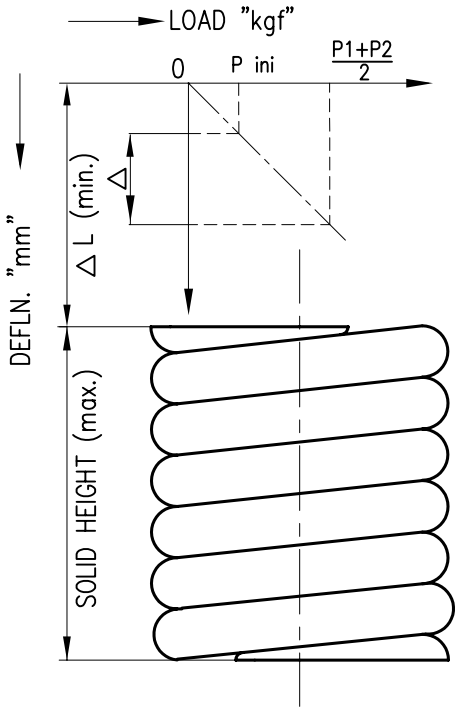

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0101180CR**	
02	MAX. OUTSIDE DIA		(mm)	50.8
03	SPRING RATE		(Kg/mm)	10.784
04	AVERAGE DEFLECTION Δ L min.		(mm)	27.6
05	INITIAL LOADING P ini		(Kgs)	44.7
06	TEST DEFLECTION Δ		(mm)	19.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	242.9
		P_2 MAX.	(Kgs)	263.8
08	TILT DEFLECTION		(mm)	23.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.0^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.214
11	PITCH	(mm)	12.0 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	693
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974623310000/ 964156920000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.	
03	ALTD:	02	ALTD: G.V 06.06.08
	CHKD:		CHKD: E.A 06.06.08
	APPD:		APPD: E.A 06.06.08

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		06.06.08
CHECKED	E.Athiannavi		06.06.08
APPROVED	E.Athiannavi		06.06.

TITLE: SPRING

DRG No. 4-V-J118-21276 REV. 02

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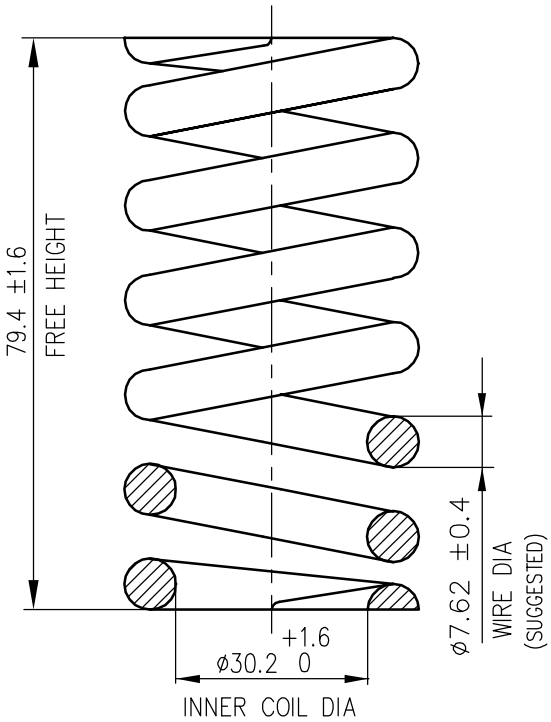

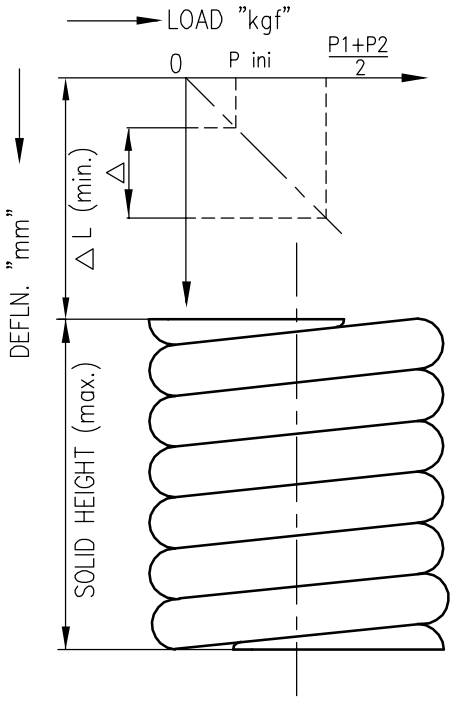

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101190CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	50.8
03	SPRING RATE (±4%)		(Kg/mm)	12.159
04	SOLID DEFLECTION △L min.		(mm)	$27.5^{+2.4}_{-0}$
05	INITIAL LOADING P_{ini}		(Kgs)	50.1
06	TEST DEFLECTION △		(mm)	19.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	272.1
		P_2 MAX.	(Kgs)	295.5
08	TILT DEFLECTION		(mm)	23.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.0-0.5^{0}$
10	SPRING WEIGHT	(Kgs)	0.25
11	PITCH	(mm)	13.5±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	686
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974627220000/ 964162150000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401, A231
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.			NAME	SIGN	DATE
02	ALTD:	01	ALTD: G.V	04.05.13	DRAWN: A.Paramu		05.12.00
	CHKD:		CHKD: S.M	04.05.13	CHECKED: K.S.Raju		05.12.00
	APPD:		APPD: E.A	04.05.13	APPROVED: K.S.Raju		05.12

BHEL 365-081

DRAWING UPDATED
DCP.No.801440

TITLE: SPRING

DRG No. 4-V-J119-21681 REV. 01

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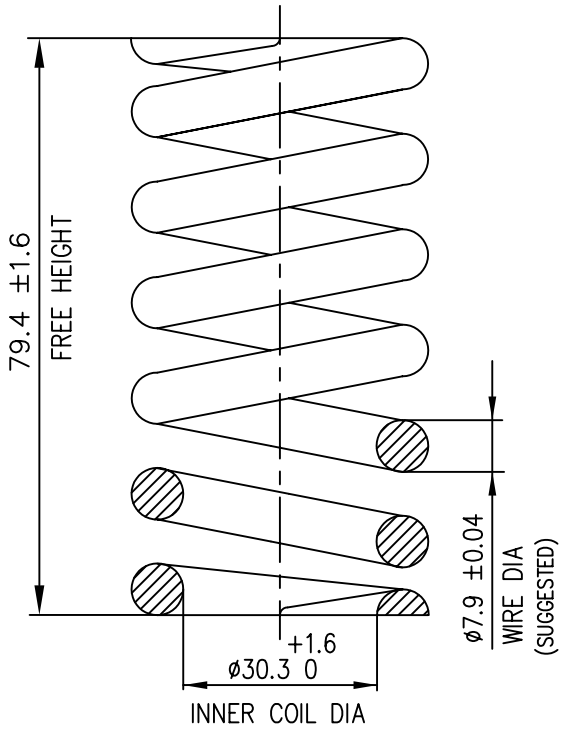

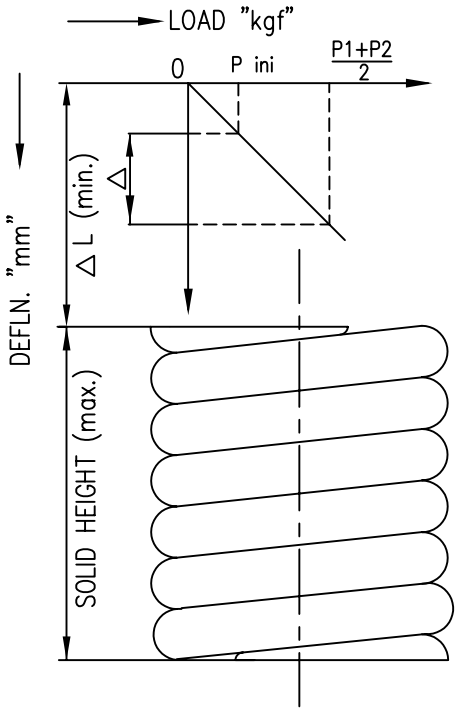

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101200CR	
02	MAX. OUTSIDE DIA		(mm)	50.8
03	SPRING RATE		(Kg/mm)	13.73
04	AVERAGE DEFLECTION Δ L min.		(mm)	27.2
05	INITIAL LOADING P ini		(Kgs)	56.0
06	TEST DEFLECTION Δ		(mm)	19.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	304.4
		P_2 MAX.	(Kgs)	330.6
08	TILT DEFLECTION		(mm)	23.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.2\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.265
11	PITCH	(mm)	13.5 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	688
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974624760000/ 964155340000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.	
03	ALTD: G.V	17.03.10	02	ALTD: MRC
	CHKD: S.M	17.03.10		CHKD: KSR
	APPD: E.A	17.03.10		APPD: KSR

DRAWING & CODE UPDATED
DCN.No.801027
DATED: 30.01.2010.

ALT.MATL. BS: 2803 735A50 ADDED.
DCN: SR: 0210 Dt.08.06.98

	NAME	SIGN	DATE
DRAWN	MRC		07.07.97
CHECKED	KSR		07.07.97
APPROVED	VM		07.07.9

TITLE: SPRING

DRG No. 4-V-J120-21249 REV. 03

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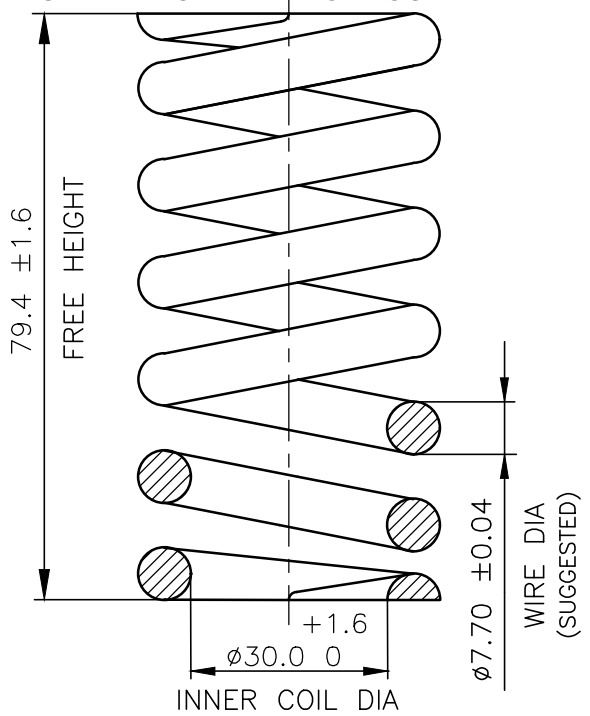
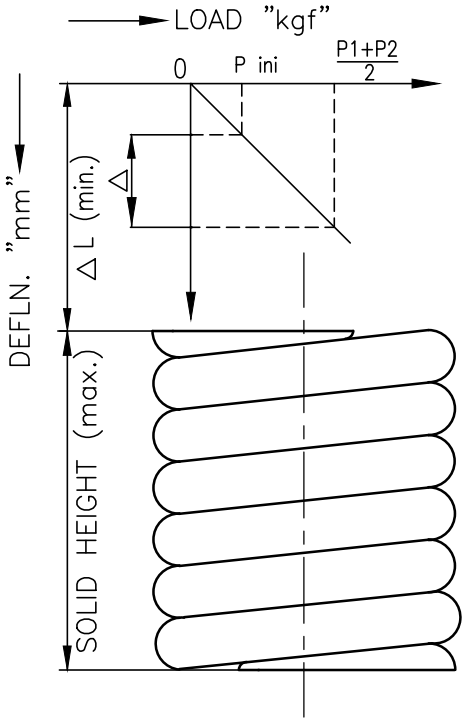
CORPORATE DRG ID:TP-DG-4-V-J120-21876/00





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0301200CR	
02	OUTSIDE DIA MAX.LIMIT		(mm)	50.8
03	SPRING RATE		(Kg/mm)	12.945
04	AVERAGE DEFLECTION Δ L min.		(mm)	27.3
05	INITIAL LOADING P_{ini}		(Kgs)	53.0
06	TEST DEFLECTION Δ		(mm)	19.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	288.1
		P_2 MAX.	(Kgs)	312.7
08	TILT DEFLECTION		(mm)	23.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	$5.1^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.3
11	PITCH	(mm)	13.7±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	796
13	SPRING CODE	964165190000	
14	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 12 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST** : ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.02	ALTD:	REV.01	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

भेल BHEL 365-081

	NAME	SIGN	DATE
DRAWN	J.Dhanabal		20.09.2018
CHECKED	R.Rabin		20.09.2
APPROVED	S.Madhulingam		20.09.2

TITLE: SPRING

DRG No. 4-V-J120-21876 REV. 00

COMP. CODE: 964165190000

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CORPORATE DRG ID:TP-DG-4-V-J120-21876/00

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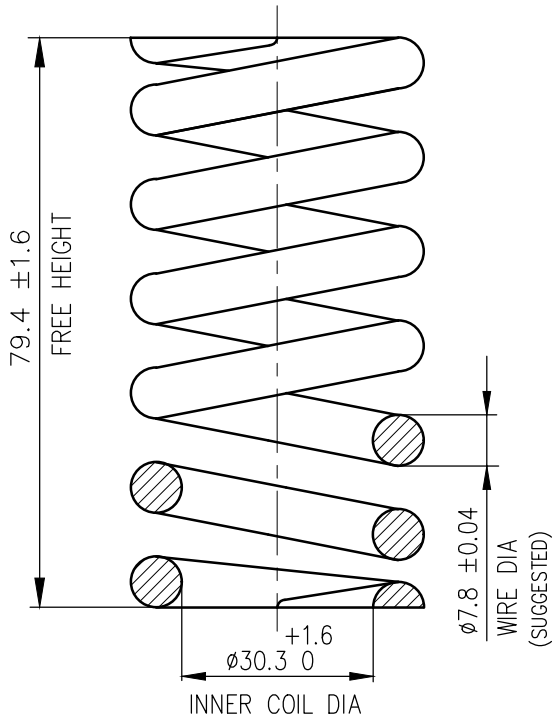

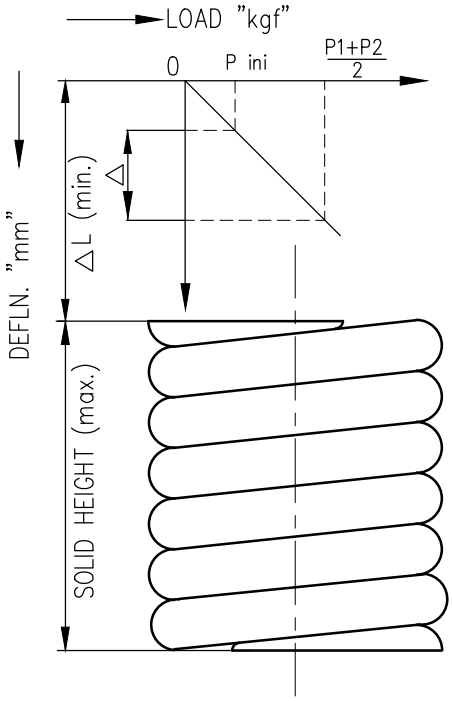

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101200NC	
02	OUTSIDE DIA MAX. LIMIT		(mm)	50.8
03	SPRING RATE		(Kg/mm)	13.73
04	AVERAGE DEFLECTION △L min.		(mm)	27.2
05	INITIAL LOADING Pini		(Kgs)	56.0
06	TEST DEFLECTION △		(mm)	19.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	304.4
		P_2 MAX.	(Kgs)	330.5
08	TILT DEFLECTION		(mm)	23.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.9\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.3
11	PITCH	(mm)	13.5 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	809
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964165740000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A564-631 (17-7 PH) HARDNESS 42 TO 46 HRC.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

365-081/A
08.09.2020

	NAME	SIGN	DATE
DRAWN	J.DHANABAL		07.07.2022
CHECKED	R.RABIN		07.07.2022
APPROVED	S.MADHULINGAM		07.07.20

TITLE: SPRING

DRG No. 4-V-J120-21912 REV. 00

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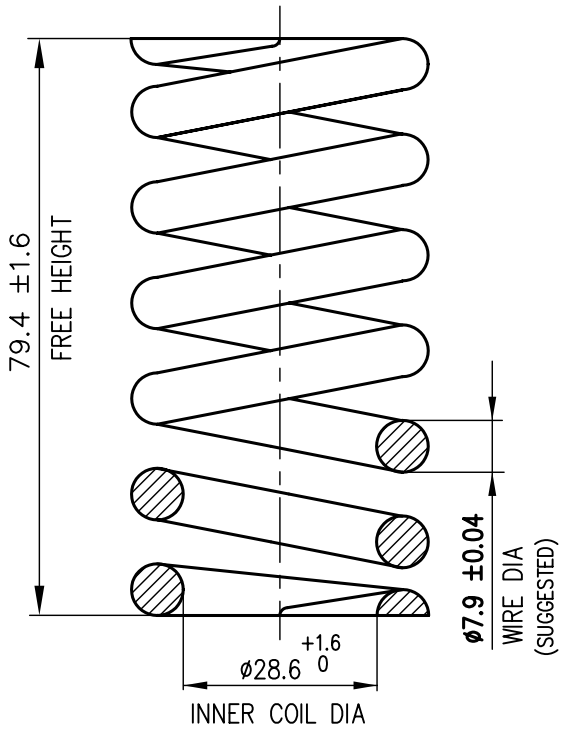

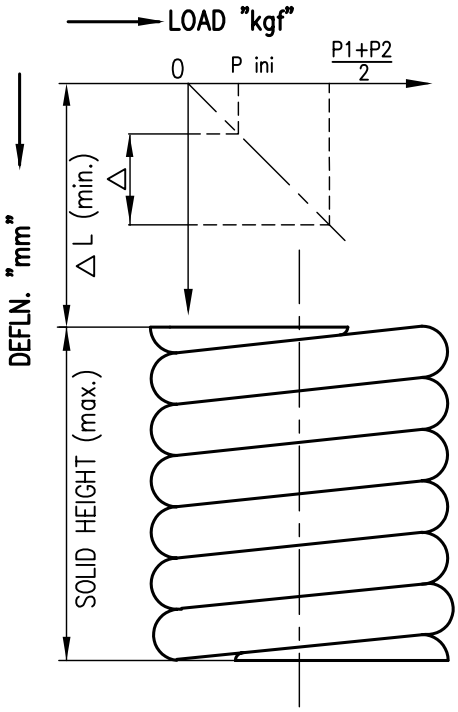

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101210CR	
02	MAX. OUTSIDE DIA		mm	50.8
03	SPRING RATE		Kg/mm	15.320
04	AVERAGE DEFLECTION △L min.		mm	27.0
05	INITIAL LOADING P ini		Kg	62.1
06	TEST DEFLECTION △		mm	18.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	337.4
		P_2 MAX.	Kg	366.4
08	TILT DEFLECTION		mm	23.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.3^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	0.26
11	PITCH	mm	13.2 ±0.7
12	DEVELOPED LENGTH OF ROD	mm	672
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974626480000/ 964153240000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	17.12.08	
	CHKD: E.A	17.12.08	
	APPD: E.A	17.12.08	
01	ALTD: MRC	07.07.97	
	CHKD: KSR	07.07.97	
	APPD: KSR	07.07.97	

DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800783 DT.07.01.08

RETRACED AND UPDATED DCN NO. SR:0189

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		17.12.08
CHECKED	E.ATHIANNAVI		17.12.08
APPROVED	E.ATHIANNAVI		17.12.0

TITLE: SPRING

DRG No. 4-V-J121-21220 REV. 02

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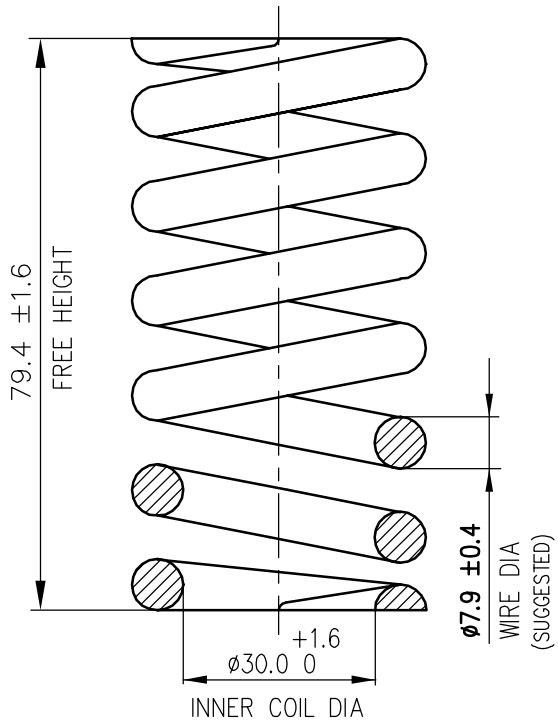

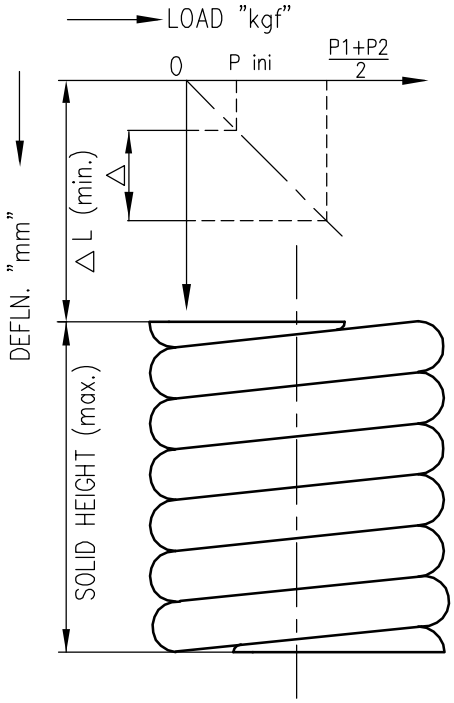

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0301210CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	50.8
03	SPRING RATE		(Kg/mm)	14.534
04	AVERAGE DEFLECTION △L min.		(mm)	27.1
05	INITIAL LOADING P ini		(Kgs)	59.1
06	TEST DEFLECTION △		(mm)	18.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	320.7
		P_2 MAX.	(Kgs)	348.3
08	TILT DEFLECTION		(mm)	23.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.0^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.302
11	PITCH	(mm)	14.0 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	784
13	SPRING CODE	974628920000 964161910000	
14	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 12 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		25.07.12
CHECKED	S.MADHULINGAM		25.07.12
APPROVED	E.ATHIANNAVI		25.07

TITLE: SPRING

DRG No. 4-V-J121-21818 REV. 00

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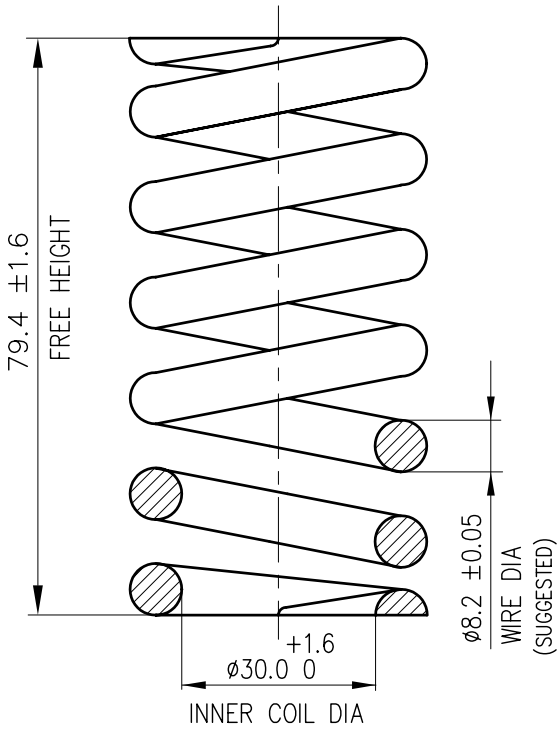

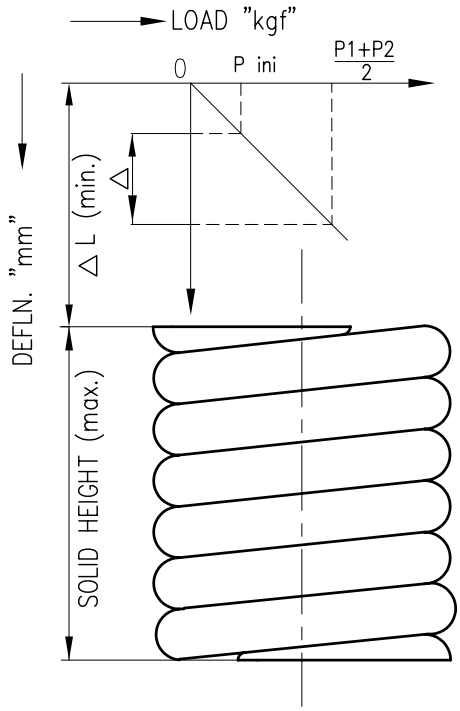

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101220CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	50.8
03	SPRING RATE		(Kg/mm)	16.962
04	AVERAGE DEFLECTION △L min.		(mm)	27.0
05	INITIAL LOADING P ini		(Kgs)	68.8
06	TEST DEFLECTION △		(mm)	18.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	373.6
		P_2 MAX.	(Kgs)	405.7
08	TILT DEFLECTION		(mm)	23.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.9^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.271
11	PITCH	(mm)	14.3 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	654
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 13 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		27.11.10
CHECKED	S.MADHULINGAM		27.11.10
APPROVED	E.ATHIANNAVI		27.11.1

TITLE: SPRING

DRG No. 4-V-J122-21799 REV. 00

COMP. CODE: 974628190000/964160780000

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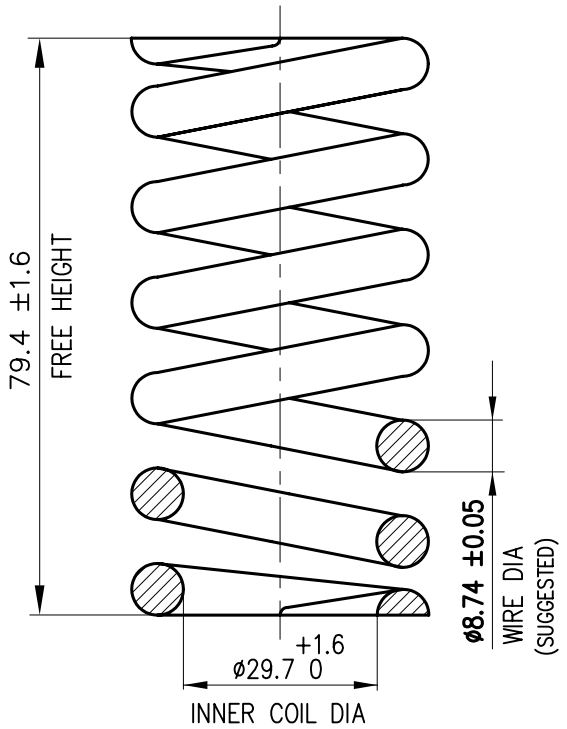

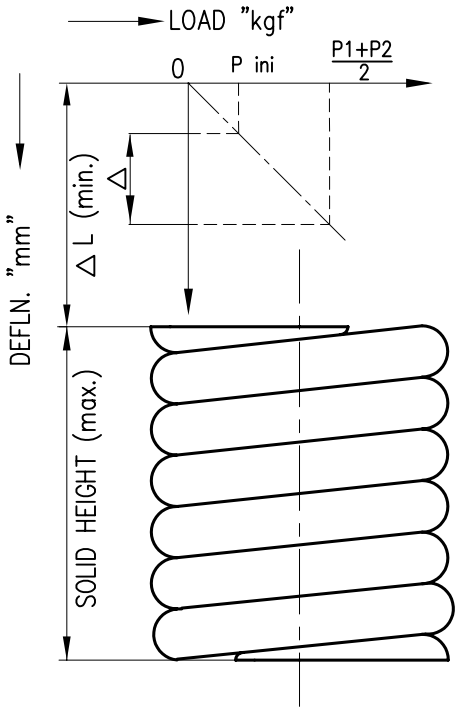

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101230CR	
02	MAX. OUTSIDE DIA		(mm)	50.8
03	SPRING RATE		(Kg/mm)	18.890
04	AVERAGE DEFLECTION Δ L min.		(mm)	19.9
05	INITIAL LOADING P ini		(Kgs)	56.3
06	TEST DEFLECTION Δ		(mm)	13.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	305.8
		P_2 MAX.	(Kgs)	332.1
08	TILT DEFLECTION		(mm)	16.9

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.5 $^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.344
11	PITCH	(mm)	12.3 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	731
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974625680000/ 964153230000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
02	ALTD: G.V	16.03.08		01	ALTD: MRC	07.07.97
	CHKD: E.A	16.03.08			CHKD: KSR	07.07.97
	APPD: E.A	16.03.08			APPD: KSR	07.07.97

DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800783 DT.07.01.08

RETRACED AND UPDATED DCN NO. SR:0189

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		16.03.08
CHECKED	E.Athiannavi		16.03.08
APPROVED	E.Athiannavi		16.03.0

TITLE: SPRING

DRG No. 4-V-J123-21218 REV. 02

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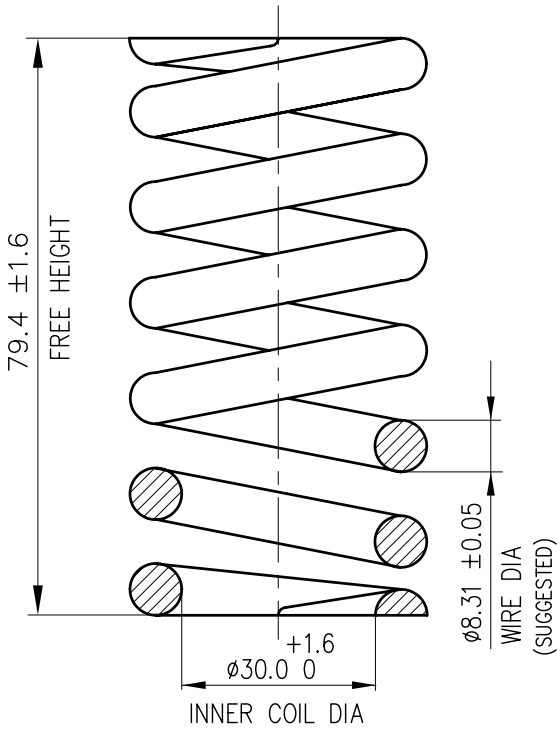

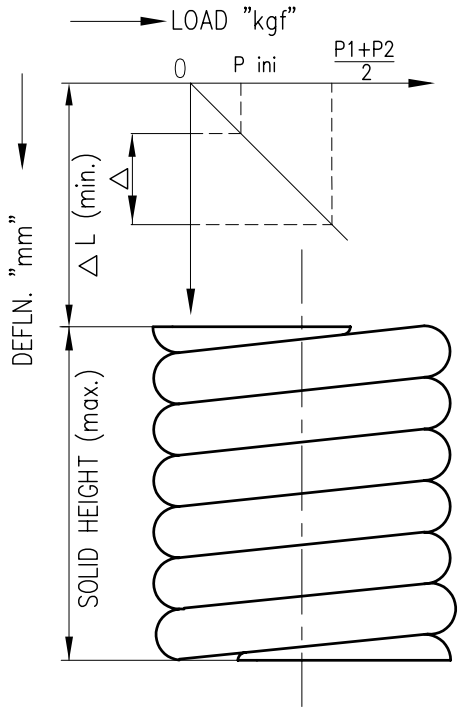

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0301230CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	50.8
03	SPRING RATE		(Kg/mm)	17.926
04	AVERAGE DEFLECTION △L min.		(mm)	26.7
05	INITIAL LOADING P ini		(Kgs)	71.9
06	TEST DEFLECTION △		(mm)	18.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	390.8
		P_2 MAX.	(Kgs)	424.3
08	TILT DEFLECTION		(mm)	22.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.277
11	PITCH	(mm)	14.4 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	650
13	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 13 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		24.11.10
CHECKED	S.MADHULINGAM		24.11.10
APPROVED	E.ATHIANNAVI		24.11.1

TITLE: SPRING

DRG No. 4-V-J123-21798 REV. 00

COMP. CODE: 974628170000/964160760000

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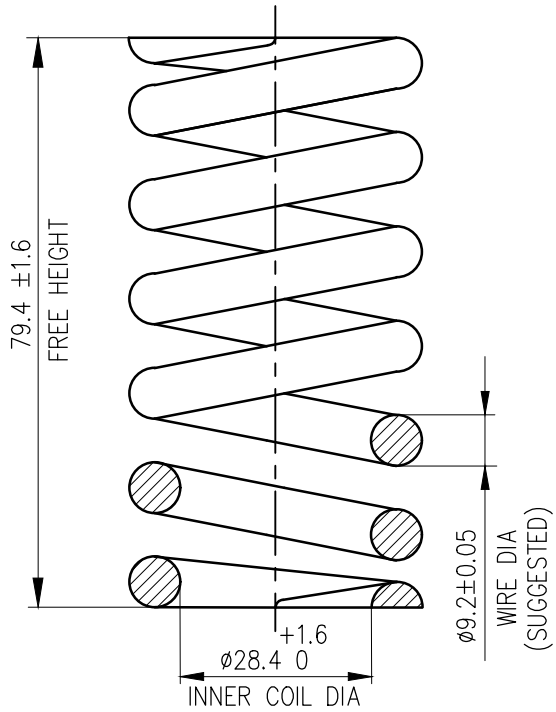

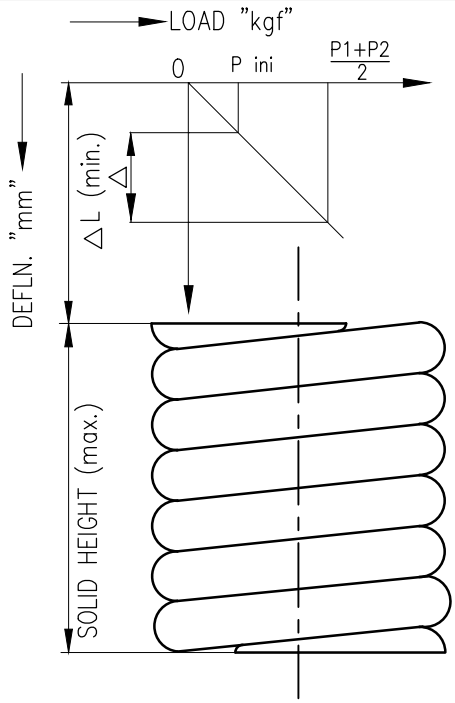

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0301270CR	
02	OUTSIDE DIA. MAX. LIMIT		(mm)	50.8
03	SPRING RATE (±4%)		(Kg/mm)	27.247
04	SOLID DEFLECTION △L min.		(mm)	19.8
05	INITIAL LOADING P ini		(Kgs)	80.9
06	TEST DEFLECTION △		(mm)	13.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	439.8
		P_2 MAX.	(Kgs)	477.4

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	16.8
09	EFFECTIVE NO.OF COILS	NOS	$5.0\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.4
11	PITCH	(mm)	13.4 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	780.0
13	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	
14	SPRING CODE	964165620000	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 13 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO ENSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

भेल BHEL
365-081/A
08.09.2020

	NAME	SIGN	DATE
DRAWN	J.DHANABAL		07.02.2022
CHECKED	R.RABIN		07.02.2022
APPROVED	S.MADHULINGAM		07.02.202

TITLE: SPRING

DRG No. 4-V-J127-21910 REV. 00

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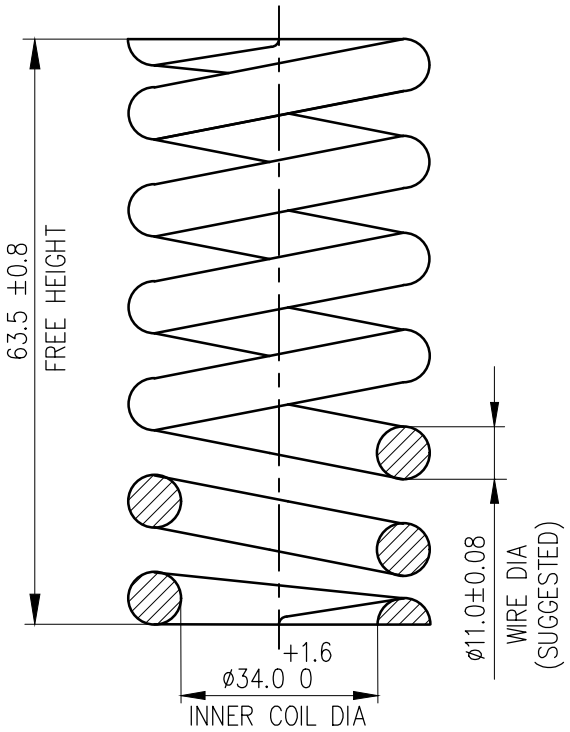

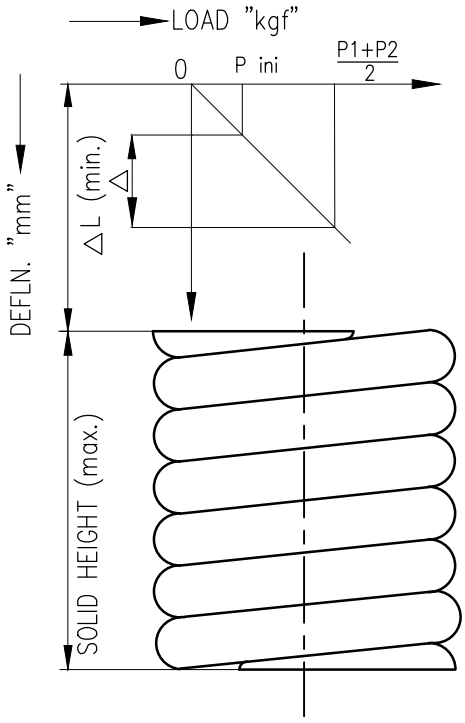

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0101510CR	
02	OUTSIDE DIA. MAX. LIMIT		(mm)	61.0
03	SPRING RATE (±4%)		(Kg/mm)	61.278
04	SOLID DEFLECTION △L min.		(mm)	15.0
05	INITIAL LOADING P ini		(Kgs)	137.9
06	TEST DEFLECTION △		(mm)	10.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	749.3
		P_2 MAX.	(Kgs)	813.3

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	12.8
09	EFFECTIVE NO.OF COILS	NOS	$2.7\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.47
11	PITCH	(mm)	17.2 ±0.5
12	DEVELOPED LENGTH OF ROD	(mm)	629.0
13	RAW MATERIAL LENGTH	(mm)	1205.0
14	RAW MATERIAL WEIGHT	(Kgs)	–
15	PROCESS OF MANUFACTURE	HOT/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 13 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. **ACCEPTABLE SPRING MATERIALS TO ATTEST:**
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.	ALTD:	REV.	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

365-081/A
08.09.2020

	NAME	SIGN	DATE
DRAWN	J.DHANABAL		27.02.2021
CHECKED	R.RABIN		27.02.
APPROVED	S.MADHULINGAM		27.02.

TITLE: SPRING

DRG No. 4-V-J151-23907 REV. 00

COMP. CODE: 964165560900

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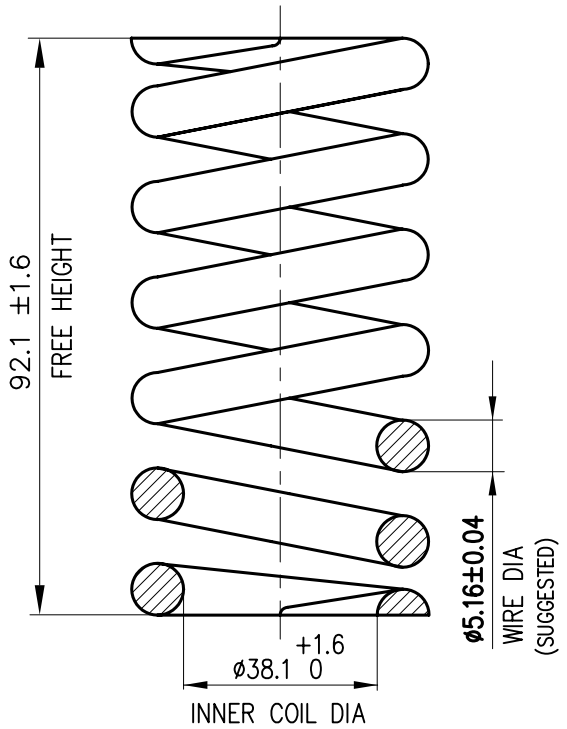

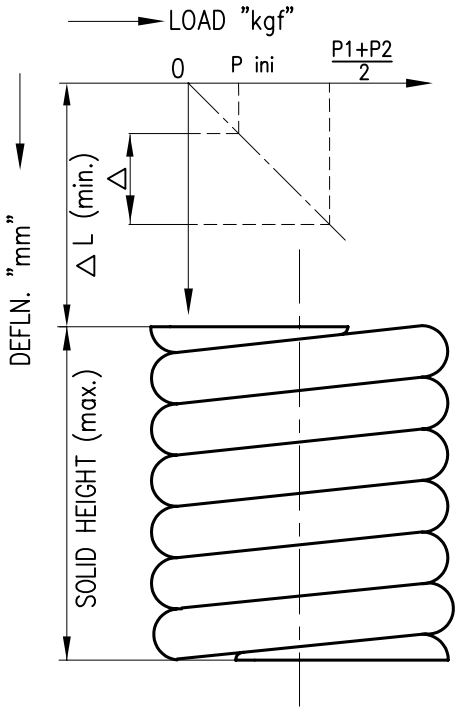

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102020CR**	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	1.446
04	AVERAGE DEFLECTION ΔL min.		(mm)	52.1
05	INITIAL LOADING P ini		(Kgs)	11.3
06	TEST DEFLECTION Δ		(mm)	36.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	61.4
		P_2 MAX.	(Kgs)	66.7
08	TILT DEFLECTION		(mm)	44.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.1^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.148
11	PITCH	(mm)	14.6 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	900
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974627700900/ 964156130900**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		22.05.07
CHECKED	E.Athiannavi		22.05.07
APPROVED	E.Athiannavi		22.05.

TITLE: SPRING

DRG No. 4-V-J202-23760 REV. 00

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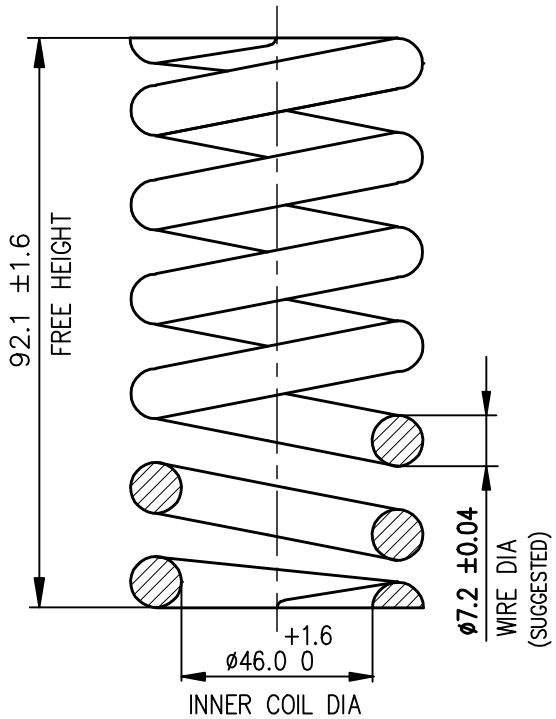

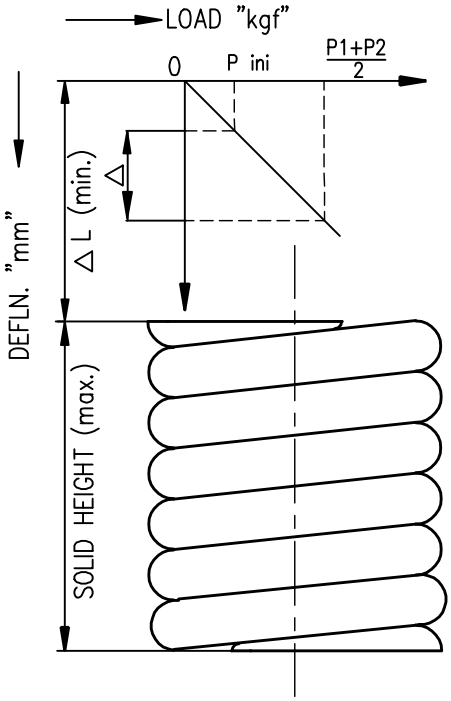

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0302060CR	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	4.285
04	AVERAGE DEFLECTION △L min.		(mm)	51.0
05	INITIAL LOADING P_{ini}		(Kgs)	32.8
06	TEST DEFLECTION △		(mm)	35.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	178.1
		P_2 MAX.	(Kgs)	193.4
08	TILT DEFLECTION		(mm)	43.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.2\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.261
11	PITCH	(mm)	20.2 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	815
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974622490000/ 964153290000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.			NAME	SIGN	DATE
04	ALTD:	03	ALTD: G.V	22.07.09	DRAWN: G.Venkateshwaralu		22.07.09
	CHKD:		CHKD: S.M	22.07.09	CHECKED: S.Madhulingam		22.07.09
	APPD:		APPD: E.A	22.07.09	APPROVED: E.Athiannavi		22.07.09

DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800903 Dt.21.01.09.

TITLE: SPRING

DRG No. 4-V-J206-21229 REV. 03

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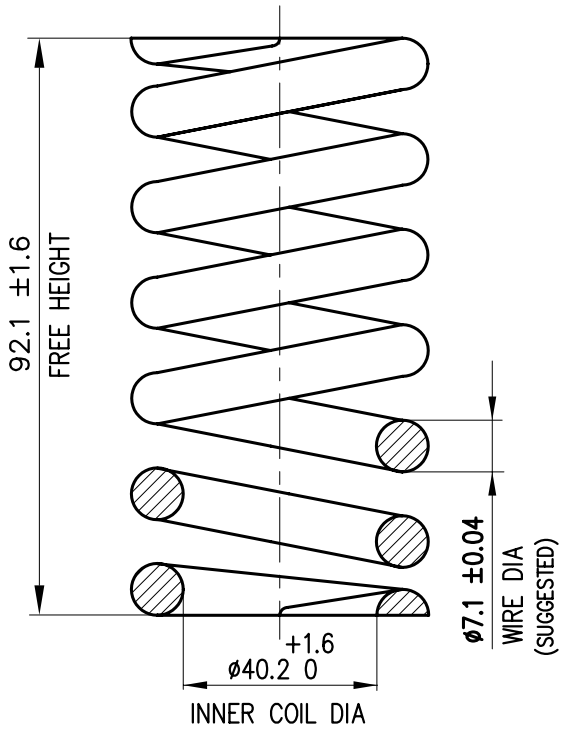

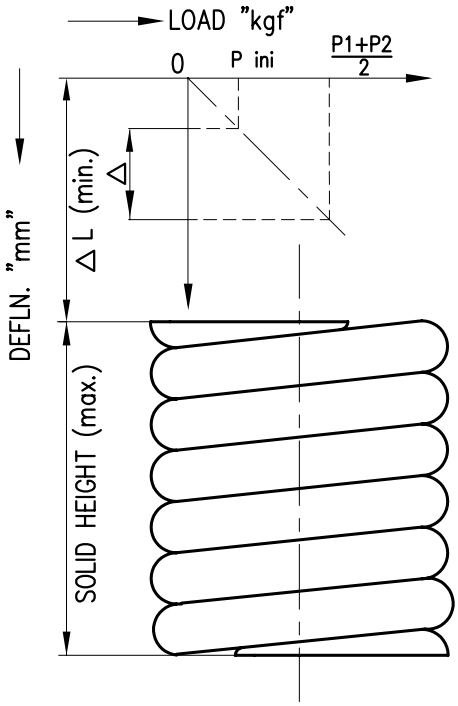

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102060CR	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	5.089
04	AVERAGE DEFLECTION Δ L min.		(mm)	48.1
05	INITIAL LOADING P ini		(Kgs)	36.7
06	TEST DEFLECTION Δ		(mm)	33.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	199.3
		P_2 MAX.	(Kgs)	216.4
08	TILT DEFLECTION		(mm)	40.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.25
11	PITCH	(mm)	17.9 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	801
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974626000900/ 964156620900	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.		REV.		
03	ALTD:	02	ALTD: G.V	27.04.09
	CHKD:		CHKD: S.M	27.04.09
	APPD:		APPD: E.A	27.04.09

MATERIAL CODE CHANGED
DCP.NO.800889 Dt.22.11.08.

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		27.04.09
CHECKED	S.Madhulingam		27.04.0
APPROVED	E.Athiannavi		27.04.0

TITLE: SPRING

DRG No. 4-V-J206-23457 REV. 02

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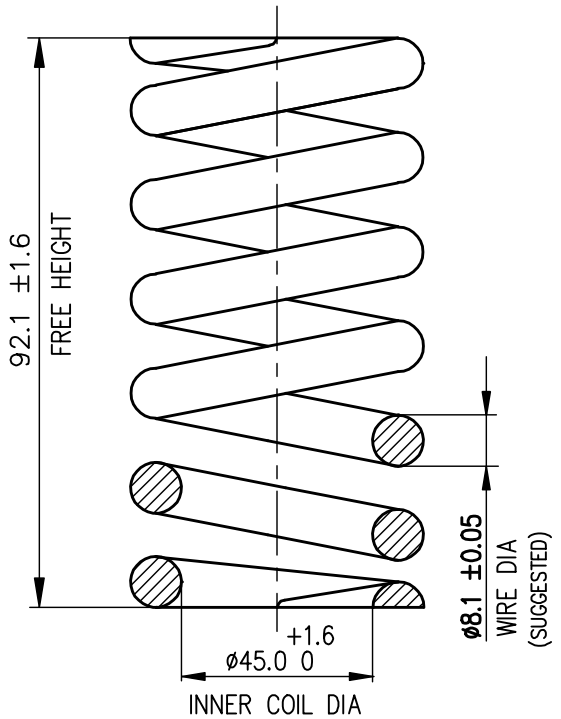

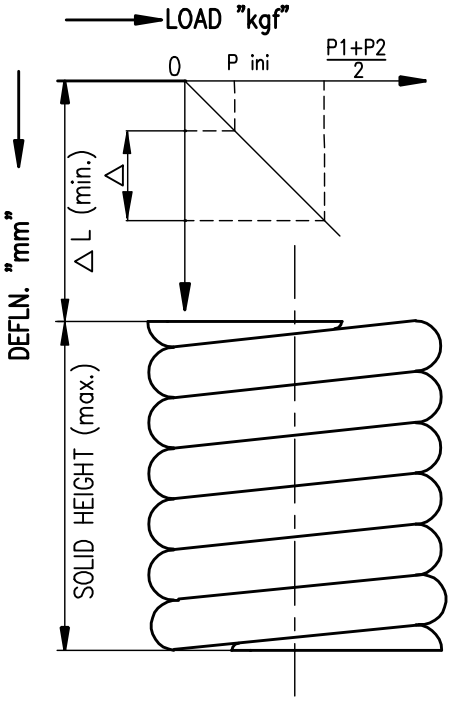

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102070CR	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	6.731
04	AVERAGE DEFLECTION △L min.		(mm)	44.3
05	INITIAL LOADING P_{ini}		(Kgs)	44.7
06	TEST DEFLECTION △		(mm)	31.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	242.9
		P_2 MAX.	(Kgs)	263.7
08	TILT DEFLECTION		(mm)	37.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.3\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.34
11	PITCH	(mm)	19.2 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	830
13	RAW MATERIAL DIA x LENGTH	(mm)	ø12.5x1400
14	RAW MATERIAL WEIGHT	(Kgs)	1.35
15	RAW MATERIAL CODE	–	
16	SPRING CODE	974624390900/ 964156610900	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2–735A50/735A51/735H51, BS 2803–735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.		REV.	
05	ALTD:	04	ALTD: G.V 22.11.08
	CHKD:		CHKD: E.A 22.11.08
	APPD:		APPD: E.A 22.11.08

MATERIAL CODE CHANGED
DCP. NO. 800889 DT.22.11.08

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		04.03.05
CHECKED	E.Athiannavi		04.03.05
APPROVED	E.Athiannavi		04.03.05

TITLE: SPRING

DRG No. 4–V–J207–23587 REV. 04

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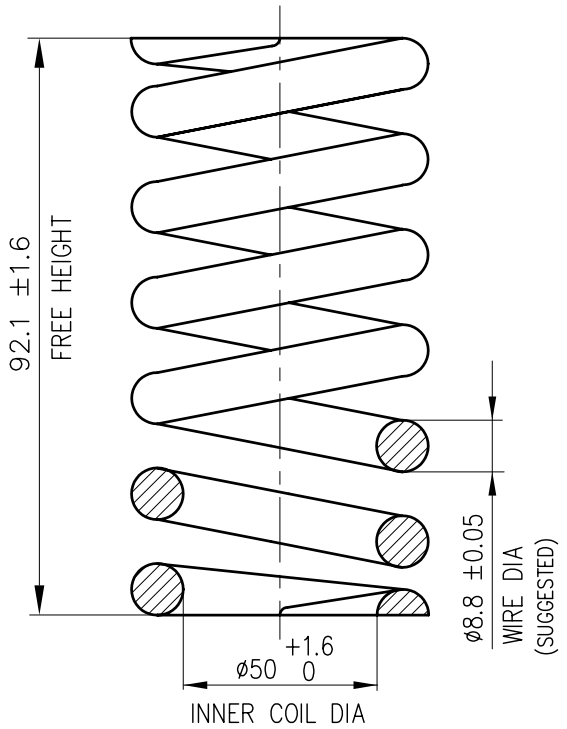

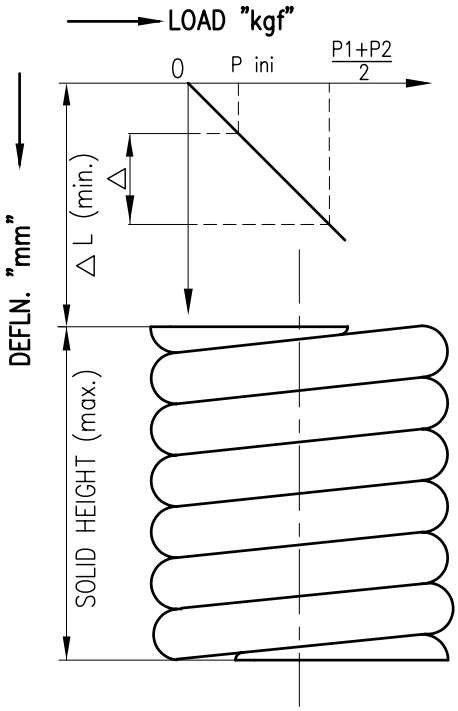

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0302080CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	69.9
03	SPRING RATE		(Kg/mm)	7.481
04	AVERAGE DEFLECTION △L min.		(mm)	43.1
05	INITIAL LOADING P ini		(Kgs)	48.3
06	TEST DEFLECTION △		(mm)	30.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	262.7
		P_2 MAX.	(Kgs)	285.2
08	TILT DEFLECTION		(mm)	36.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.0^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.4
11	PITCH	(mm)	20.5 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	--
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 13 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			
02	ALTD: G.V	18.09.10	
	CHKD: S.M	18.09.10	
	APPD: E.A	18.09.10	

NOTE-3 MODIFIED
DCP.No.801041

REV.			
01	ALTD: G.V	25.10.05	
	CHKD: E.A	25.10.05	
	APPD: E.A	25.10.05	

NOTE NO.3 ALTERED
DCP.NO.800519 DT.21.10.05

	NAME	SIGN	DATE
DRAWN	G.Venkateswaralu		07.01.05
CHECKED	E.Athiannavi		07.01.05
APPROVED	E.Athiannavi		07.01.0

TITLE: SPRING

DRG No. 4-V-J208-23738 REV. 02

COMP. CODE: 974624210900/964160640900

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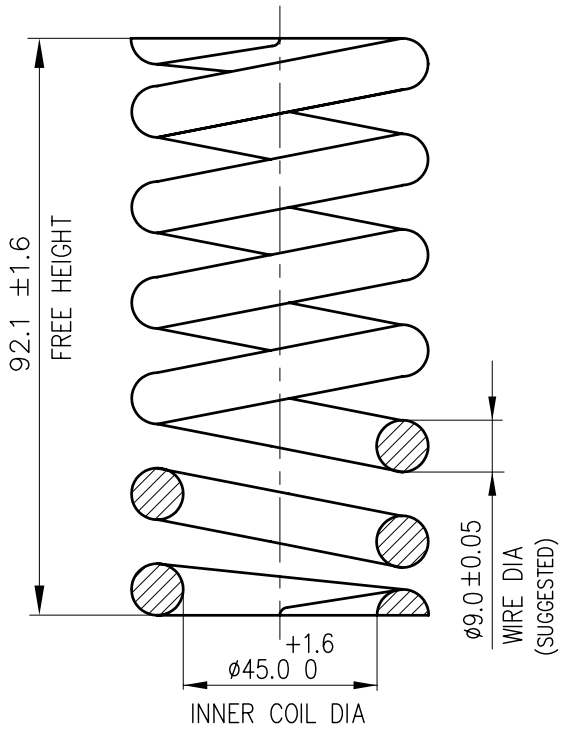

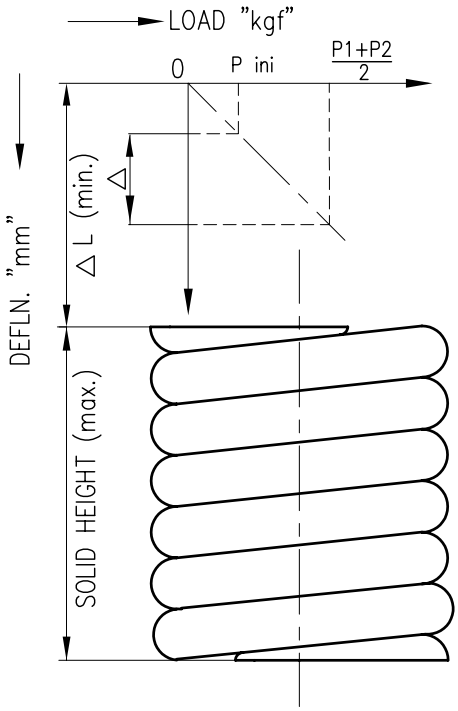

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0302090CR	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	8.927
04	AVERAGE DEFLECTION △L min.		(mm)	34.7
05	INITIAL LOADING P ini		(Kgs)	55.6
06	TEST DEFLECTION △		(mm)	29.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	301.8
		P_2 MAX.	(Kgs)	327.7
08	TILT DEFLECTION		(mm)	35.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.7\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.5
11	PITCH	(mm)	17.2 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	--
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			
02	ALTD: G.V	31.05.10	
	CHKD: S.M	31.05.10	
	APPD: E.A	31.05.10	

REV.			
01	ALTD: G.V	20.04.07	
	CHKD: E.A	20.04.07	
	APPD: E.A	20.04.07	

NOTES UPDATED
DCN.No.801041

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.2007

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		20.04.07
CHECKED	E.ATTHI ANNAVI		20.04.07
APPROVED	E.ATTHI ANNAVI		20.04.07

TITLE
SPRING

DRG No. 4-V-J209-23557 REV. 02

COMP. CODE: 974626430900/964156260900

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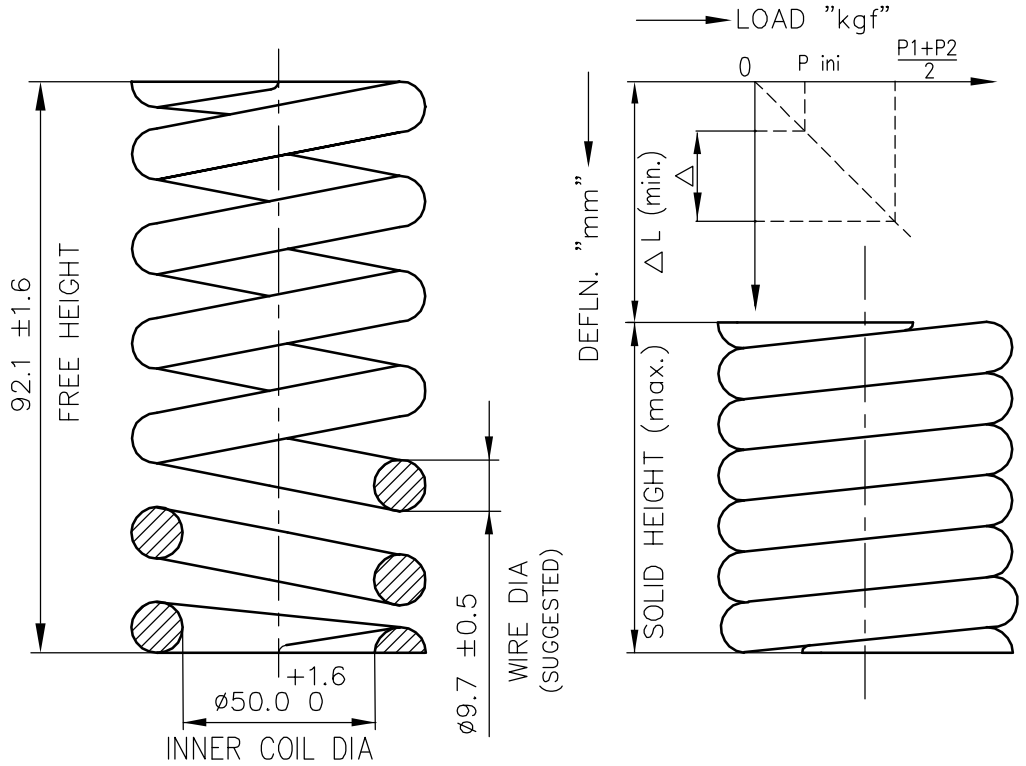

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102100CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	69.9
03	SPRING RATE		(Kg/mm)	11.159
04	AVERAGE DEFLECTION △L min.		(mm)	38.6
05	INITIAL LOADING P_{ini}		(Kgs)	64.6
06	TEST DEFLECTION △		(mm)	27.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	351.1
		P2 MAX.	(Kgs)	381.3

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	32.8
09	EFFECTIVE NO.OF COILS	NOS	$3.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.49
11	PITCH	(mm)	21.1±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	838
13	RAW MATERIAL DIA x LENGTH	(mm)	16 x 1430
14	RAW MATERIAL WEIGHT	(Kgs)	2.26
15	PROCESS OF MANUFACTURE	HOT/COLD COILING NOTE – 4	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322–6150/5160, A304–5160H/6150H/4161H, A401
   BS970 Pt2–735A51/735H51, BS2803–735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.				REV.			
04	ALTD: RPJ	26.03.2012		03	ALTD: RPJ	28.03.2011	
	CHKD: RPJ	26.03.2012			CHKD: VPP	28.03.2011	
	APPD: E.A	26.03.2012			APPD: E.A	28.03.2011	
	NOTES UPDATED DCP.No.801269				NOTES UPDATED DCP.No.801130		

	NAME	SIGN	DATE
DRAWN	LRS		26.03.2002
CHECKED	VPP		26.03.2002
APPROVED	KN		26.03.

TITLE: SPRING

DRG No. 4–V–J210–23588 REV. 04

COMP. CODE: 931725880900/964159620900/974626640901

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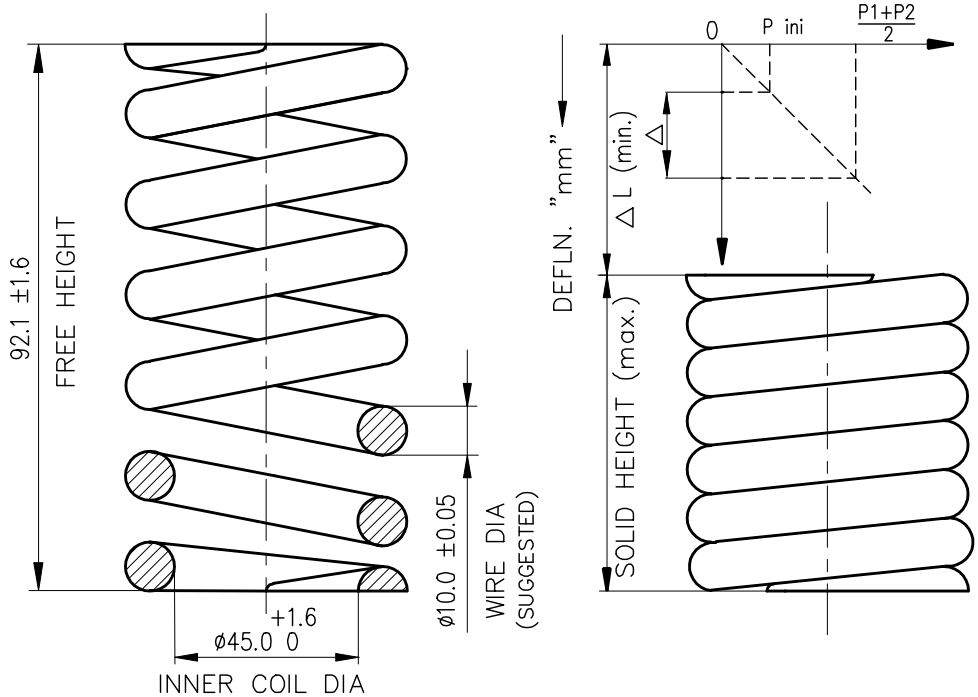

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102110CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	69.9
03	SPRING RATE		(Kg/mm)	12.498
04	AVERAGE DEFLECTION ΔL min.		(mm)	32.5
05	INITIAL LOADING P_{ini}		(Kgs)	61.0
06	TEST DEFLECTION Δ		(mm)	22.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	331.2
		P_2 MAX.	(Kgs)	359.6

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	27.6
09	EFFECTIVE NO.OF COILS	NOS	$4.9\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.6
11	PITCH	(mm)	17.4 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	944.0
13	RAW MATERIAL DIA x LENGTH	(mm)	16 x 1430
14	RAW MATERIAL WEIGHT	(Kgs)	2.3
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (Note-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 Gr.735A50/685A55
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
04	ALTD: RPJ	20.08.11	03	ALTD: G.V	16.03.09
	CHKD: RPJ	20.08.11		CHKD: VPP	16.03.09
	APPD: E.A	20.08.11		APPD: E.A	16.03.09

NOTES UPDATED
DCP. NO. 801130

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO. 800903 Dt.21.01.09

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		16.03.09
CHECKED	V.PERUMALPILLAI		16.03.09
APPROVED	E.ATHIANNAVI		16.03.09

TITLE: SPRING

DRG No. 4-V-J211-23424 REV. 04

COMP. CODE: 931724240900/964159340900/974627410900

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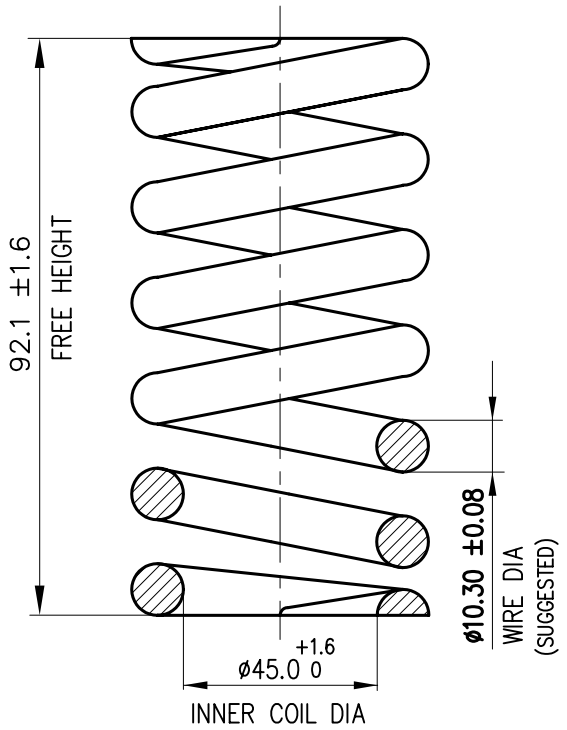

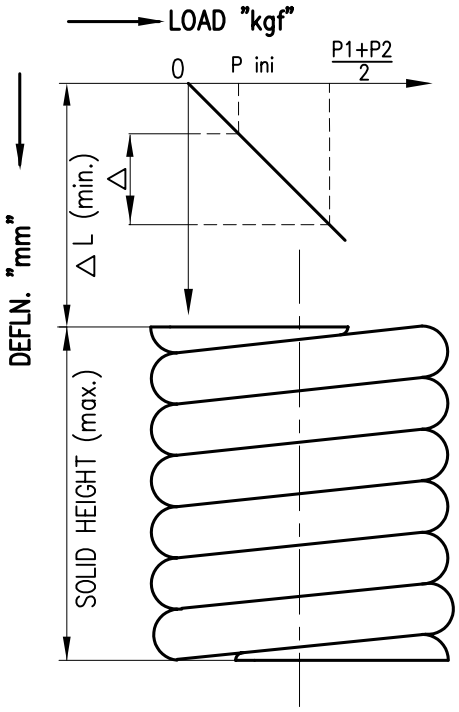

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102120CR**	
02	MAX. OUTSIDE DIA		mm	69.9
03	SPRING RATE		Kg/mm	14.105
04	AVERAGE DEFLECTION Δ L min.		mm	31.2
05	INITIAL LOADING P ini		Kg	66.1
06	TEST DEFLECTION Δ		mm	21.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	359.2
		P_2 MAX.	Kg	390.0
08	TILT DEFLECTION		mm	26.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.8^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	0.6
11	PITCH	mm	17.6 ±0.8
12	DEVELOPED LENGTH OF ROD	mm	935
13	RAW MATERIAL DIA x LENGTH	mm	ø18x1420
14	RAW MATERIAL WEIGHT	Kg	2.9
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931726640000/ 964156790000/ 974627420000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.						
02	ALTD:	01	ALTD: G.V	29.03.08		NAME	SIGN	DATE
	CHKD:		CHKD: E.A	29.03.08	DRAWN	G.VENKATESWARALU		29.03.08
	APPD:		APPD: E.A	29.03.08	CHECKED	E.ATHIANNAVI		29.03.08
					APPROVED	E.ATHIANNAVI		29.03.0

(REF: 4VJ21223664/02)

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

TITLE: SPRING

DRG No. 4-V-J212-21664 REV. 01

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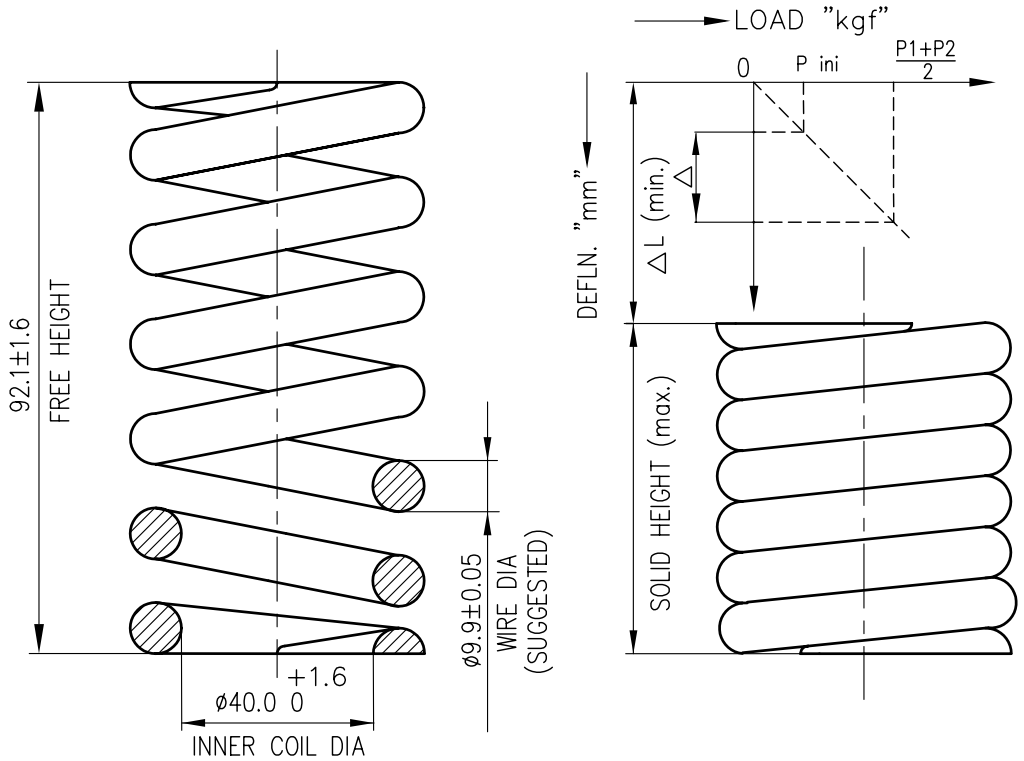

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102130CR	
02	OUTSIDE DIA MAX.LIMIT		(mm)	69.9
03	SPRING RATE		(Kg/mm)	16.248
04	AVERAGE DEFLECTION △L min.		(mm)	28.8
05	INITIAL LOADING P_{ini}		(Kgs)	70.1
06	TEST DEFLECTION △		(mm)	20.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	380.7
		P_2 MAX.	(Kgs)	413.5

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	24.4
09	EFFECTIVE NO.OF COILS	NOS	$4.8^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.5
11	PITCH	(mm)	16.5±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	850
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (Note-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: RPJ	08.07.2011	01	ALTD: GV	01.11.2008
	CHKD: VPP	08.07.2011		CHKD: EA	01.11.2008
	APPD: EA	08.07.2011		APPD: EA	01.11.2008

NOTES UPDATED
DCP.No.801130

NOTES UPDATED
DCP.No.800878
Dt.01.11.2008

	NAME	SIGN	DATE
DRAWN	GV		01.11.2008
CHECKED	EA		01.11.2008
APPROVED	EA		01.11.

TITLE: SPRING

DRG No. 4-V-J213-23707 REV. 02

COMP. CODE: 974623270900/964156870900/931727070900

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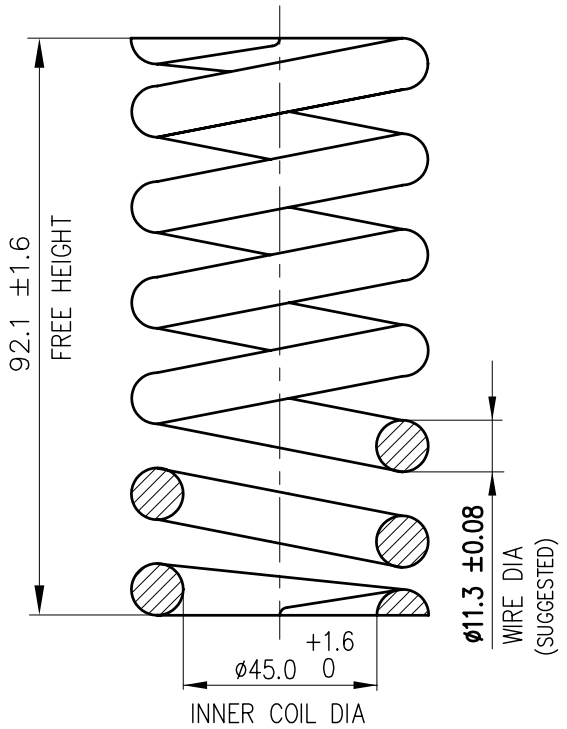
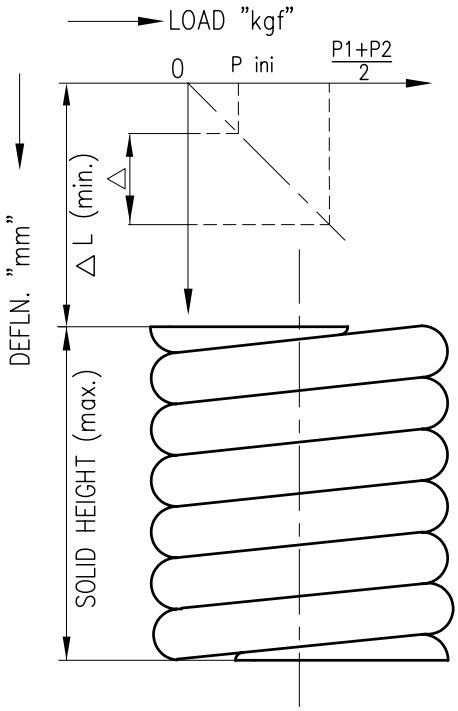
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102150CR	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	20.908
04	AVERAGE DEFLECTION △L min.		(mm)	28.3
05	INITIAL LOADING P ini		(Kgs)	88.8
06	TEST DEFLECTION △		(mm)	19.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	482.2
		P_2 MAX.	(Kgs)	523.6
08	TILT DEFLECTION		(mm)	24.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	4.4 $^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.7
11	PITCH	(mm)	18.6 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	895
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x1380
14	RAW MATERIAL WEIGHT	(Kgs)	2.75
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931721650000/ 974627680000/ 964160110000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.						
05	ALTD:	04	ALTD: G.V 16.01.10		DRAWN	LRS		15.06.96
	CHKD:		CHKD: S.M 16.01.10		CHECKED	VPP		15.06.96
	APPD:		APPD: E.A 16.01.10		APPROVED	KN		15.06.9

96 CODE ADDED AND DRG. UPDATED
DCP. NO. 800993 DT.16.10.09

TITLE: SPRING

DRG No. 4-V-J215-21165 REV. 04

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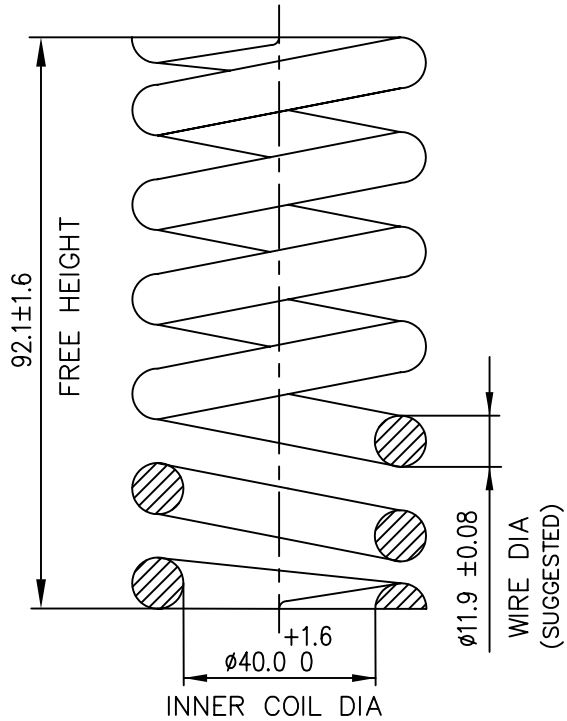

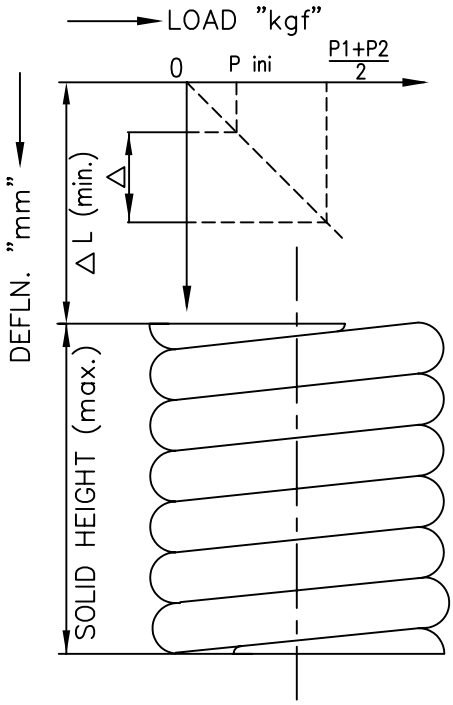

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102190CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	69.9
03	SPRING RATE		(Kg/mm)	32.407
04	AVERAGE DEFLECTION ΔL min.		(mm)	27.6
05	INITIAL LOADING P_{ini}		(Kgs)	134.0
06	TEST DEFLECTION Δ		(mm)	19.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	729.0
		P_2 MAX.	(Kgs)	791.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	23.4
09	EFFECTIVE NO.OF COILS	NOS	$4.5\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.8
11	PITCH	(mm)	18.2 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	834.0
13	RAW MATERIAL DIA x LENGTH	(mm)	16 x 1370
14	RAW MATERIAL WEIGHT	(Kgs)	2.2
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (Note-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 Gr.735A50/685A55
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: RPJ	03.06.11
	CHKD:		CHKD: RPJ	03.06.11
	APPD:		APPD: E.A	03.06.11

NOTES UPDATED
DCP. NO. 801130

	NAME	SIGN	DATE
DRAWN	LRS		19.02.2005
CHECKED	VPP		19.02.
APPROVED	EA		19.02.

TITLE SPRING

DRG No. 4-V-J219-23056 REV. 01

COMP. CODE: 931720560900/964152990900/974625610900

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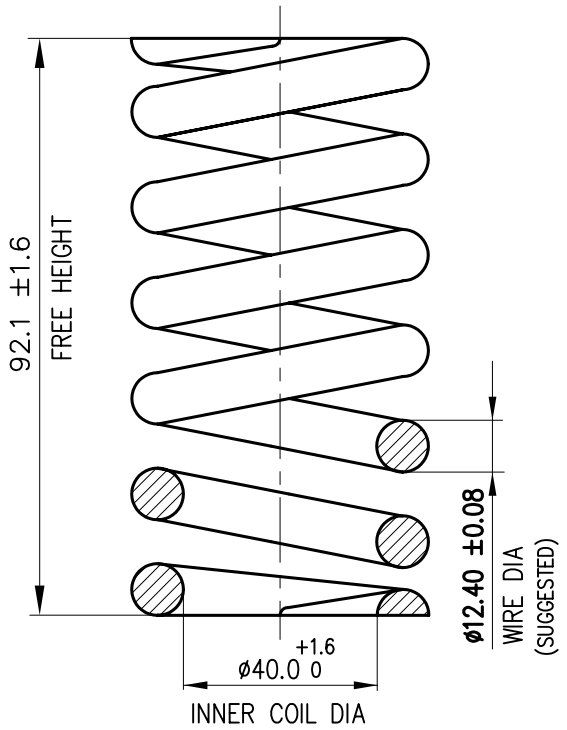

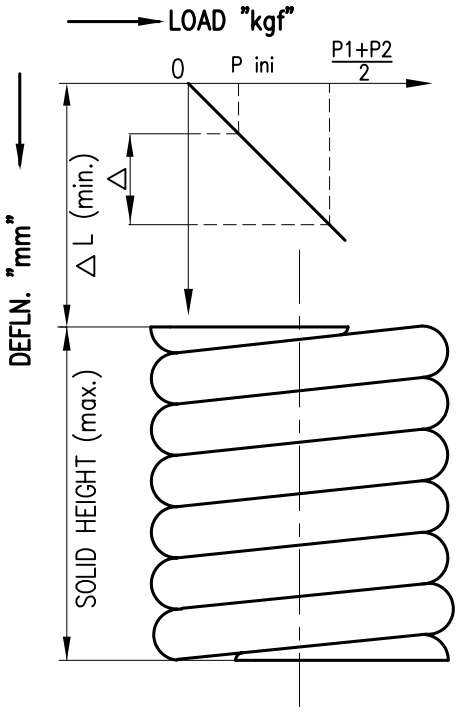

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102200CR**	
02	MAX. OUTSIDE DIA		mm	69.9
03	SPRING RATE		Kg/mm	36.692
04	AVERAGE DEFLECTION ΔL min.		mm	22.6
05	INITIAL LOADING P_{ini}		Kg	124.4
06	TEST DEFLECTION Δ		mm	15.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	676.0
		P_2 MAX.	Kg	734.1
08	TILT DEFLECTION		mm	19.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.5^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	0.8
11	PITCH	mm	17.8 ±0.8
12	DEVELOPED LENGTH OF ROD	mm	850.0
13	RAW MATERIAL DIA x LENGTH	mm	ø18x1330
14	RAW MATERIAL WEIGHT	Kg	2.7
15	RAW MATERIAL CODE	15327450100	
16	SPRING CODE	**931721750000/ 964156810000/ 974627870000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.			NAME	SIGN	DATE
03	ALTD:	02	ALTD: G.V	29.03.08	DRAWN: G.VENKATESWARALU		29.03.08
	CHKD:		CHKD: E.A	29.03.08	CHECKED: E.ATHIANNAVI		29.03.08
	APPD:		APPD: E.A	29.03.08	APPROVED: E.ATHIANNAVI		29.03.0

(REF: 4VJ22023175/01)

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

TITLE: SPRING

DRG No. 4-V-J220-21175 REV. 02

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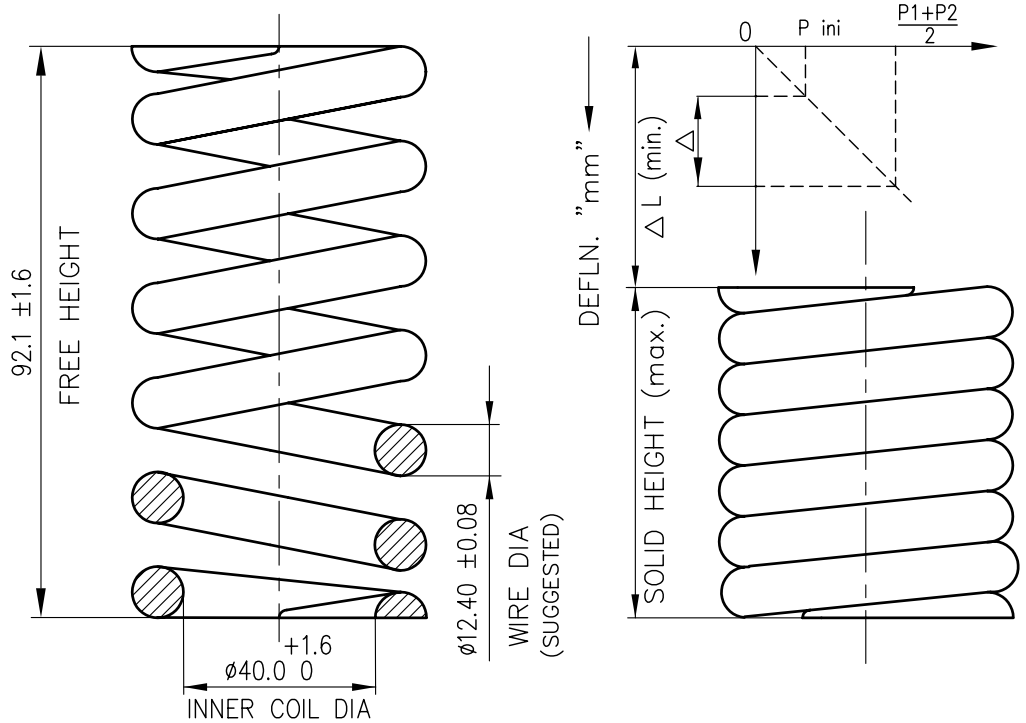

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102200CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	69.9
03	SPRING RATE		(Kg/mm)	36.692
04	AVERAGE DEFLECTION ΔL min.		(mm)	22.6
05	INITIAL LOADING P_{ini}		(Kgs)	124.4
06	TEST DEFLECTION Δ		(mm)	15.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	676.0
		P_2 MAX.	(Kgs)	734.1

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	19.2
09	EFFECTIVE NO.OF COILS	NOS	$4.5\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.8
11	PITCH	(mm)	17.8±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	850.0
13	RAW MATERIAL DIA x LENGTH	(mm)	18 x 1330
14	RAW MATERIAL WEIGHT	(Kgs)	2.7
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 Gr.735A50/685A55
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV. 02	ALTD: RPJ	23.07.11	REV. 01	ALTD: LRS	21.01.03
	CHKD: RPJ	23.07.11		CHKD: VPP	21.01.03
	APPD: E.A	23.07.11		APPD: KN	21.01.03

NOTES UPDATED
DCP. NO. 801130

RAW MATERIAL CODE 153274050100
WAS 15927211
DCP. NO. 800159

	NAME	SIGN	DATE
DRAWN	LRS		23.01.2001
CHECKED	VPP		23.01.
APPROVED	KN		23.01.

TITLE: SPRING

DRG No. 4-V-J220-23175 REV. 02

COMP. CODE: 931721750900/964156810900/974627870900

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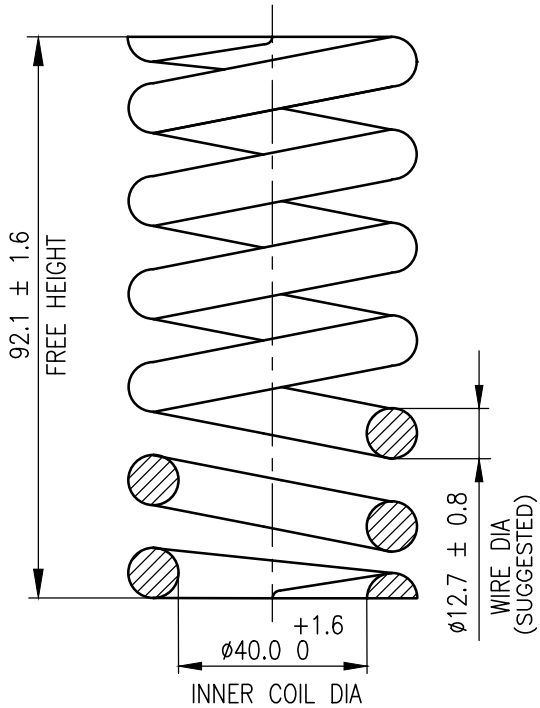

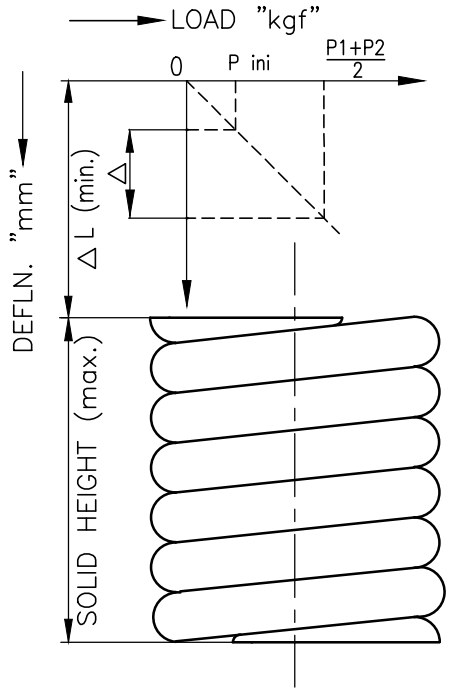

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102210CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	69.9
03	SPRING RATE		(Kg/mm)	41.423
04	AVERAGE DEFLECTION △L min.		(mm)	23.4
05	INITIAL LOADING P_{ini}		(Kgs)	145.2
06	TEST DEFLECTION △		(mm)	16.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	788.9
		P_2 MAX.	(Kgs)	856.6

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	19.9
09	EFFECTIVE NO.OF COILS	NOS	$4.4^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.8
11	PITCH	(mm)	18.4 ± 0.8
12	DEVELOPED LENGTH OF ROD	(mm)	826.1
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18 x 1310
14	RAW MATERIAL WEIGHT	(Kgs)	2.6
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE – 4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322–6150/5160, A304–5160H/6150H/4161H, A401, A231
   BS970 Pt2–735A51/735H51, BS2803–735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270–2/IS4454–2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: R.P.J	23.08.2013	01	ALTD: R.P.J	03.08.2011
	CHKD: S.M	23.08.2013		CHKD: S.M	03.08.2011
	APPD: E.A	23.08.2013		APPD: E.A	03.08.2011
	NOTES UPDATED DCP No.: 801440			NOTES UPDATED DCP NO.: 801130	

	NAME	SIGN	DATE
DRAWN	LRS		04.05.2002
CHECKED	VPP		04.05.2002
APPROVED	KN		04.05.2

365-081

TITLE: SPRING

DRG No. 4–V–J221–23033 REV. 02

COMP. CODE: 931720330900/964153000900/974426200900

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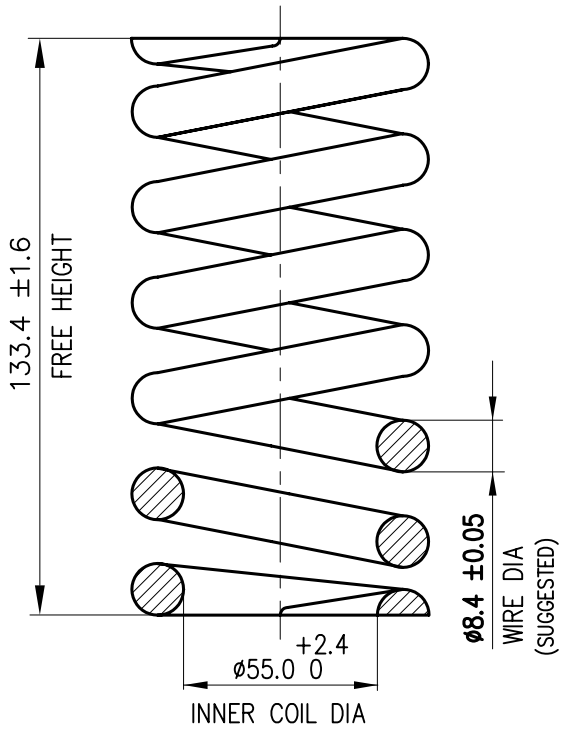

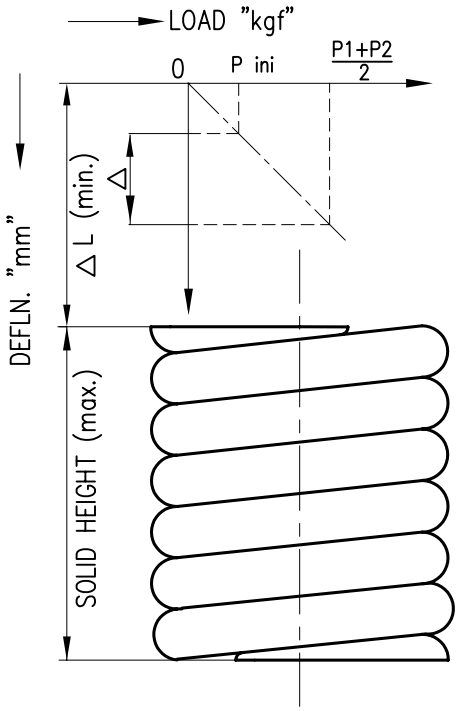

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102530CR**	
02	MAX. OUTSIDE DIA		(mm)	85.7
03	SPRING RATE		(Kg/mm)	2.928
04	AVERAGE DEFLECTION ΔL min.		(mm)	64.5
05	INITIAL LOADING P ini		(Kgs)	28.3
06	TEST DEFLECTION Δ		(mm)	45.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	154.0
		P_2 MAX.	(Kgs)	167.2
08	TILT DEFLECTION		(mm)	54.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.623
11	PITCH	(mm)	18.9 ±0.6
12	DEVELOPED LENGTH OF ROD	(mm)	1432
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974529250900/ 964156180900**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		23.05.07
CHECKED	E.Athiannavi		23.05.07
APPROVED	E.Athiannavi		23.05.

TITLE: SPRING

DRG No. 4-V-J253-23145 REV. 00

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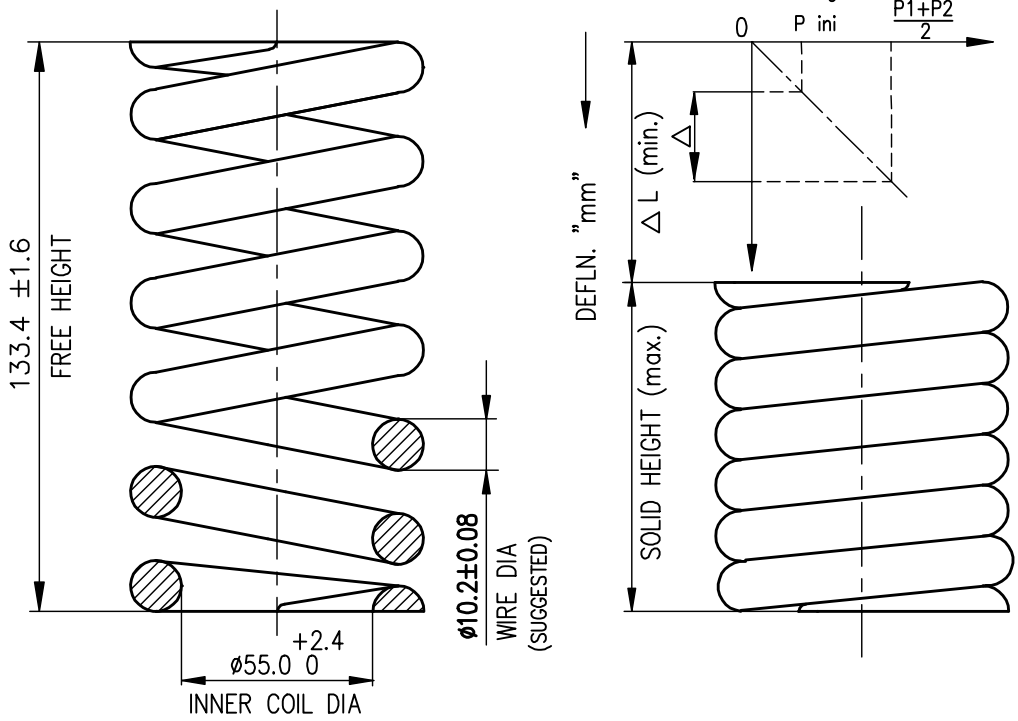

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102560CR	
02	MAX. OUTSIDE DIA		(mm)	85.7
03	SPRING RATE		(Kg/mm)	6.821
04	AVERAGE DEFLECTION △L min.		(mm)	59.7
05	INITIAL LOADING P ini		(Kgs)	61.1
06	TEST DEFLECTION △		(mm)	41.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	331.8
		P_2 MAX.	(Kgs)	360.3
08	TILT DEFLECTION		(mm)	50.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.8 $^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.830
11	PITCH	(mm)	21.4 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1294
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974627750900/ 964156190900	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.		REV.	
02	ALTD:	01	ALTD: G.V 26.11.08
	CHKD:		CHKD: E.A 26.11.08
	APPD:		APPD: E.A 26.11.08

MATERIALS UPDATED
DCP. NO. 800878 DT.01.11.08

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		23.05.07
CHECKED	E.Athiannavi		23.05.07
APPROVED	E.Athiannavi		23.05.0

TITLE: SPRING

DRG No. 4-V-J256-23765 REV. 01

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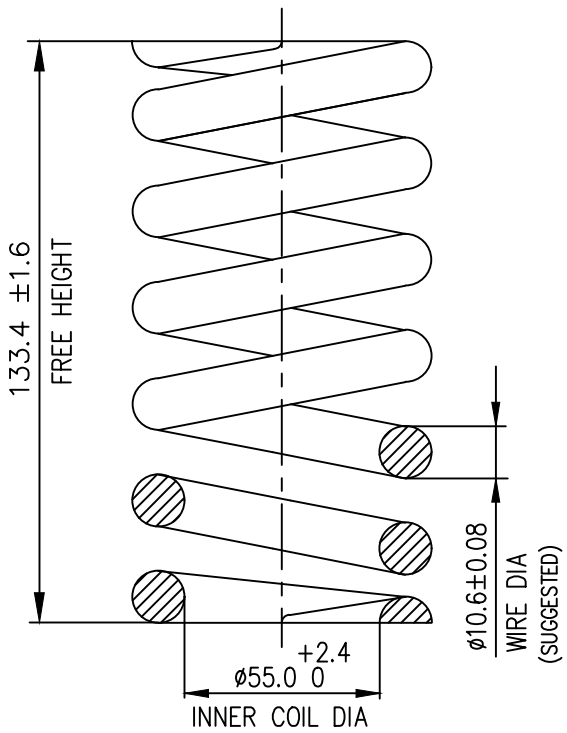
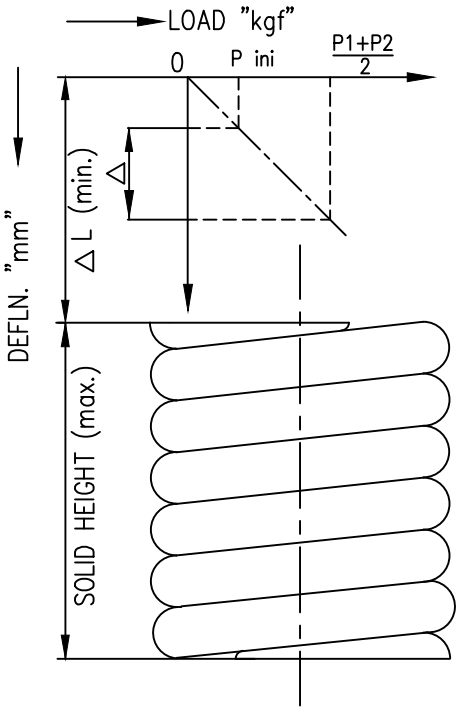
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102562CR	
02	MAX. OUTSIDE DIA		(mm)	85.7
03	SPRING RATE		(Kg/mm)	7.945
04	AVERAGE DEFLECTION ΔL min.		(mm)	58.1
05	INITIAL LOADING P_{ini}		(Kgs)	69.2
06	TEST DEFLECTION Δ		(mm)	40.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	376.3
		P_2 MAX.	(Kgs)	408.5
08	TILT DEFLECTION		(mm)	49.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.03
11	PITCH	(mm)	21.6 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1491
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	974611680900/ 931729010900	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	J.Dhanabal		30.09.19
CHECKED	R.Rabin		30.09
APPROVED	S.Madhulingam		30.09

TITLE SPRING

DRG No. 4-V-J256-23901 REV. 00

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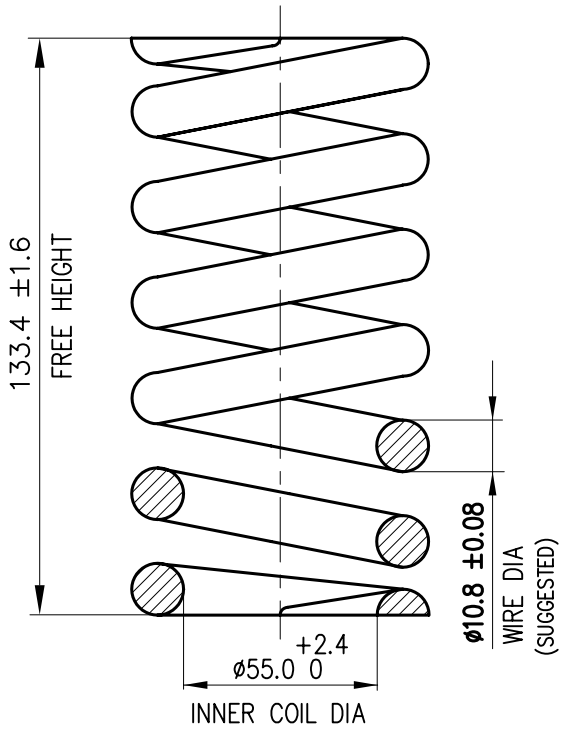

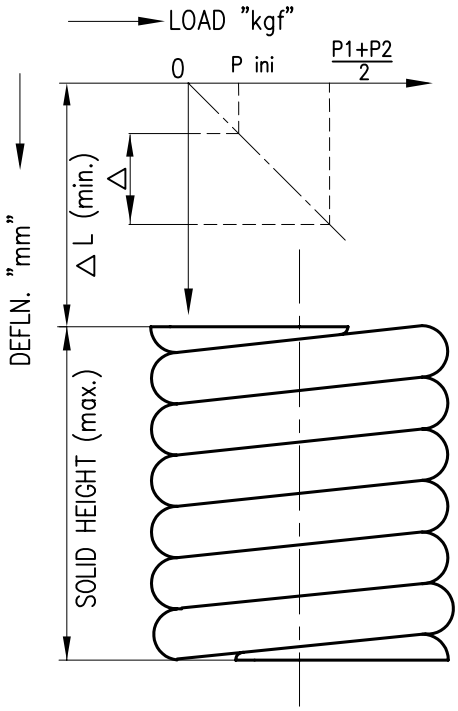

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102570CR**	
02	MAX. OUTSIDE DIA		(mm)	85.7
03	SPRING RATE		(Kg/mm)	8.981
04	AVERAGE DEFLECTION Δ L min.		(mm)	58.9
05	INITIAL LOADING P ini		(Kgs)	79.4
06	TEST DEFLECTION Δ		(mm)	41.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	431.3
		P_2 MAX.	(Kgs)	468.4
08	TILT DEFLECTION		(mm)	50.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.4^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.9
11	PITCH	(mm)	22.5 ±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1239
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974627530900/ 964156770900**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED, IF INDIGENOUSLY PROCURED, CERTIFICATE BY "STATE BOILER INSPECTORATE" IS REQUIRED.

REV.		REV.						
02	ALTD:	01	ALTD: G.V	14.02.08	DRAWN	G.VENKATESWARALU		14.02.08
	CHKD:		CHKD: E.A	14.02.08	CHECKED	E.Athiannavi		14.02.08
	APPD:		APPD: E.A	14.02.08	APPROVED	E.Athiannavi		14.02.0

DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800783 DT.07.01.08.

TITLE: SPRING

DRG No. 4-V-J257-23345 REV. 01

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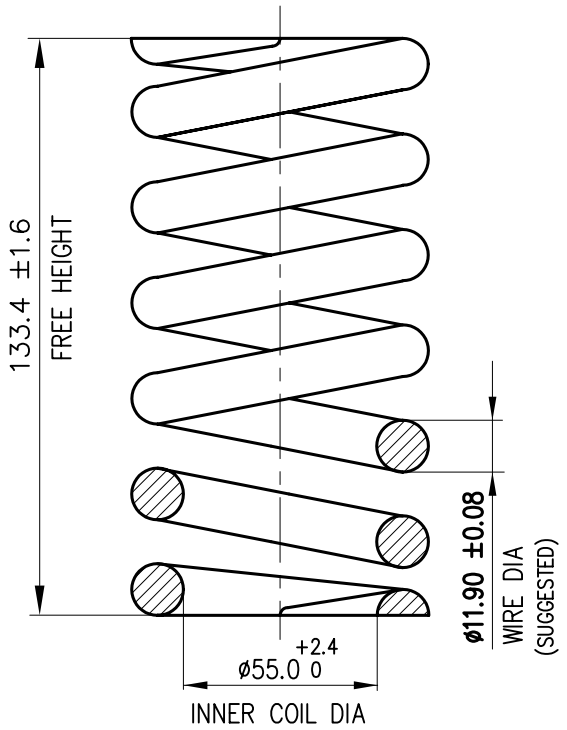

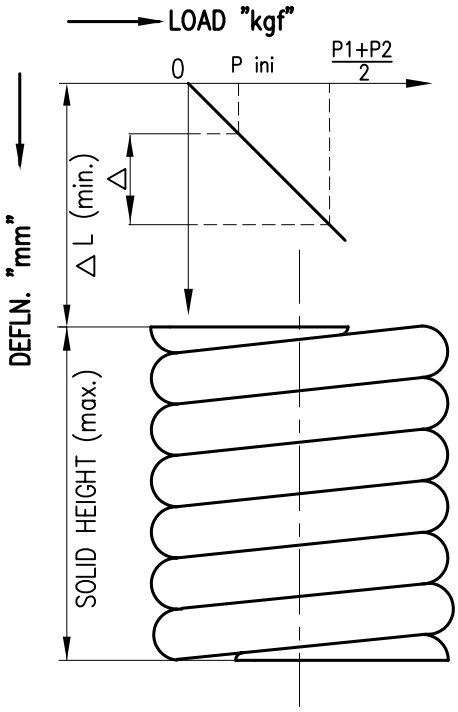

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102580CR**	
02	MAX. OUTSIDE DIA		mm	85.7
03	SPRING RATE		Kg/mm	10.945
04	AVERAGE DEFLECTION ΔL min.		mm	48.3
05	INITIAL LOADING P_{ini}		Kg	79.2
06	TEST DEFLECTION Δ		mm	33.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	430.5
		P_2 MAX.	Kg	467.5
08	TILT DEFLECTION		mm	41.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.2\ ^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	1.2
11	PITCH	mm	20.5 ±0.7
12	DEVELOPED LENGTH OF ROD	mm	1403
13	RAW MATERIAL DIA x LENGTH	mm	ø18x1857
14	RAW MATERIAL WEIGHT	Kg	3.8
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931721660000/ 964156830000/ 974198900000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.		
05	ALTD:	04	ALTD: G.V	29.03.08
	CHKD:		CHKD: E.A	29.03.08
	APPD:		APPD: E.A	29.03.08

(REF: 4VJ25823166/01)

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		29.03.08
CHECKED	E.ATHIANNAVI		29.03.08
APPROVED	E.ATHIANNAVI		29.03.0

TITLE: SPRING

DRG No. 4-V-J258-21166 REV. 04

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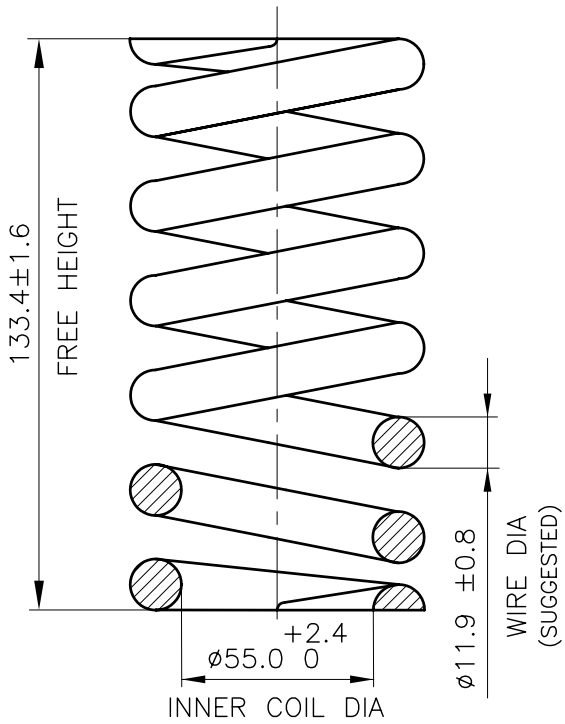

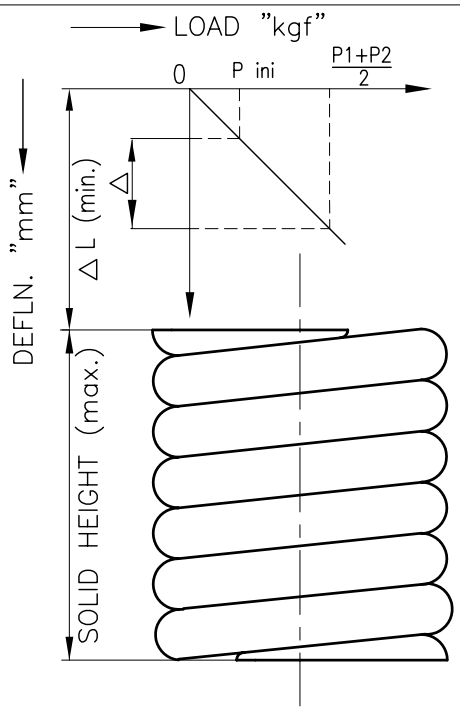

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102580CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	85.7
03	SPRING RATE		(Kg/mm)	10.945
04	AVERAGE DEFLECTION △L min.		(mm)	48.3
05	INITIAL LOADING P_{ini}		(Kgs)	79.2
06	TEST DEFLECTION △		(mm)	33.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	430.5
		P_2 MAX.	(Kgs)	467.5
08	TILT DEFLECTION		(mm)	41.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	$6.2\ ^{0}_{-1/2}$
10	SPRING WEIGHT	(Kgs)	1.2
11	PITCH	(mm)	20.5±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1403
13	RAW MATERIAL DIA x LENGTH	(mm)	ø14X1910
14	RAW MATERIAL WEIGHT	(Kgs)	2.30
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.				REV.			
03	ALTD: G.V	16.12.11		02	ALTD:	A.S.J	
	CHKD: S.M	16.12.11			CHKD:	V.P.P	
	APPD: E.A	16.12.11			APPD:	E.A	04.11.08
NOTES UPDATED DCN.No.801130 Dt.03.01.11				SPRING MATERIAL ALTERED. IN NOTE.3 NOTE.5 ALTERED. DCP No: 800877 Dt.29.10.08			

	NAME	SIGN	DATE
DRAWN	LRS		15.07.2003
CHECKED	EA		15.07.2003
APPROVED	EA		15.07.

TITLE SPRING

DRG No. 4-V-J258-23166 REV. 03

COMP. CODE: 974198900900/964156830900/931721660900

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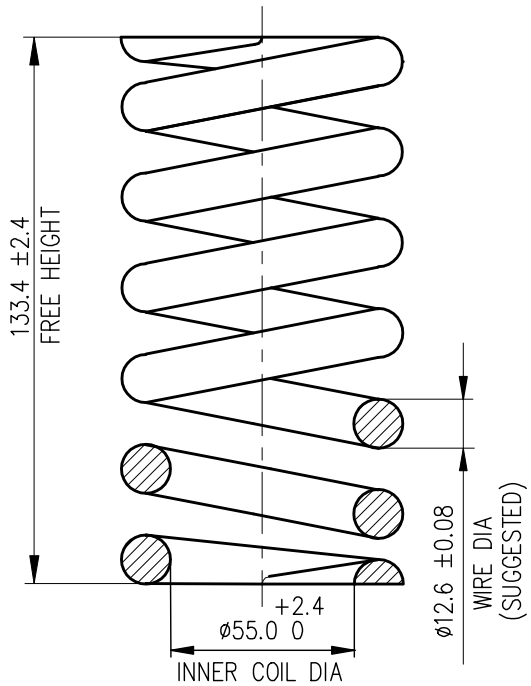

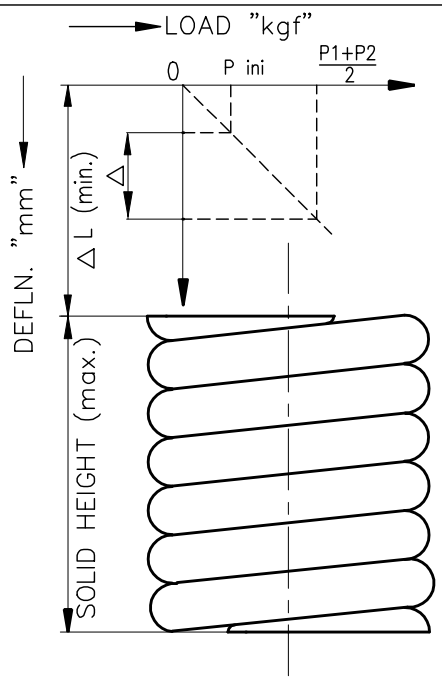

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102600CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	85.7
03	SPRING RATE		(Kg/mm)	14.927
04	AVERAGE DEFLECTION ΔL min.		(mm)	50.5
05	INITIAL LOADING P_{ini}		(Kgs)	113.2
06	TEST DEFLECTION Δ		(mm)	35.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	614.9
		P_2 MAX.	(Kgs)	667.7

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	43.0
09	EFFECTIVE NO.OF COILS	NOS	$5.5\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.3
11	PITCH	(mm)	22.7±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1291
13	RAW MATERIAL DIA x LENGTH	(mm)	18 x 1800
14	RAW MATERIAL WEIGHT	(Kgs)	3.6
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322–6150/5160, A304–5160H/6150H/4161H, A401
   BS970 Pt2–735A51/735H51, BS2803–735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: RPJ	24.03.2012	01	ALTD: LRS	10.09.2003
	CHKD: SM	24.03.2012		CHKD: EA	10.09.2003
	APPD: E.A	24.03.2012		APPD: E.A	10.09.2003

NOTES UPDATED
DCP.No.801269

RAW MATERIAL CODE
153274050100
WAS 153274050000
DCP.No.800233

	NAME	SIGN	DATE
DRAWN	LRS		05.07.2003
CHECKED	EA		05.07.2003
APPROVED	EA		05.07.2003

TITLE: SPRING

DRG No. 4–V–J260–23129 REV. 02

COMP. CODE: 931721290900/964161850900

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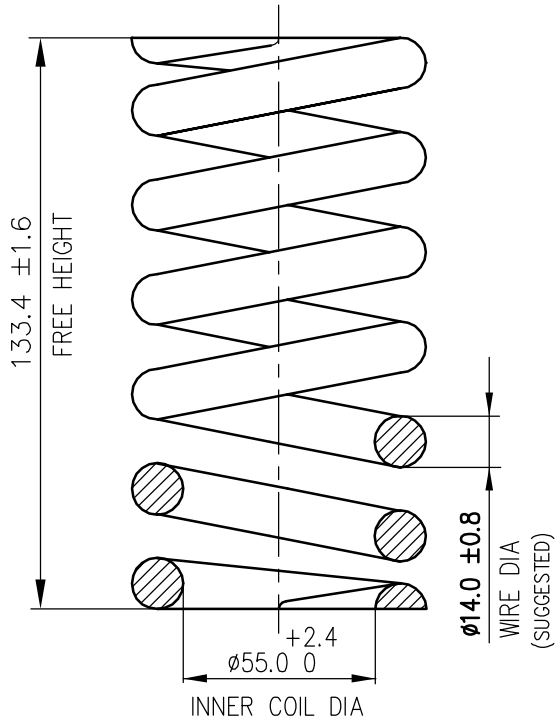

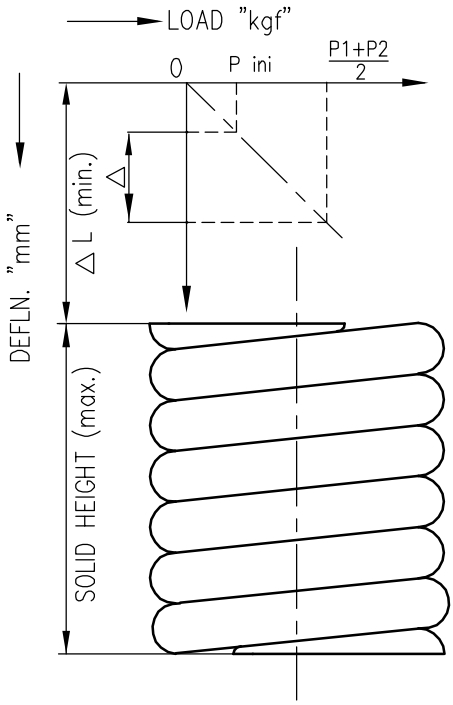

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102630CR	
02	MAX. OUTSIDE DIA		(mm)	85.7
03	SPRING RATE		(Kg/mm)	21.962
04	AVERAGE DEFLECTION △L min.		(mm)	42.1
05	INITIAL LOADING P ini		(Kgs)	138.8
06	TEST DEFLECTION △		(mm)	29.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	754.2
		P_2 MAX.	(Kgs)	819.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	35.8
09	EFFECTIVE NO. OF COILS	NOS	$5.4\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.6
11	PITCH	(mm)	22.9±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1290
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x1800
14	RAW MATERIAL WEIGHT	(Kgs)	3.6
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: G.V	05.09.12	01	ALTD: G.V	09.03.10
	CHKD: S.M	05.09.12		CHKD: S.M	09.03.10
	APPD: E.A	05.09.12		APPD: E.A	09.03.10
NOTES UPDATED DCP.No.801269			SPRING CODE UPDATED DCN.No.801027 DATED: 30.01.2010.		

365-081		NAME	SIGN	DATE
	DRAWN	A.Param		18.06.04
	CHECKED	K.S.Raju		18.06.04
	APPROVED	K.S.Raju		18.06

TITLE: SPRING

DRG No. 4-V-J263-23109 REV. 02

COMP. CODE: 931721090900/964160330900/974625080900

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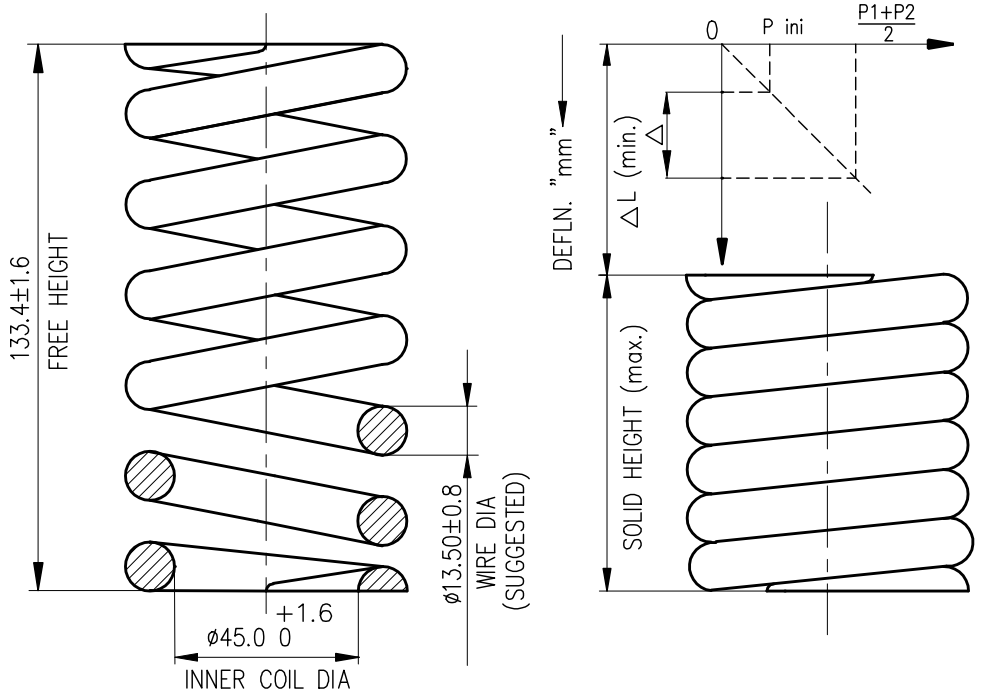

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102650CR	
02	OUTSIDE DIA MAX.LIMIT		(mm)	85.7
03	SPRING RATE		(Kg/mm)	27.872
04	AVERAGE DEFLECTION ΔL min.		(mm)	39.5
05	INITIAL LOADING P_{ini}		(Kgs)	165.4
06	TEST DEFLECTION Δ		(mm)	27.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	898.3
		P_2 MAX.	(Kgs)	975.5

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	33.6
09	EFFECTIVE NO.OF COILS	NOS	$6.0^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.3
11	PITCH	(mm)	20.6±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1201.0
13	RAW MATERIAL DIA x LENGTH	(mm)	18 x 1690
14	RAW MATERIAL WEIGHT	(Kgs)	3.4
15	PROCESS OF MANUFACTURE	HOT COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: RPJ	01.12.2011	01	ALTD: LRS	03.01.2003
	CHKD: SM	01.12.2011		CHKD: VPP	03.01.2003
	APPD: EA	01.12.2011		APPD: KN	03.01.2003

NOTES UPDATED
DCP NO.801130

RAW MATERIAL CODE
153274050100
WAS 15927211
DCP.No.800159

	NAME	SIGN	DATE
DRAWN	LRS		12.02.2001
CHECKED	VPP		12.02.2001
APPROVED	KN		12.02.2001

TITLE SPRING

DRG No. 4-V-J265-23094 REV. 02

COMP. CODE: 931720940900/974622040900/964161670900

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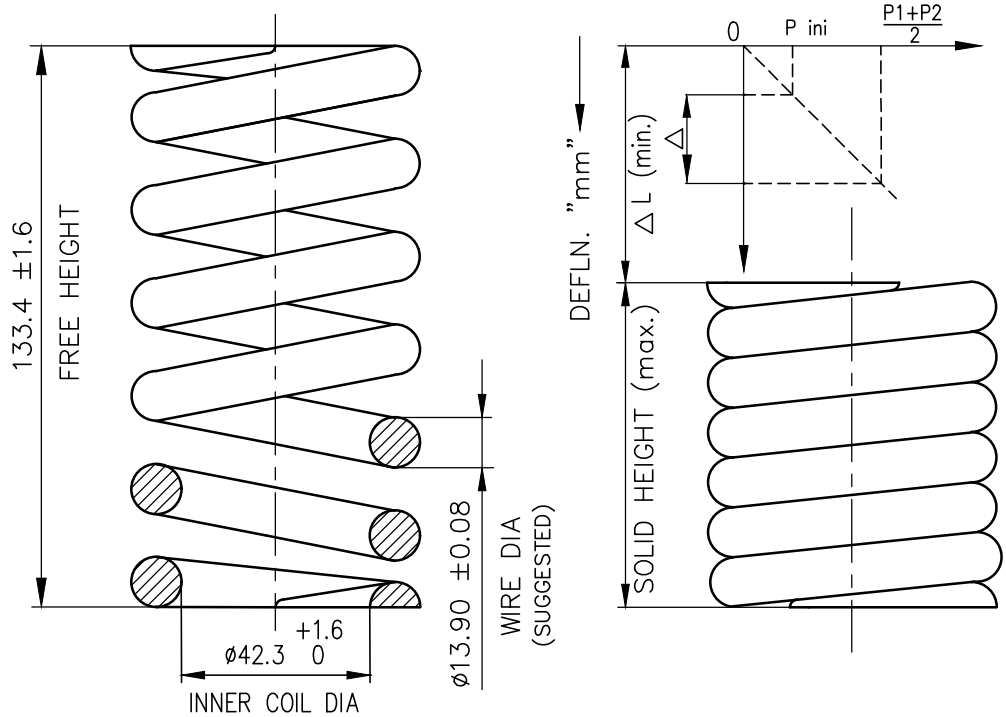

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102670CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	88.9
03	SPRING RATE		(Kg/mm)	34.674
04	AVERAGE DEFLECTION △L min.		(mm)	34.0
05	INITIAL LOADING P_{ini}		(Kgs)	176.8
06	TEST DEFLECTION △		(mm)	23.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	961.0
		P_2 MAX.	(Kgs)	1043.2

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	28.9
09	EFFECTIVE NO.OF COILS	NOS	$6.1\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.5
11	PITCH	(mm)	20.1±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1261.0
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18 x 2023
14	RAW MATERIAL WEIGHT	(Kgs)	4.0
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 or ASTM A304 GR.5160H/6150H
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
03	ALTD: J.D	23.03.2020	02	ALTD: RPJ	02.12.2011
	CHKD: R.R	23.03.2020		CHKD: SM	02.12.2011
	APPD: S.M	23.03.2020		APPD: EA	02.12.2011

WIRE DIA ø13.9 WAS ø13.5, INNER COIL DIA ø42.3 WAS ø40.0 AND ITS RELATED PARAMETERS WERE REVISED RESPECTIVELY.
DCP NO.802574

NOTES UPDATED
DCP.No.801130

	NAME	SIGN	DATE
DRAWN	LRS		30.06.2001
CHECKED	VPP		30.06.2001
APPROVED	KN		30.06.2

TITLE: SPRING

DRG No. 4-V-J267-23068 REV. 03

COMP. CODE: 931720680900/964161600900

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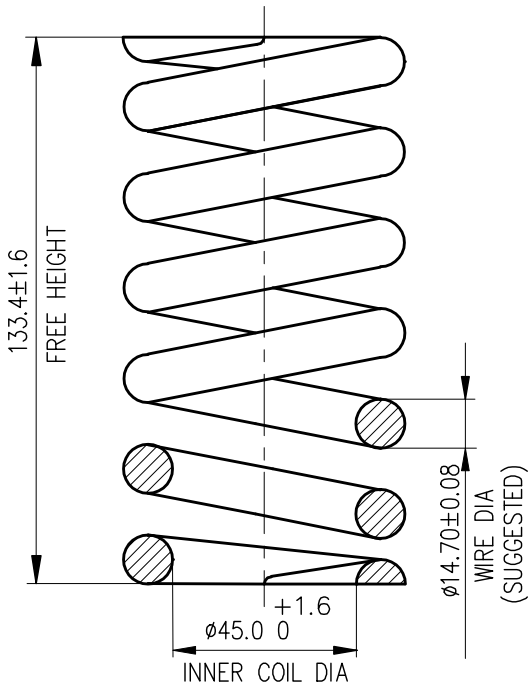

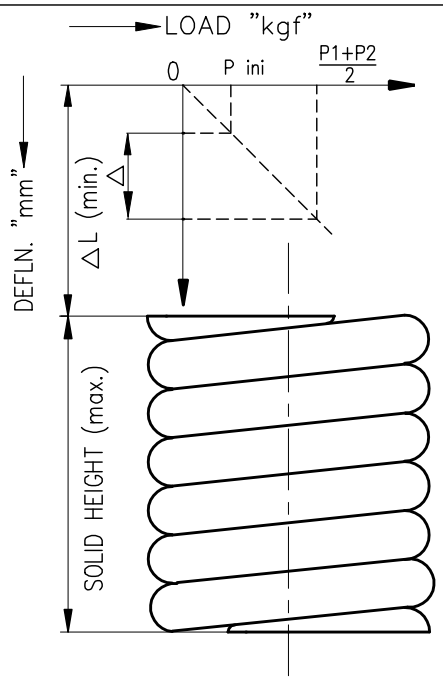

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102680CR	
02	OUTSIDE DIA MAX.LIMIT		(mm)	80.0
03	SPRING RATE		(Kg/mm)	38.834
04	AVERAGE DEFLECTION △L min.		(mm)	32.3
05	INITIAL LOADING P_{ini}		(Kgs)	187.9
06	TEST DEFLECTION △		(mm)	22.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1021.0
		P_2 MAX.	(Kgs)	1108.7

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	27.4
09	EFFECTIVE NO.OF COILS	NOS	$5.7^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.6
11	PITCH	(mm)	21.3±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1173.0
13	RAW MATERIAL DIA x LENGTH	(mm)	25 x 1720
14	RAW MATERIAL WEIGHT	(Kgs)	6.6
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (Note – 4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231 OR BS2803 GR.735A50/685A55
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: RPJ	08.07.2011
	CHKD:		CHKD: SM	08.07.2011
	APPD:		APPD: EA	08.07.2011

NOTES UPDATED
DCP.No.801130

	NAME	SIGN	DATE
DRAWN	LRS		31.03.2001
CHECKED	VPP		31.03.2001
APPROVED	KN		31.03.2001

TITLE SPRING

DRG No. 4–V–J268–23072 REV. 01

COMP. CODE: 931720720900/974529720000/964161490900

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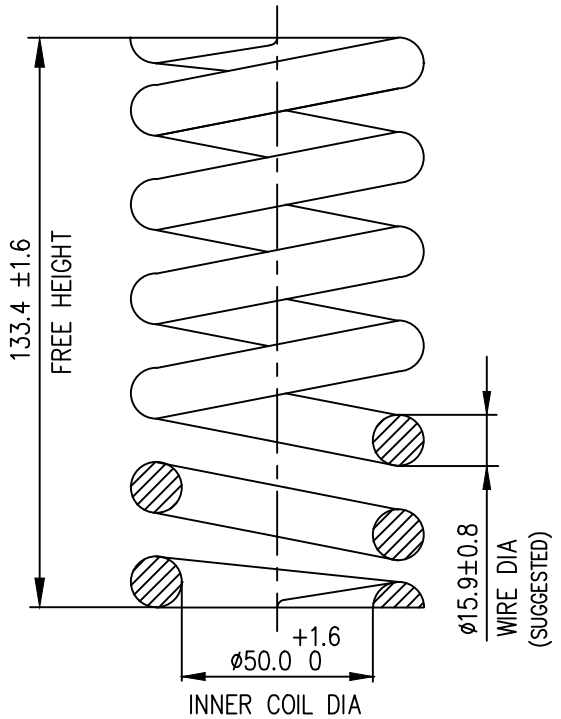

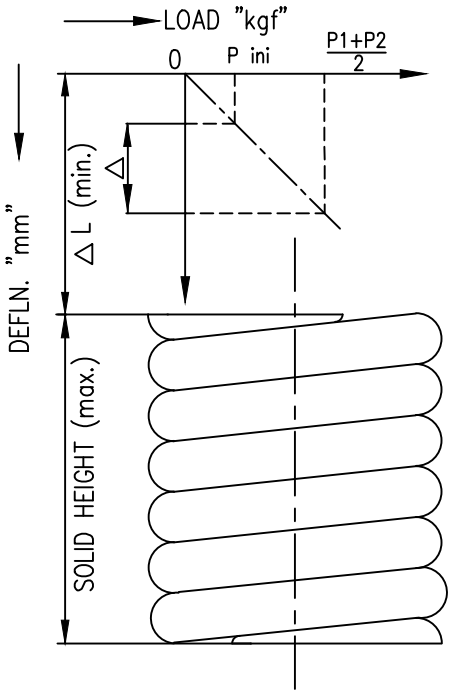

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102690CR	
02	MAX. OUTSIDE DIA		(mm)	88.9
03	SPRING RATE		(Kg/mm)	42.763
04	AVERAGE DEFLECTION △L min.		(mm)	31.8
05	INITIAL LOADING P_{ini}		(Kgs)	203.7
06	TEST DEFLECTION △		(mm)	22.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1107.0
		P_2 MAX.	(Kgs)	1202.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	27.0
09	EFFECTIVE NO. OF COILS	NOS	$5.3\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.9
11	PITCH	(mm)	22.7±0.7
12	DEVELOPED LENGTH OF ROD	(mm)	1212.0
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25 x 1770
14	RAW MATERIAL WEIGHT	(Kgs)	6.8
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401, A231
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: R.P.J	23.01.13
	CHKD:		CHKD: S.M	23.01.13
	APPD:		APPD: E.A	23.01.13

NOTES UPDATED
DCP.No.801440

BHEL 365-081

	NAME	SIGN	DATE
DRAWN	LRS		04.05.2002
CHECKED	VPP		04.05.2002
APPROVED	KN		04.05.200

TITLE: SPRING

DRG No. 4-V-J269-23057 REV. 01

COMP. CODE: 931720570900/964162080900

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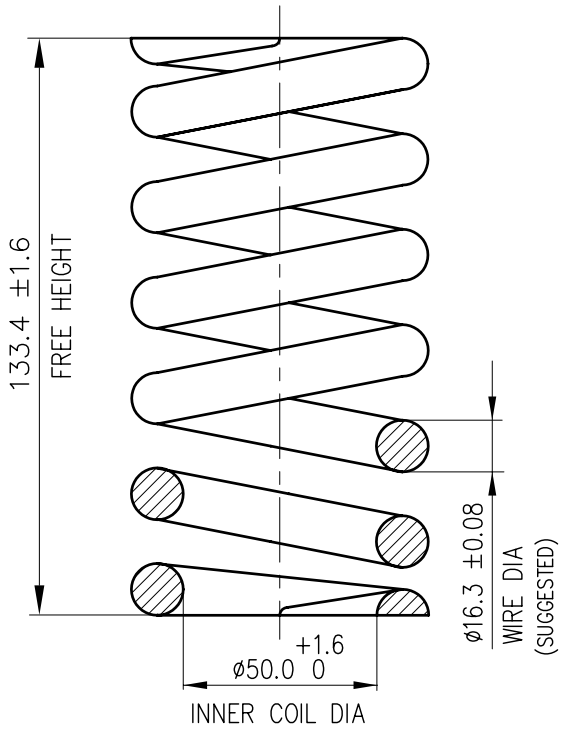

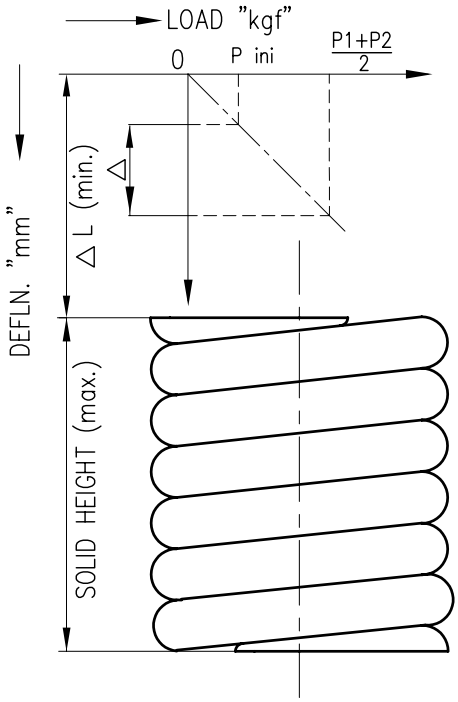

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102700CR	
02	MAX. OUTSIDE DIA		(mm)	88.9
03	SPRING RATE		(Kg/mm)	47.851
04	AVERAGE DEFLECTION △L min.		(mm)	32.8
05	INITIAL LOADING P ini		(Kgs)	235.0
06	TEST DEFLECTION △		(mm)	22.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1278.0
		P_2 MAX.	(Kgs)	1388.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	27.9
09	EFFECTIVE NO. OF COILS	NOS	$5.1\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.9
11	PITCH	(mm)	23.0±0.07
12	DEVELOPED LENGTH OF ROD	(mm)	1189.0
13	RAW MATERIAL DIA x LENGTH	(mm)	25X1700
14	RAW MATERIAL WEIGHT	(Kgs)	6.5
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 OR ASTM A304 GR.5160H/6150H.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.			NAME	SIGN	DATE
02	ALTD:	01	ALTD: G.V	29.04.10	DRAWN: LRS		12.02.2001
	CHKD:		CHKD: S.M	29.04.10	CHECKED: VPP		12.02.2001
	APPD:		APPD: E.A	29.04.10	APPROVED: KN		12.02.20

NOTES UPDATED
DCP.No.801027

TITLE: SPRING

DRG No. 4-V-J270-23051 REV. 01

COMP. CODE: 931720510900/964160360900

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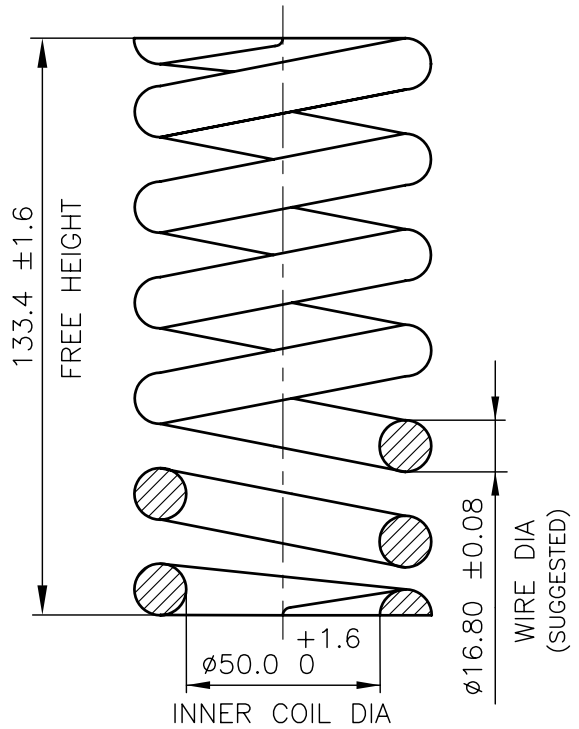

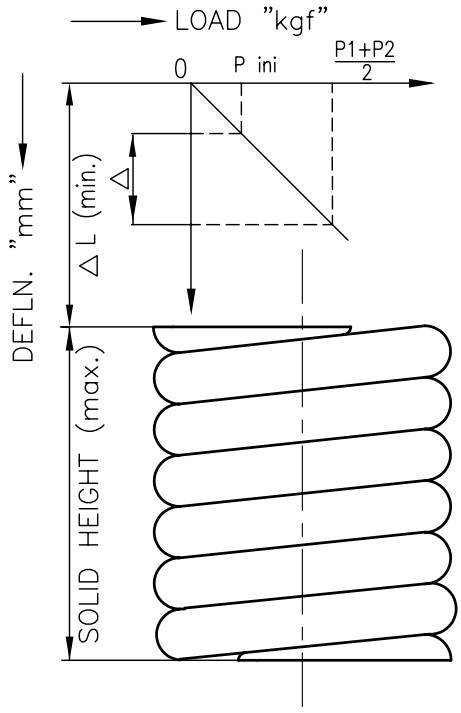

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102710CR	
02	OUTSIDE DIA MAX LIMIT		(mm)	88.9
03	SPRING RATE		(Kg/mm)	53.922
04	AVERAGE DEFLECTION △L min.		(mm)	30.7
05	INITIAL LOADING P ini		(Kgs)	249.0
06	TEST DEFLECTION △		(mm)	21.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1351.0
		P_2 MAX.	(Kgs)	1467.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	26.1
09	EFFECTIVE NO.OF COILS	NOS	$5.0\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.0
11	PITCH	(mm)	24.0±0.07
12	DEVELOPED LENGTH OF ROD	(mm)	1177.0
13	RAW MATERIAL DIA x LENGTH	(mm)	25X1700
14	RAW MATERIAL WEIGHT	(Kgs)	6.5
15	PROCESS OF MANUFACTURE	HOT COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 OR ASTM A304 GR.5160H/6150H.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.	
02	ALTD:	01	ALTD: N.T
	CHKD:	15.11.10	CHKD: R.P.J
	APPD:		APPD: E.A

NOTES UPDATED
DCP.No.801041

	NAME	SIGN	DATE
DRAWN	LRS		06.06.2001
CHECKED	VPP		06.06.2001
APPROVED	KN		06.06.20

TITLE SPRING

DRG No. 4-V-J271-23050 REV. 01

COMP. CODE: 931720500900/964160750900

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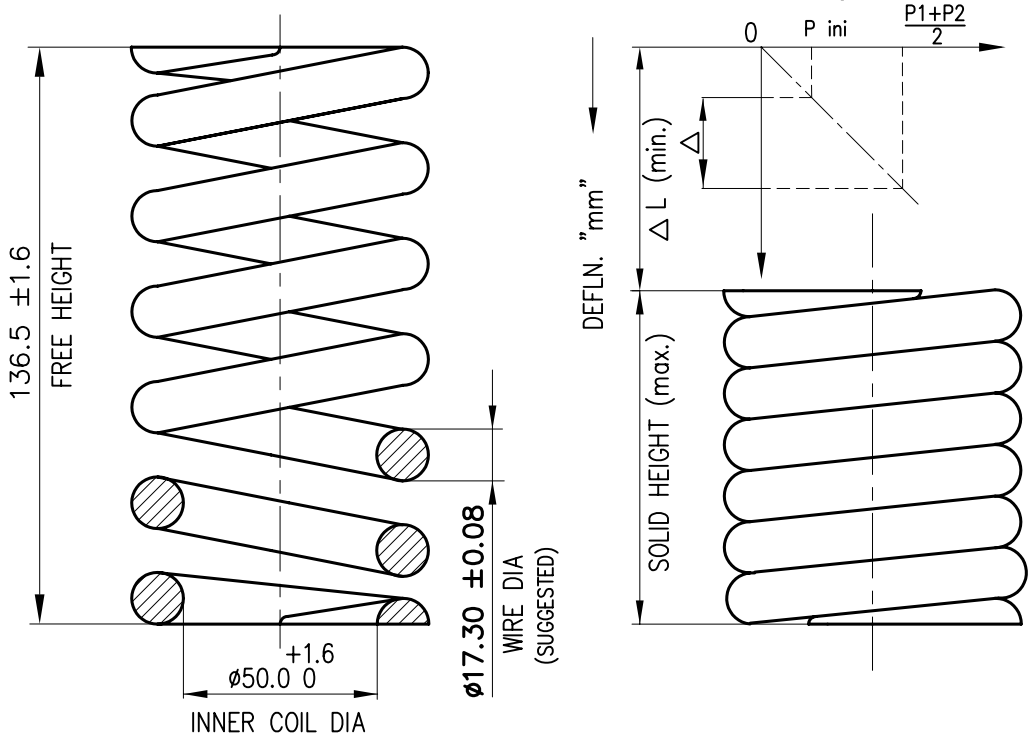

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102720CR	
02	MAX. OUTSIDE DIA		(mm)	84.2
03	SPRING RATE		(Kg/mm)	60.171
04	AVERAGE DEFLECTION Δ L min.		(mm)	31.8
05	INITIAL LOADING P ini		(Kgs)	286.6
06	TEST DEFLECTION Δ		(mm)	22.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1557.0
		P_2 MAX.	(Kgs)	1690.8
08	TILT DEFLECTION		(mm)	27.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.9^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.2
11	PITCH	(mm)	25.4 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	1172
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25x1680
14	RAW MATERIAL WEIGHT	(Kgs)	6.5
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	931723810000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.	
03	ALTD:	02	ALTD: G.V 13.02.08
	CHKD:		CHKD: E.A 13.02.08
	APPD:		APPD: E.A 13.02.08

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08.

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		13.02.08
CHECKED	E.ATHIANNAVI		13.02.08
APPROVED	E.ATHIANNAVI		13.02.(

TITLE: SPRING

DRG No. 4-V-J272-21381 REV. 02

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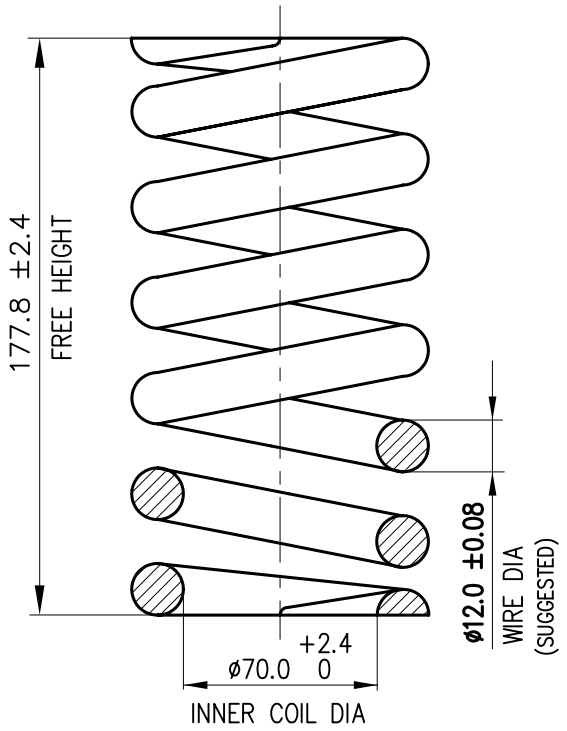

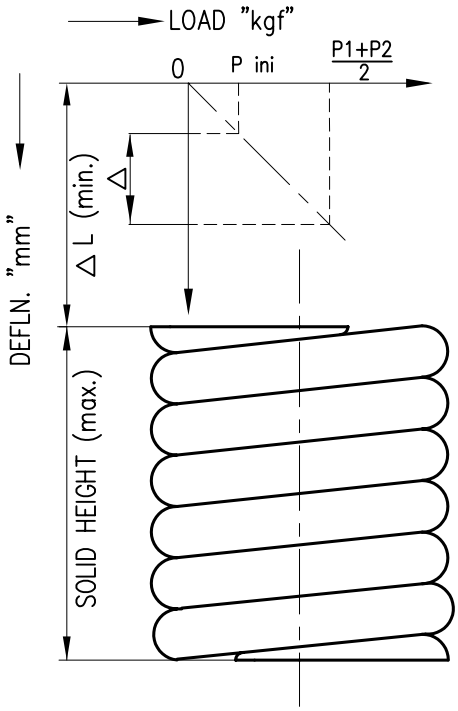

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103050CR**	
02	MAX. OUTSIDE DIA		(mm)	95.0
03	SPRING RATE		(Kg/mm)	5.839
04	AVERAGE DEFLECTION ΔL min.		(mm)	84.1
05	INITIAL LOADING P ini		(Kgs)	73.7
06	TEST DEFLECTION Δ		(mm)	58.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	400.1
		P_2 MAX.	(Kgs)	434.4
08	TILT DEFLECTION		(mm)	71.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.5^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.6
11	PITCH	(mm)	25.9 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1798
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2400
14	RAW MATERIAL WEIGHT	(Kgs)	4.8
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931723260000/ 964156750000/ 974627850000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304–6150H,ASTM A322–6150,BS970/2–735A51, BS970/2–735H51,BS2803–735A50,BS2803–685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.						
04	ALTD:	03	ALTD: G.V	25.01.08	DRAWN	G.VENKATESWARALU		25.01.08
	CHKD:		CHKD: E.A	25.01.08	CHECKED	E.ATHIANNAVI		25.01.08
	APPD:		APPD: E.A	25.01.08	APPROVED	E.ATHIANNAVI		25.01.08

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

TITLE: SPRING

DRG No. 4–V–J305–21326 REV. 03

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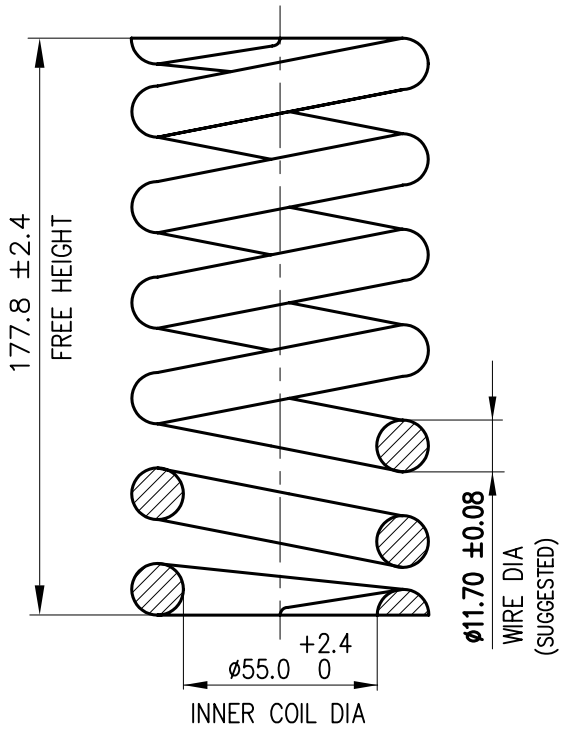

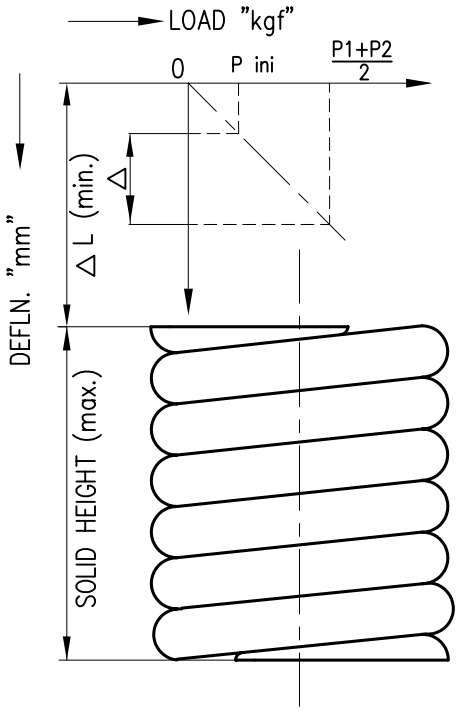

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103060CR**	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	8.204
04	AVERAGE DEFLECTION Δ L min.		(mm)	76.2
05	INITIAL LOADING P ini		(Kgs)	93.8
06	TEST DEFLECTION Δ		(mm)	53.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	509.5
		P_2 MAX.	(Kgs)	553.3
08	TILT DEFLECTION		(mm)	64.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.4
11	PITCH	(mm)	22.6 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	1708
13	RAW MATERIAL DIA x LENGTH	(mm)	ø16x2210
14	RAW MATERIAL WEIGHT	(Kgs)	3.5
15	RAW MATERIAL CODE	153274050000	
16	SPRING CODE	**931724640000/ 964156760000/ 974622480000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.				NAME	SIGN	DATE
02	ALTD:	01	ALTD: G.V	13.02.08	DRAWN	G.VENKATESWARALU		13.02.08
	CHKD:		CHKD: E.A	13.02.08	CHECKED	E.ATHIANNAVI		13.02.08
	APPD:		APPD: E.A	13.02.08	APPROVED	E.ATHIANNAVI		13.02.0

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

TITLE: SPRING

DRG No. 4-V-J306-21464 REV. 01

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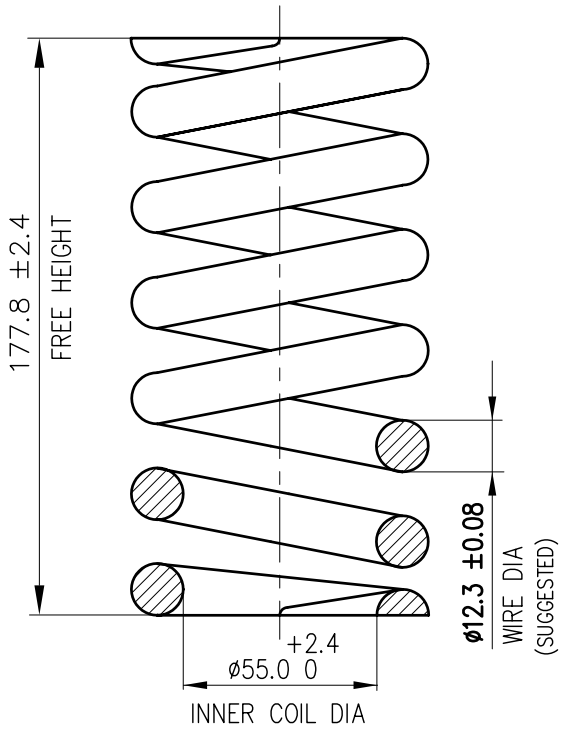
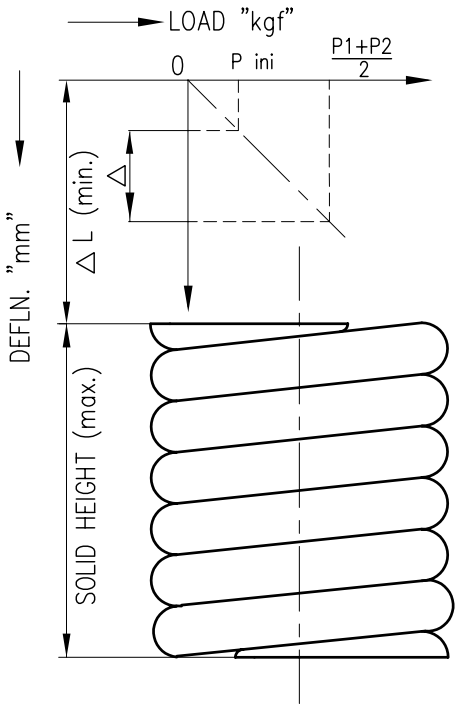
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103070CR**	
02	OUTSIDE DIA MAX. LIMIT		(mm)	92.1
03	SPRING RATE		(Kg/mm)	10.713
04	AVERAGE DEFLECTION △L min.		(mm)	73.4
05	INITIAL LOADING P ini		(Kgs)	118.0
06	TEST DEFLECTION △		(mm)	51.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	640.9
		P_2 MAX.	(Kgs)	696.0
08	TILT DEFLECTION		(mm)	62.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.1\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.5
11	PITCH	(mm)	23.7 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1589
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2200
14	RAW MATERIAL WEIGHT	(Kgs)	4.4
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**974628160000/ 964160510000/ 931726210000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	28.06.10	
	CHKD: S.M	28.06.10	
	APPD: E.A	28.06.10	

DRAWING UPDATED
DCP.No.801041

REV.			
01	ALTD: G.V	24.05.07	
	CHKD: E.A	24.05.07	
	APPD: E.A	24.05.07	

DRG. UPDATED & REDRAWN IN CAD,
DCP.NO.800666 DT.27.03.2007

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		24.05.07
CHECKED	E.Athiannavi		24.05.07
APPROVED	E.Athiannavi		24.05.0

TITLE: SPRING

DRG No. 4-V-J307-21621 REV. 02

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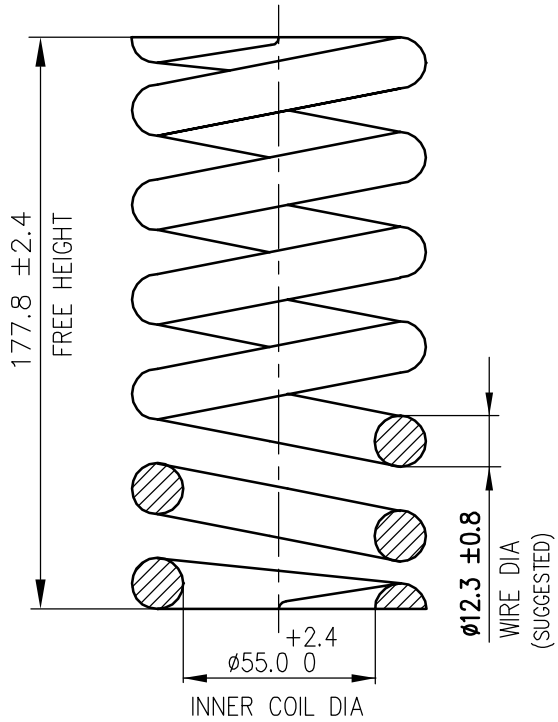

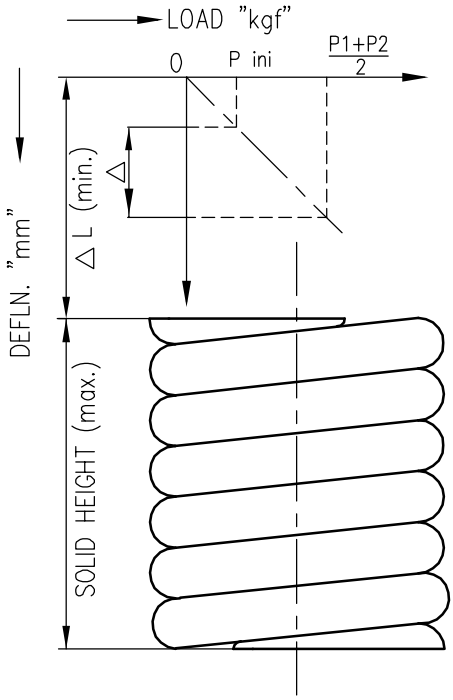

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103070CR**	
02	OUTSIDE DIA MAX. LIMIT		(mm)	92.1
03	SPRING RATE		(Kg/mm)	10.713
04	AVERAGE DEFLECTION △L min.		(mm)	73.4
05	INITIAL LOADING P ini		(Kgs)	118.0
06	TEST DEFLECTION △		(mm)	51.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	640.9
		P_2 MAX.	(Kgs)	696.0
08	TILT DEFLECTION		(mm)	62.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.1\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.5
11	PITCH	(mm)	23.7 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1589
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2200
14	RAW MATERIAL WEIGHT	(Kgs)	4.4
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322–6150/5160, A304–5160H/6150H/4161H, A401
   BS970 Pt2–735A51/735H51, BS2803–735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: G.V	13.01.12
	CHKD:		CHKD: S.M	13.01.12
	APPD:		APPD: E.A	13.01.12

NOTES UPDATED
DCN.No.801269 Dt.04.01.12

	NAME	SIGN	DATE
DRAWN	A.Paramu		10.01.03
CHECKED	K.S.Raju		10.01.03
APPROVED	K.S.Raju		10.01

TITLE
SPRING

DRG No. 4–V–J307–23621 REV. 01

COMP. CODE: 974628160900/931726210900/964160510900

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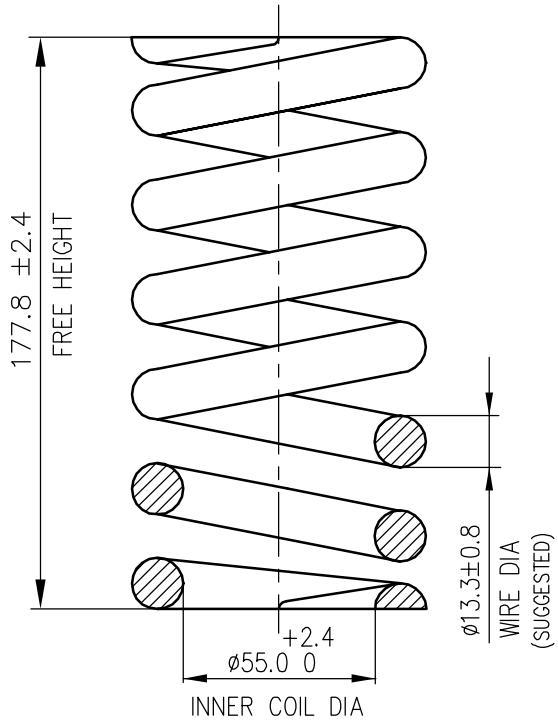

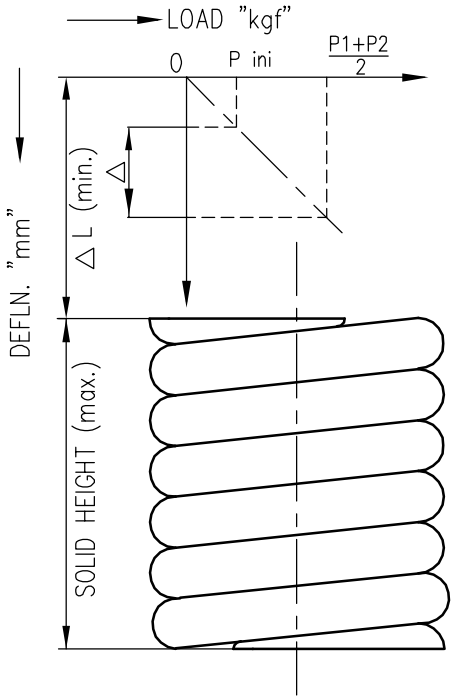

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103080CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	92.1
03	SPRING RATE		(Kg/mm)	13.106
04	AVERAGE DEFLECTION △L min.		(mm)	65.8
05	INITIAL LOADING P ini		(Kgs)	129.3
06	TEST DEFLECTION △		(mm)	46.1
07	LOAD AT TEST DEFLECTION	P1 MIN.	(Kgs)	702.7
		P2 MAX.	(Kgs)	763.0
08	TILT DEFLECTION		(mm)	55.9

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.6 $^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.9
11	PITCH	(mm)	22.8 ±1.1
12	DEVELOPED LENGTH OF ROD	(mm)	1708.0
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2220
14	RAW MATERIAL WEIGHT	(Kgs)	4.4
15	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A231,ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401 BS970 Pt2-735A51/735H51, BS2803-735A50/685A55 51CrMoV4/50CrV4/51CrV4/52CrMoV4
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: G.V	03.10.12
	CHKD:		CHKD: S.M	03.10.12
	APPD:		APPD: E.A	03.10.12

NOTES UPDATED
DCP.No.801269

365-081	NAME	SIGN	DATE
DRAWN	A..Paramu		03.12.10
CHECKED	K.S.Raju		03.12.10
APPROVED	K.S.Raju		03.1

TITLE SPRING

DRG No. 4-V-J308-23475 REV. 01

COMP. CODE: 931724750900/964161940900/974628960900

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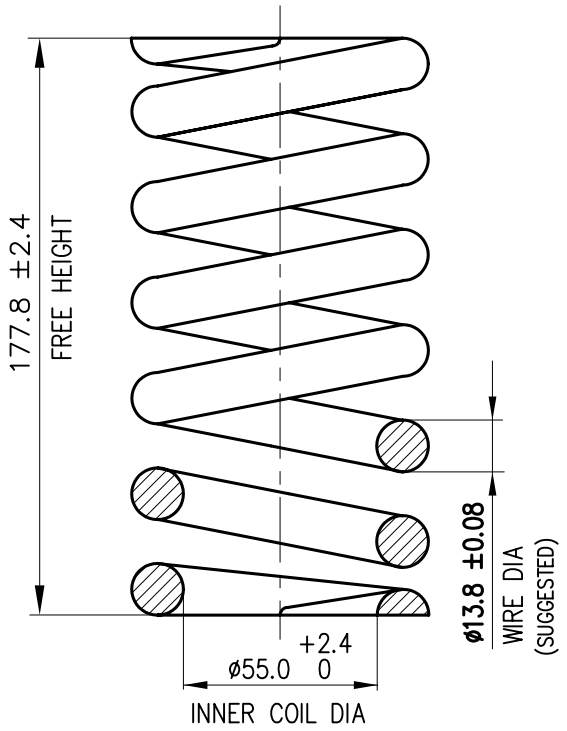
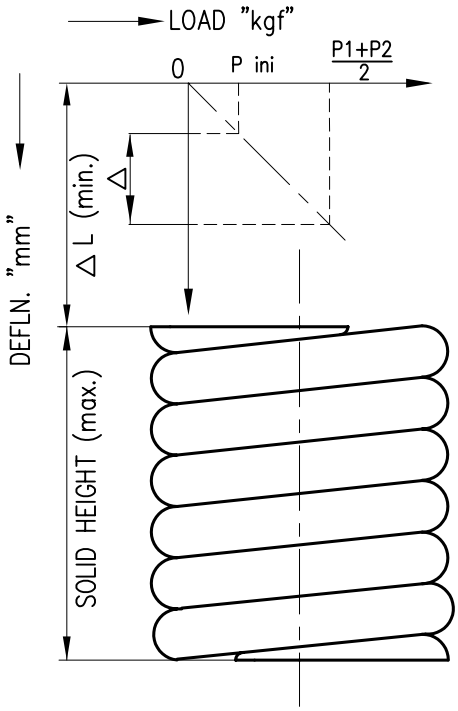
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103090CR**	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	15.498
04	AVERAGE DEFLECTION Δ L min.		(mm)	66.0
05	INITIAL LOADING P ini		(Kgs)	153.5
06	TEST DEFLECTION Δ		(mm)	46.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	834.2
		P_2 MAX.	(Kgs)	905.8
08	TILT DEFLECTION		(mm)	56.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.3^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.9
11	PITCH	(mm)	23.7 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1659
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2170
14	RAW MATERIAL WEIGHT	(Kgs)	4.3
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931722000000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.					
03	ALTD:	REV. 02	ALTD: G.V	25.01.08	
	CHKD:		CHKD: E.A	25.01.08	
	APPD:		APPD: E.A	25.01.08	

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		25.01.08
CHECKED	E.ATHIANNAVI		25.01.08
APPROVED	E.ATHIANNAVI		25.01.[illegible]

TITLE: SPRING

DRG No. 4-V-J309-21200 REV. 02

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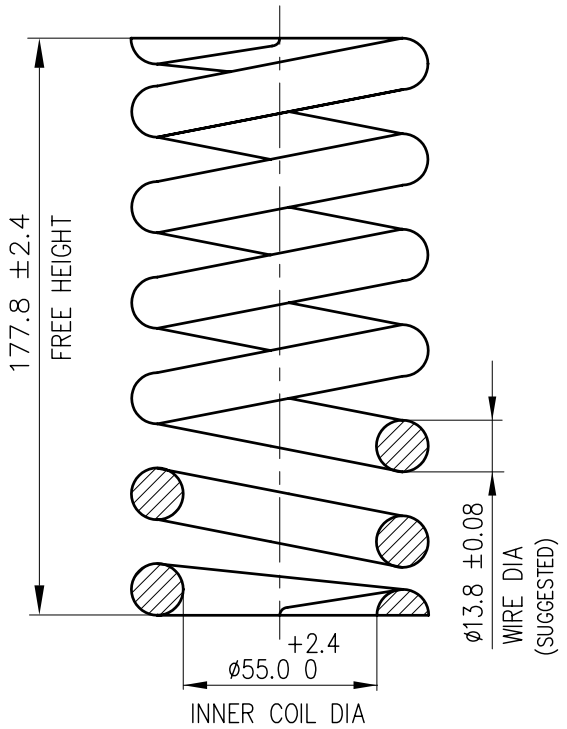

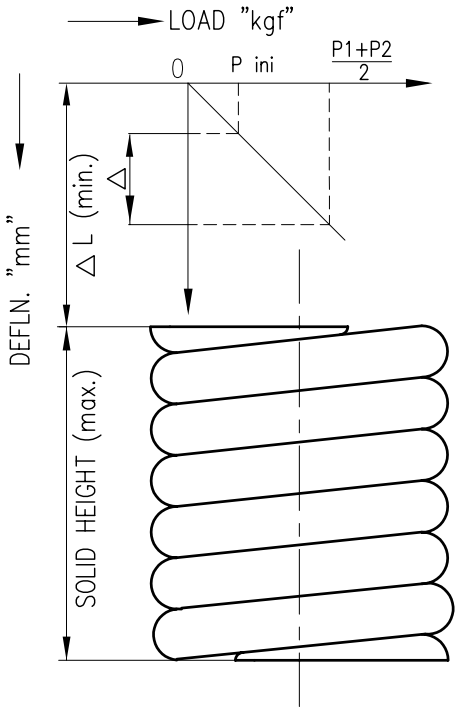

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103090CR	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	15.498
04	AVERAGE DEFLECTION △L min.		(mm)	66.0
05	INITIAL LOADING Pini		(Kgs)	153.5
06	TEST DEFLECTION △		(mm)	46.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	834.2
		P_2 MAX.	(Kgs)	905.8
08	TILT DEFLECTION		(mm)	56.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.3 $^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.9
11	PITCH	(mm)	23.7 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1659
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2170
14	RAW MATERIAL WEIGHT	(Kgs)	4.3
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 OR ASTM A304 GR.5160H/6150H.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: G.V	04.06.10
	CHKD:		CHKD: S.M	04.06.10
	APPD:		APPD: E.A	04.06.10

NOTES UPDATED
DCN.No.801041

	NAME	SIGN	DATE
DRAWN	A.P.Sivam		18.03.04
CHECKED	E.Athiannavi		18.03.0
APPROVED	E.Athiannavi		18.03.0

TITLE: SPRING

DRG No. 4-V-J309-23200 REV. 01

COMP. CODE: 931722000900/964160410900

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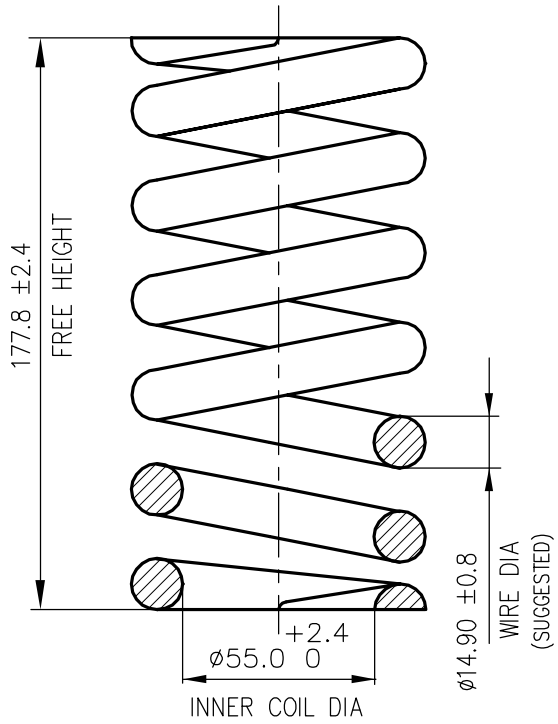

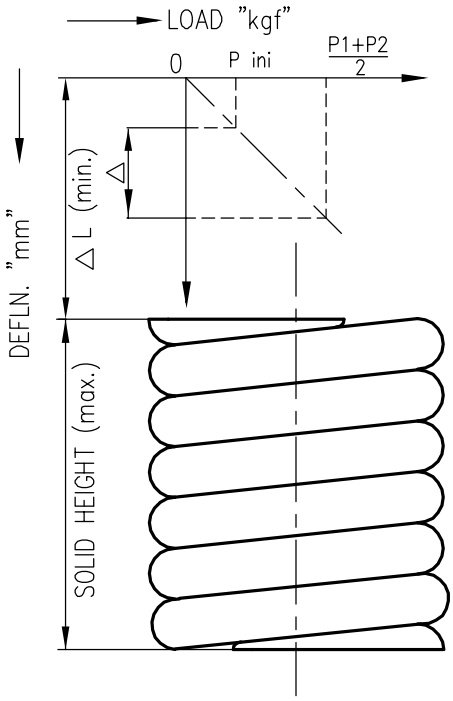

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103110CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	92.1
03	SPRING RATE (± 4%)		(Kg/mm)	20.319
04	SOLID DEFLECTION △L min.		(mm)	58.1
05	INITIAL LOADING P ini		(Kgs)	177.0
06	TEST DEFLECTION △		(mm)	40.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	961.5
		P_2 MAX.	(Kgs)	1044.1
08	TILT DEFLECTION		(mm)	49.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.2\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.3
11	PITCH	(mm)	23.8±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1665
13	RAW MATERIAL DIA x LENGTH	(mm)	25X2180
14	RAW MATERIAL WEIGHT	(Kgs)	8.4
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATION ONLY.
2. FREE HEIGHT, SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY VENDOR, ACCORDING TO THE MATERIAL SELECTED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401, A231
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.				REV.			
02	ALTD: G.V	11.11.14		01	ALTD: G.V	23.05.13
	CHKD: S.M	11.11.14			CHKD: S.M	23.05.13
	APPD: E.A	11.11.14			APPD: E.A	23.05.13

NOTES UPDATED
DCN.No.801682

NOTES UPDATED
DCP.No.801440

	NAME	SIGN	DATE
DRAWN	L.R.S		05.09.2001
CHECKED	V.P.P		05.09.2001
APPROVED	K.N		05.09.2

365-081

TITLE
SPRING

DRG No. 4-V-J311-23359 REV. 02

COMP. CODE: 931723590900/974423570900

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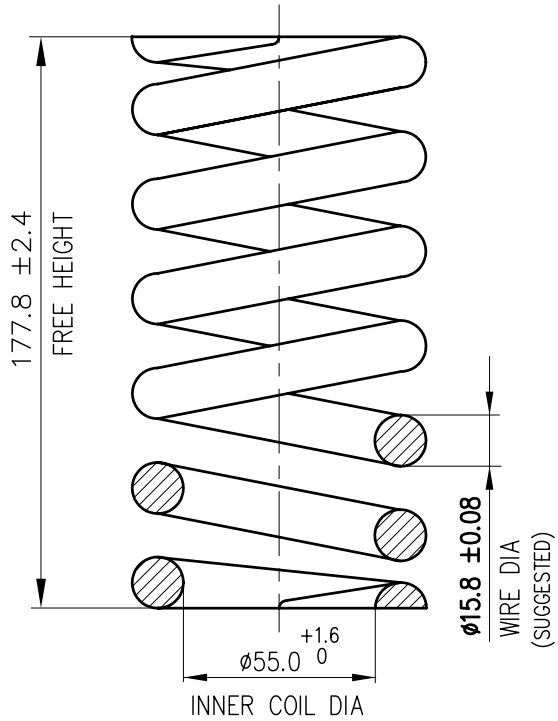

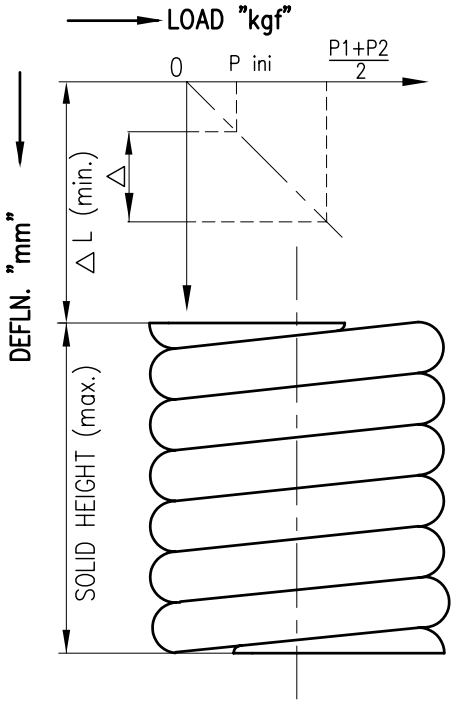

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103130CR	
02	OUTSIDE DIA MAX. LIMIT		mm	92.1
03	SPRING RATE		Kg/mm	26.086
04	AVERAGE DEFLECTION △L min.		mm	54.6
05	INITIAL LOADING P ini		Kg	213.7
06	TEST DEFLECTION △		mm	38.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	1161.0
		P_2 MAX.	Kg	1260.7
08	TILT DEFLECTION		mm	46.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.8^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	2.5
11	PITCH	mm	24.8±1.0
12	DEVELOPED LENGTH OF ROD	mm	1614
13	RAW MATERIAL DIA x LENGTH	mm	ø18x2180
14	RAW MATERIAL WEIGHT	Kg	4.4
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931721480000/ 964160940000/ 974620390000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	09.02.11	NOTES UPDATED DCN.No.801130 Dt.03.01.11
	CHKD: S.M	09.02.11	
	APPD: E.A	09.02.11	

REV.			
01	ALTD: MRC		RETRACED & UPDATED DCN: SR: 0189 Dt.07.07.97
	CHKD: KSR		
	APPD: KSR		

	NAME	SIGN	DATE
DRAWN	MRC		07.07.97
CHECKED	KSR		07.07.97
APPROVED	KSR		07.0

TITLE: SPRING

DRG No. 4-V-J313-21148 REV. 02

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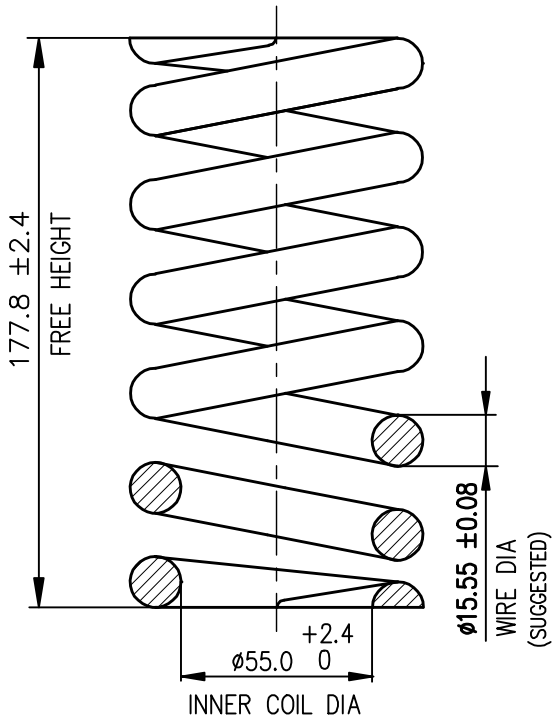

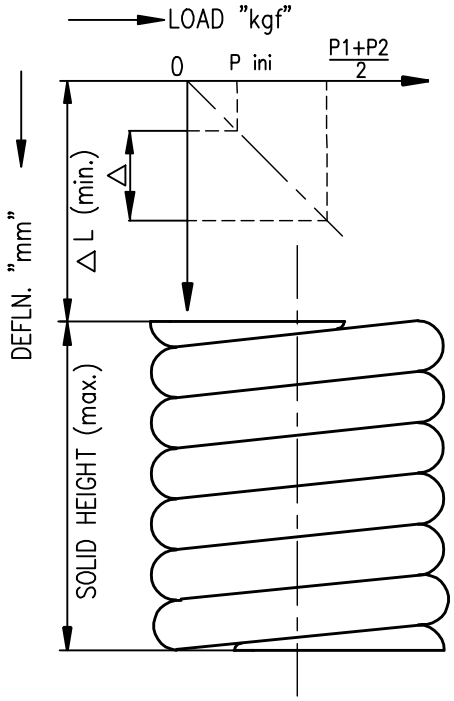

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0303130CR	
02	MAX. OUTSIDE DIA		(mm)	98.4
03	SPRING RATE		(Kg/mm)	24.39
04	AVERAGE DEFLECTION △L min.		(mm)	56.6
05	INITIAL LOADING P_{ini}		(Kgs)	207.2
06	TEST DEFLECTION △		(mm)	39.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1125.9
		P_2 MAX.	(Kgs)	1222.6
08	TILT DEFLECTION		(mm)	48.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.9^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.427
11	PITCH	(mm)	24.5 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1628
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2140
14	RAW MATERIAL WEIGHT	(Kgs)	4.275
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931723750000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	16.06.09
	CHKD:		CHKD: S.M	16.06.09
	APPD:		APPD: E.A	16.06.09

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800903 DT.21.01.09

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		16.06.09
CHECKED	S.Madhulingam		16.06.09
APPROVED	E.Athiannavi		16.06.0

TITLE: SPRING

DRG No. 4–V–J313–21375 REV. 01

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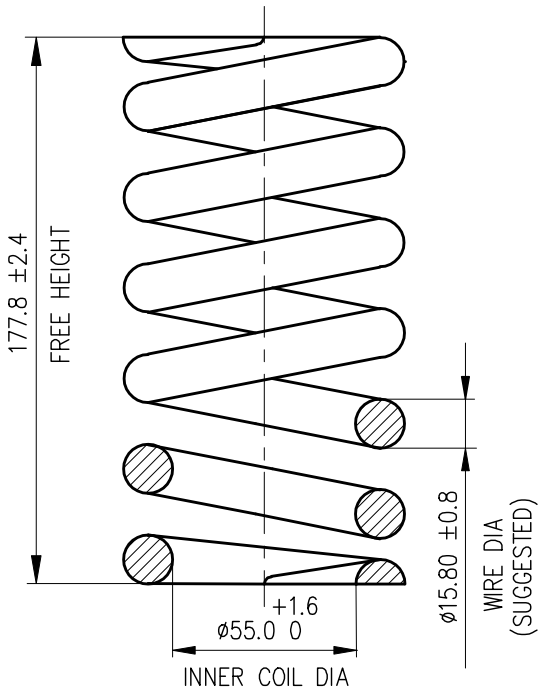

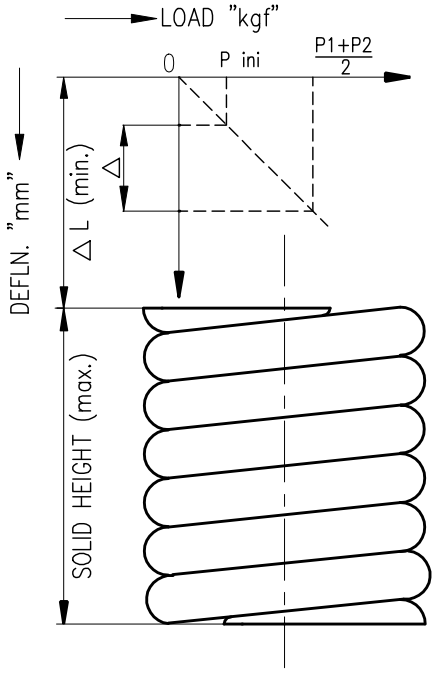

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103130CR	
02	OUTSIDE DIA.MAX.LIMIT		(mm)	92.1
03	SPRING RATE		(Kg/mm)	26.086
04	AVERAGE DEFLECTION △L min.		(mm)	54.6
05	INITIAL LOADING P_{ini}		(Kgs)	213.7
06	TEST DEFLECTION △		(mm)	38.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1161.0
		P_2 MAX.	(Kgs)	1260.7

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	46.4
09	EFFECTIVE NO.OF COILS	NOS	$6.8\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.5
11	PITCH	(mm)	24.8±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1614
13	RAW MATERIAL DIA x LENGTH	(mm)	18 x 2180
14	RAW MATERIAL WEIGHT	(Kgs)	4.4
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 or ASTM A304 GR.5160H/6150H
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: RPJ	09.12.2011
	CHKD:		CHKD: SM	09.12.2011
	APPD:		APPD: E.A	09.12.2011

NOTES UPDATED
DCP.No.801130

	NAME	SIGN	DATE
DRAWN	AP		02.07.2004
CHECKED	EA		02.07.2004
APPROVED	EA		02.07.2004

TITLE SPRING

DRG No. 4-V-J313-23148 REV. 01

COMP. CODE: 931721480900/964160940900

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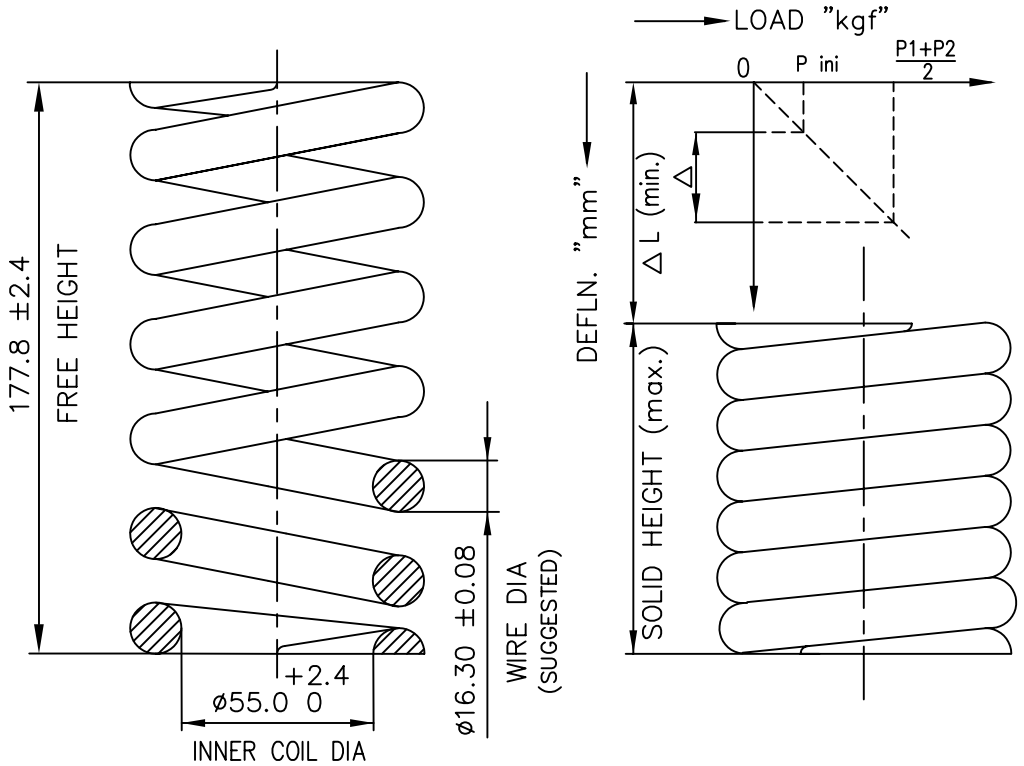

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103140CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	92.1
03	SPRING RATE		(Kg/mm)	29.818
04	AVERAGE DEFLECTION ΔL min.		(mm)	54.4
05	INITIAL LOADING P_{ini}		(Kgs)	244.0
06	TEST DEFLECTION Δ		(mm)	38.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1321.0
		P_2 MAX.	(Kgs)	1435.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	46.2
09	EFFECTIVE NO.OF COILS	NOS	$6.6\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.6
11	PITCH	(mm)	26.0±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1585
13	RAW MATERIAL DIA x LENGTH	(mm)	25 x 2100
14	RAW MATERIAL WEIGHT	(Kgs)	8.0
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 or ASTM A304 GR.5160H/6150H
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: RPJ	25.02.2011
	CHKD:		CHKD: VPP	25.02.2011
	APPD:		APPD: E.A	25.02.2011

NOTES UPDATED
DCP.No.801130

	NAME	SIGN	DATE
DRAWN	LRS		04.04.2002
CHECKED	VPP		04.04.2002
APPROVED	KN		04.04.

TITLE SPRING

DRG No. 4-V-J314-23038 REV. 01

COMP. CODE: 931720380900/964161240900

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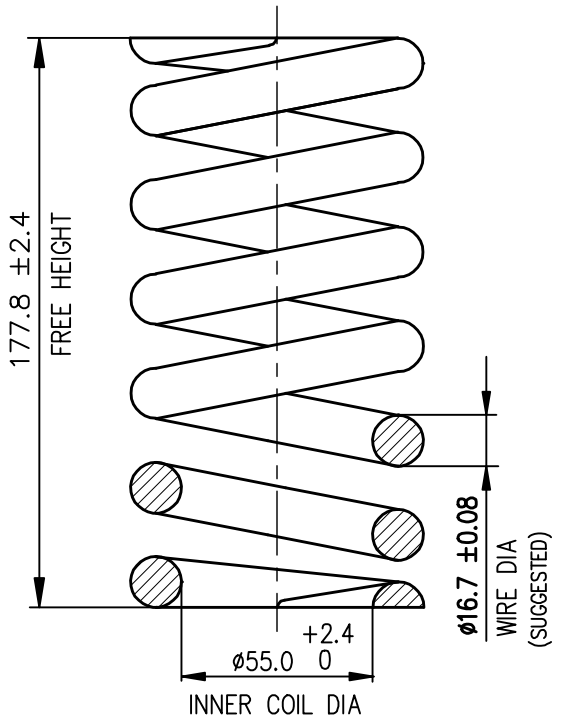

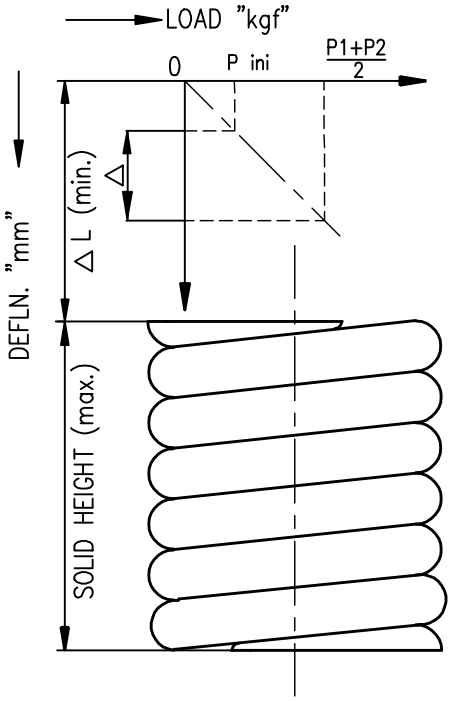

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0303150CR	
02	MAX. OUTSIDE DIA		(mm)	98.4
03	SPRING RATE		(Kg/mm)	31.603
04	AVERAGE DEFLECTION △L min.		(mm)	50.5
05	INITIAL LOADING P_{ini}		(Kgs)	239.6
06	TEST DEFLECTION △		(mm)	35.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1301.9
		P_2 MAX.	(Kgs)	1413.7
08	TILT DEFLECTION		(mm)	43.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.79
11	PITCH	(mm)	24.8 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1623
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25x2140
14	RAW MATERIAL WEIGHT	(Kgs)	8.246
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	931725550000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	27.05.09
	CHKD:		CHKD: S.M	27.05.09
	APPD:		APPD: E.A	27.05.09

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800903 DT.21.01.09

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		27.05.09
CHECKED	S.Madhulingam		27.05.09
APPROVED	E.Athiannavi		27.05.0

TITLE: SPRING

DRG No. 4–V–J315–21555 REV. 01

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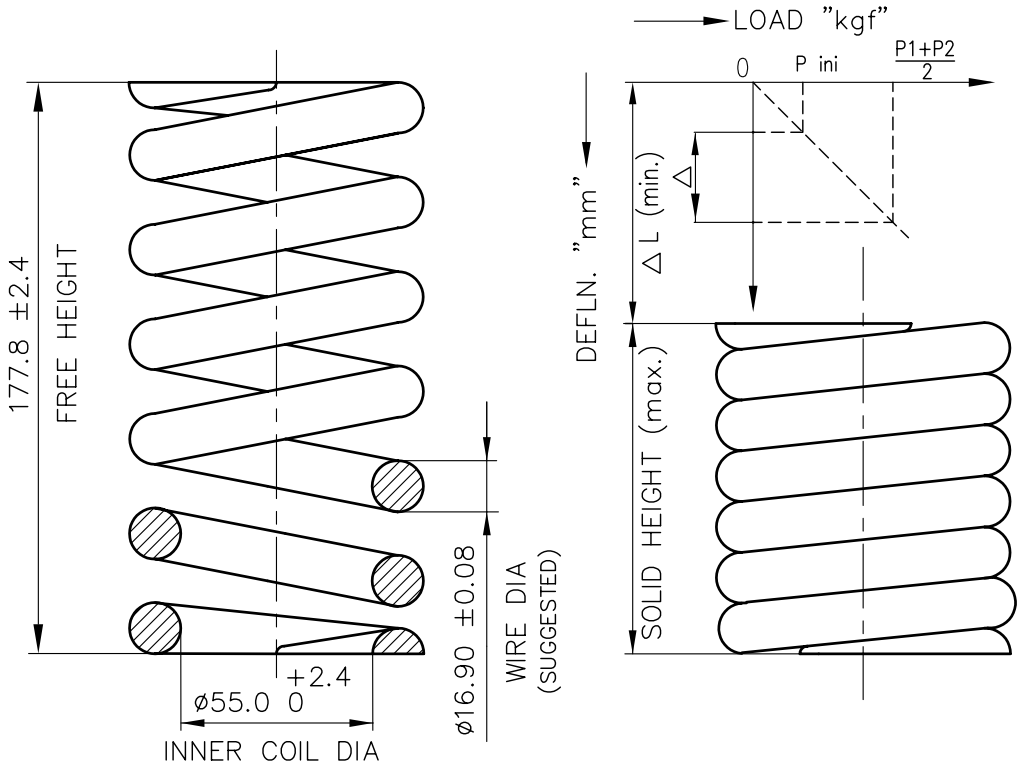

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103150CR	
02	OUTSIDE DIA MAX.LIMIT		(mm)	92.1
03	SPRING RATE		(Kg/mm)	33.389
04	AVERAGE DEFLECTION Δ L min.		(mm)	49.8
05	INITIAL LOADING P ini		(Kgs)	249.3
06	TEST DEFLECTION Δ		(mm)	34.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1354.7
		P_2 MAX.	(Kgs)	1471.1

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	42.3
09	EFFECTIVE NO.OF COILS	NOS	$6.7\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.83
11	PITCH	(mm)	25.1±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1606.0
13	RAW MATERIAL DIA x LENGTH	(mm)	25X2120
14	RAW MATERIAL WEIGHT	(Kgs)	8.2
15	PROCESS OF MANUFACTURE	HOT COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 OR ASTM A304 GR.5160H/6150H.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: RPJ	01.12.2010	01	ALTD: LRS	22.02.2002
	CHKD: VPP	01.12.2010		CHKD: VPP	22.02.2002
	APPD: E.A	01.12.2010		APPD: KN	22.02.2002

NOTES UPDATED
DCP.No.801041

RAW MATERIAL CODE
153274090000 WAS 15026207
DCP NO.800026

	NAME	SIGN	DATE
DRAWN	LRS		23.01.2001
CHECKED	VPP		23.01.2001
APPROVED	KN		23.01.

TITLE: SPRING

DRG No. 4-V-J315-23316 REV. 02

COMP. CODE: 931723160900/964160150900

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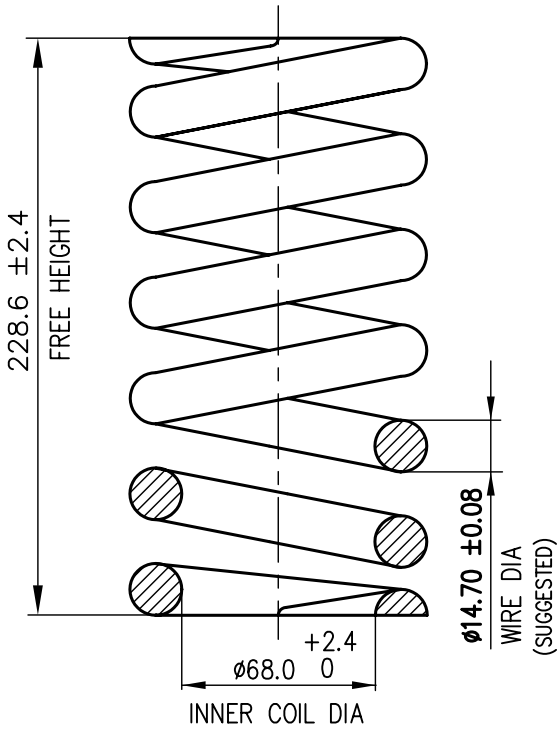

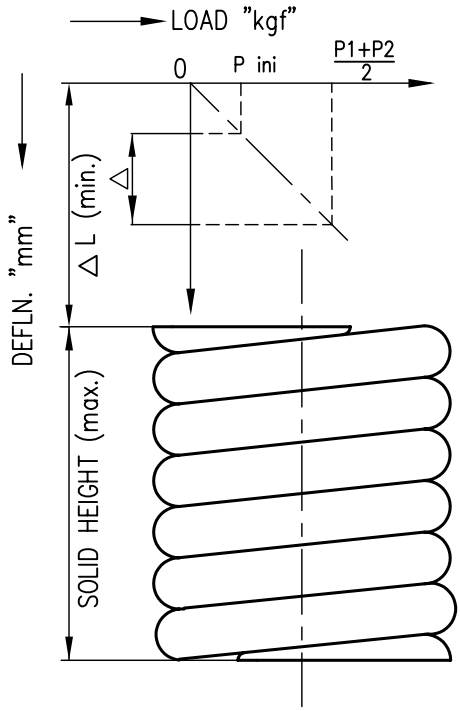

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103850CR**	
02	MAX. OUTSIDE DIA		(mm)	123.8
03	SPRING RATE		(Kg/mm)	10.106
04	AVERAGE DEFLECTION △L min.		(mm)	94.5
05	INITIAL LOADING P ini		(Kgs)	143.2
06	TEST DEFLECTION △		(mm)	66.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	778.2
		P_2 MAX.	(Kgs)	845.1
08	TILT DEFLECTION		(mm)	80.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$8.3^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	3.0
11	PITCH	(mm)	27.3 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2235
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2770
14	RAW MATERIAL WEIGHT	(Kgs)	5.5
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931721940000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
02	ALTD: G.V	22.01.09	01	ALTD:	MRC
	CHKD: E.A	22.01.09		CHKD:	KSR
	APPD: E.A	22.01.09		APPD:	KSR

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800903 DT.21.01.09

RETRACED AND UPDATED
DCN NO. SR:0189 DT.07.07.97

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		22.01.09
CHECKED	E.Athiannavi		22.01.09
APPROVED	E.Athiannavi		22.01.0

TITLE: SPRING

DRG No. 4-V-J385-21194 REV. 02

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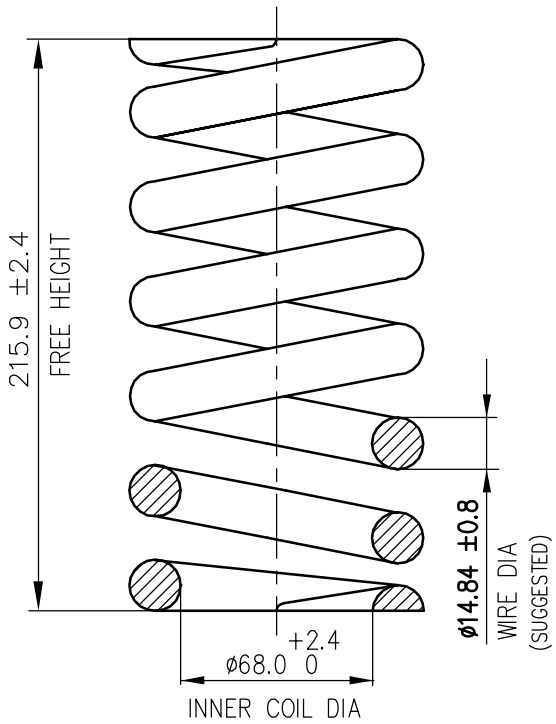

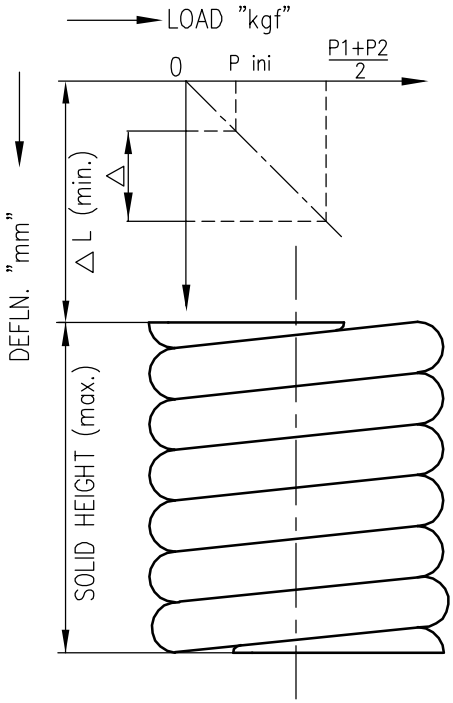

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104060CR	
02	OUTSIDE DIA MAX. LIMIT		(mm)	101.6
03	SPRING RATE		(Kg/mm)	11.070
04	AVERAGE DEFLECTION △L min.		(mm)	87.4
05	INITIAL LOADING P ini		(Kgs)	145.1
06	TEST DEFLECTION △		(mm)	61.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	788.3
		P_2 MAX.	(Kgs)	856.0
08	TILT DEFLECTION		(mm)	74.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.882
11	PITCH	(mm)	27.2 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2123
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2650
14	RAW MATERIAL WEIGHT	(Kgs)	5.294
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931726350000/ 974529290000/ 964162110000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NONIBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401, A231
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V		16.02.13
	CHKD: S.M		16.02.13
	APPD: E.A		16.02.13

REV.			
01	ALTD: G.V		30.03.07
	CHKD: E.A		30.03.07
	APPD: E.A		30.03.07

NOTES UPDATED
DCP.No.801440

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800666 DT.30.03.2007

भेल BHEL 365-081

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		30.03.07
CHECKED	E.ATHIANNAVI		30.03.07
APPROVED	E.ATHIANNAVI		30.03.07

TITLE: SPRING

DRG No. 4-V-J406-21635 REV. 02

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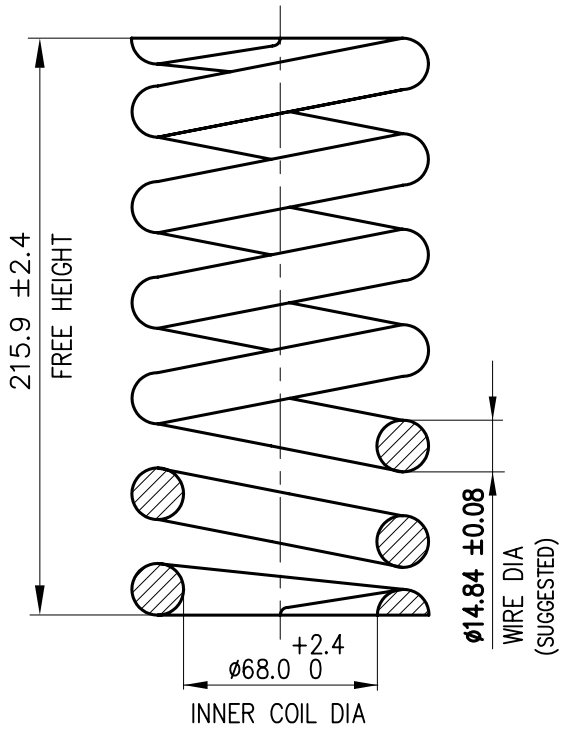

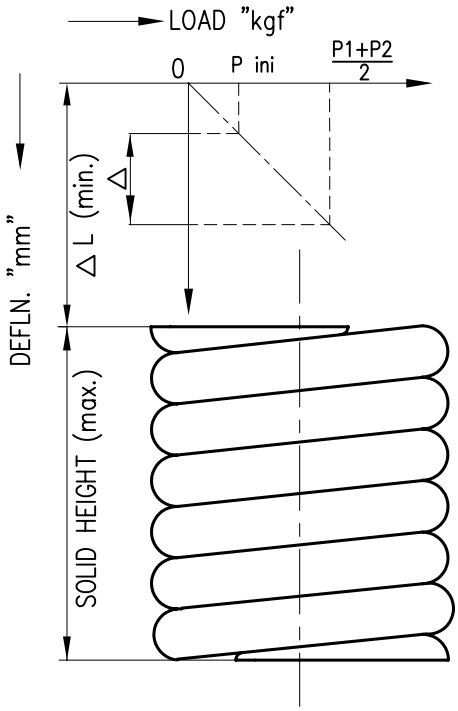

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0104060CR**	
02	MAX. OUTSIDE DIA		(mm)	101.6
03	SPRING RATE		(Kg/mm)	11.070
04	AVERAGE DEFLECTION ΔL min.		(mm)	87.4
05	INITIAL LOADING P_{ini}		(Kgs)	145.1
06	TEST DEFLECTION Δ		(mm)	61.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	788.3
		P_2 MAX.	(Kgs)	856.0
08	TILT DEFLECTION		(mm)	74.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.882
11	PITCH	(mm)	27.2 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2123
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2650
14	RAW MATERIAL WEIGHT	(Kgs)	5.294
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931726350900**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		23.01.08
CHECKED	E.ATHIANNAVI		23.01.08
APPROVED	E.ATHIANNAVI		23.01.0

TITLE: SPRING

DRG No. 4-V-J406-23635 REV. 00

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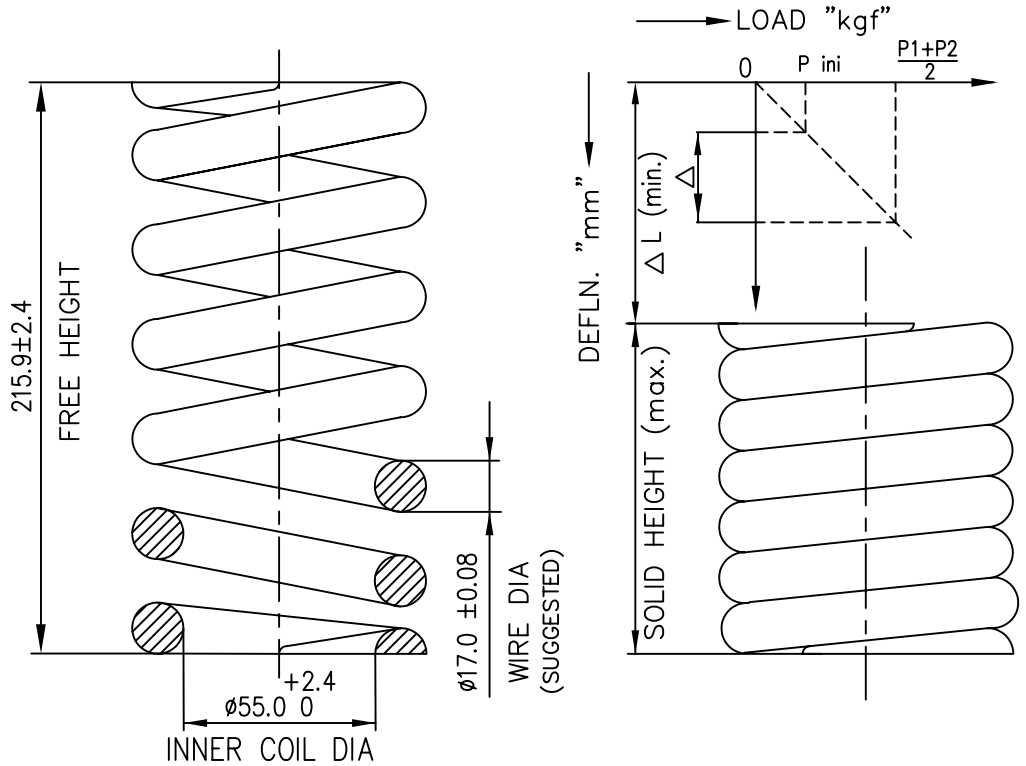

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104110CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	101.6
03	SPRING RATE		(Kg/mm)	27.318
04	AVERAGE DEFLECTION ΔL min.		(mm)	62.0
05	INITIAL LOADING P_{ini}		(Kgs)	254.0
06	TEST DEFLECTION Δ		(mm)	43.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1379.9
		P_2 MAX.	(Kgs)	1498.4

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	52.7
09	EFFECTIVE NO.OF COILS	NOS	$8.3\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	3.5
11	PITCH	(mm)	25.2 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1948.0
13	RAW MATERIAL DIA x LENGTH	(mm)	25 x 2460
14	RAW MATERIAL WEIGHT	(Kgs)	9.5
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 OR ASTM A304 GR.5160H/6150H.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: RPJ	30.05.11	01	ALTD: G.V	19.08.06
	CHKD: RPJ	30.05.11		CHKD: E.A	19.08.06
	APPD: E.A	30.05.11		APPD: E.A	19.08.06

NOTES UPDATED
DCP. NO. 801130

DRG. UPDATED & REDRAWN IN CAD.
DCP. NO. 800602 DT.01.08.06

	NAME	SIGN	DATE
DRAWN	A.Paramu		22.11.2002
CHECKED	K.S.Raju		22.11.
APPROVED	K.S.Raju		22.11.

TITLE: SPRING

DRG No. 4-V-J411-23362 REV. 02

COMP. CODE: 931723620900/964161110900

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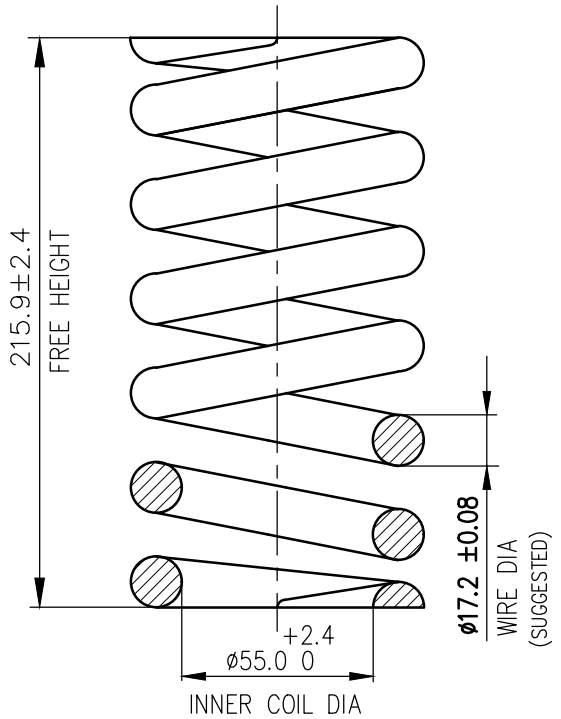

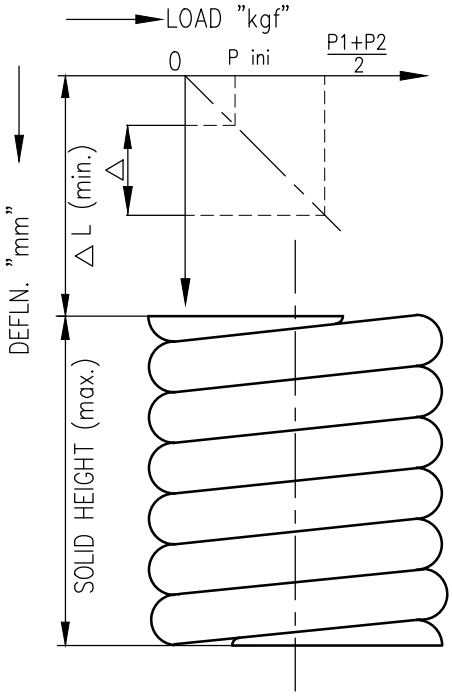

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104120NC	
02	MAX. OUTSIDE DIA		(mm)	101.6
03	SPRING RATE		(Kg/mm)	30.532
04	AVERAGE DEFLECTION △L min.		(mm)	62.6
05	INITIAL LOADING P_{ini}		(Kgs)	286.7
06	TEST DEFLECTION △		(mm)	43.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1558.0
		P_2 MAX.	(Kgs)	1691.2
08	TILT DEFLECTION		(mm)	53.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	3.7
11	PITCH	(mm)	25.8 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2023
13	RAW MATERIAL DIA x LENGTH	(mm)	–
14	RAW MATERIAL WEIGHT	(Kgs)	–
15	RAW MATERIAL CODE	–	
16	SPRING CODE	964165760000	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A564–631 (17–7 PH) HARDNESS 42 TO 46 HRC.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

365–081/A
08.09.2020

	NAME	SIGN	DATE
DRAWN	J.DHANABAL		07.07.2022
CHECKED	R.RABIN		07.07.2022
APPROVED	S.MADHULINGAM		07.07.20

TITLE: SPRING

DRG No. 4–V–J412–21914 REV. 00

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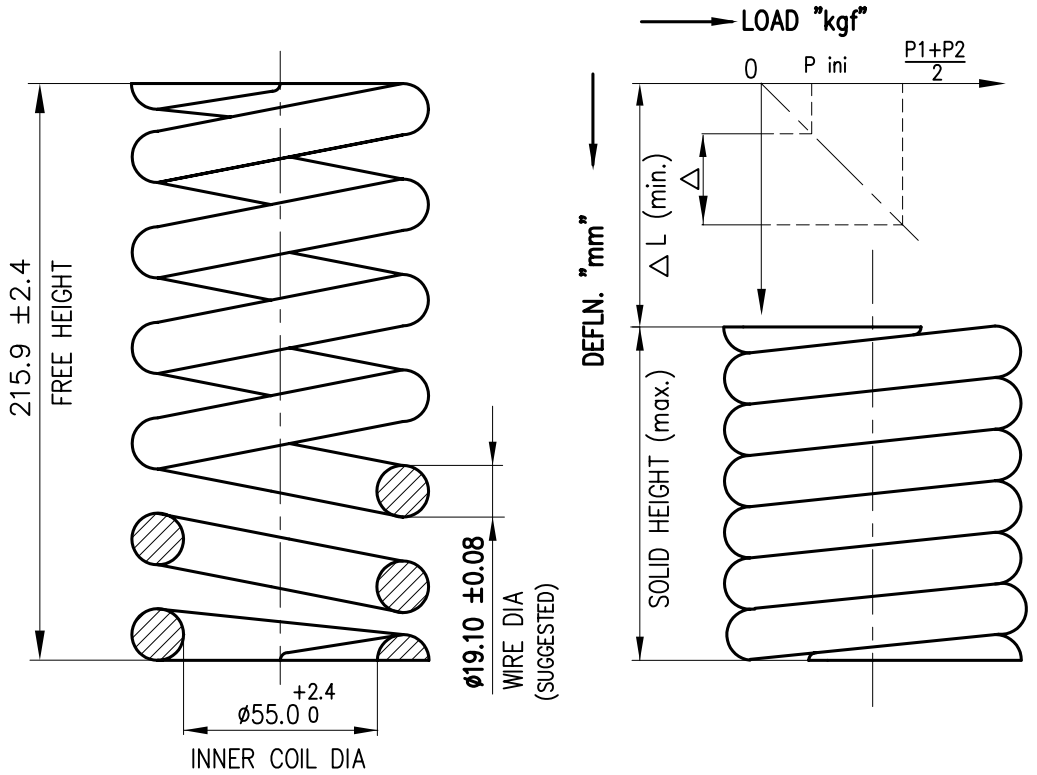

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0104150CR**	
02	MAX. OUTSIDE DIA		mm	101.6
03	SPRING RATE		Kg/mm	44.994
04	AVERAGE DEFLECTION Δ L min.		mm	61.5
05	INITIAL LOADING P ini		Kg	415.4
06	TEST DEFLECTION Δ		mm	43.1
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	2256.9
		P_2 MAX.	Kg	2450.7
08	TILT DEFLECTION		mm	52.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.4 $^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	4.1
11	PITCH	mm	27.9 ±0.9
12	DEVELOPED LENGTH OF ROD	mm	1807
13	RAW MATERIAL DIA x LENGTH	mm	ø25x2370
14	RAW MATERIAL WEIGHT	Kg	9.2
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931720750000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.						
06	ALTD:	05	ALTD: G.V	12.02.08	DRAWN	G.VENKATESWARALU		12.02.08
	CHKD:		CHKD: E.A	12.02.08	CHECKED	E.ATHIANNAVI		12.02.08
	APPD:		APPD: E.A	12.02.08	APPROVED	E.ATHIANNAVI		12.02.0

NAME SIGN DATE

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08.

TITLE: SPRING

DRG No. 4–V–J415–21075 REV. 05

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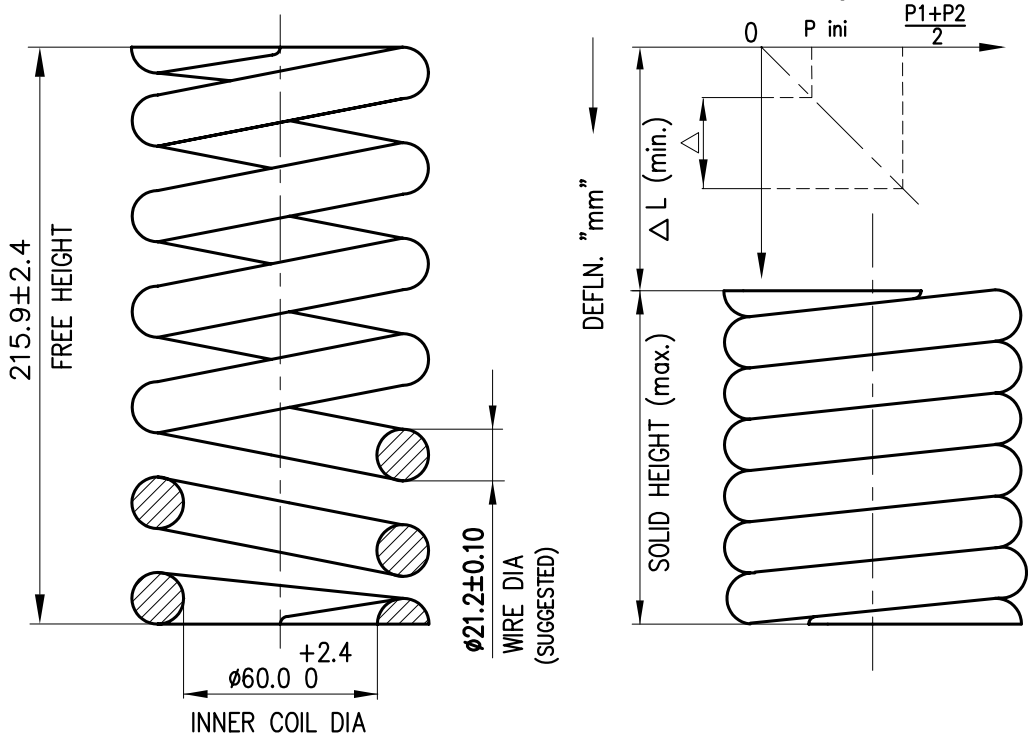

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104170CR	
02	MAX. OUTSIDE DIA		(mm)	114.3
03	SPRING RATE		(Kg/mm)	56.600
04	AVERAGE DEFLECTION △L min.		(mm)	57.1
05	INITIAL LOADING P ini		(Kgs)	485.0
06	TEST DEFLECTION △		(mm)	40.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	2635.1
		P_2 MAX.	(Kgs)	2861.5
08	TILT DEFLECTION		(mm)	48.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.8^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	5.1
11	PITCH	(mm)	29.9±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1837
13	RAW MATERIAL DIA x LENGTH	(mm)	ø30x2460
14	RAW MATERIAL WEIGHT	(Kgs)	13.7
15	RAW MATERIAL CODE	153274100000	
16	SPRING CODE	931721150000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.		REV.					NAME	SIGN	DATE
03	ALTD:	02	ALTD: G.V	26.03.08		DRAWN	G.Venkateshwaralu		26.03.08
	CHKD:		CHKD: E.A	26.03.08		CHECKED	E.Athiannavi		26.03.0
	APPD:		APPD: E.A	26.03.08		APPROVED	E.Athiannavi		26.03.0

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800783 DT.07.01.08

TITLE: SPRING

DRG No. 4-V-J417-21115 REV. 02

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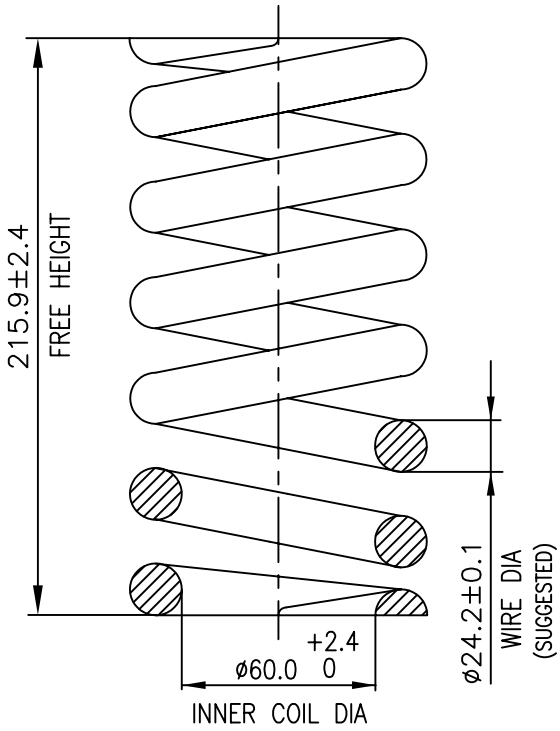

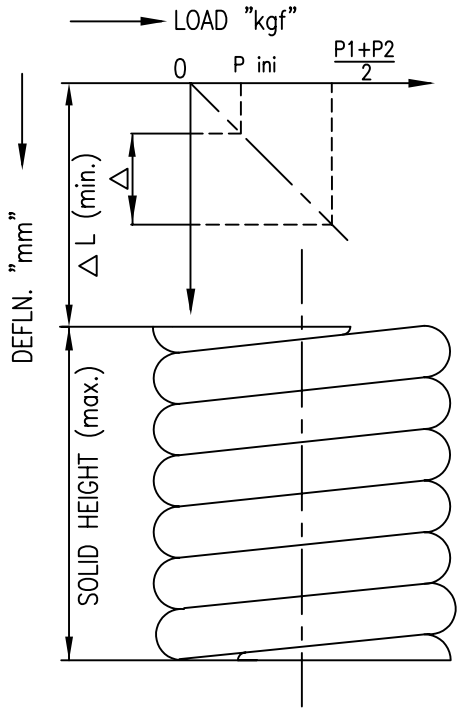

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104220CR	
02	MAX. OUTSIDE DIA		(mm)	114.3
03	SPRING RATE		(Kg/mm)	96.149
04	AVERAGE DEFLECTION △L min.		(mm)	47.0
05	INITIAL LOADING P ini		(Kgs)	678.5
06	TEST DEFLECTION △		(mm)	32.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	3686.2
		P_2 MAX.	(Kgs)	4002.8
08	TILT DEFLECTION		(mm)	40.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.1^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	6.3
11	PITCH	(mm)	32.6±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1736.0
13	RAW MATERIAL DIA x LENGTH	(mm)	30 x 2270
14	RAW MATERIAL WEIGHT	(Kgs)	12.6
15	RAW MATERIAL CODE	153274100000	
16	SPRING CODE	931720950000 964161580000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST : ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
06	CHKD:	05	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	N.T		10.09.11
CHECKED	S.M		10.09.11
APPROVED	E.A		10.09.11

TITLE: SPRING

DRG No. 4-V-J422-21095 REV. 04

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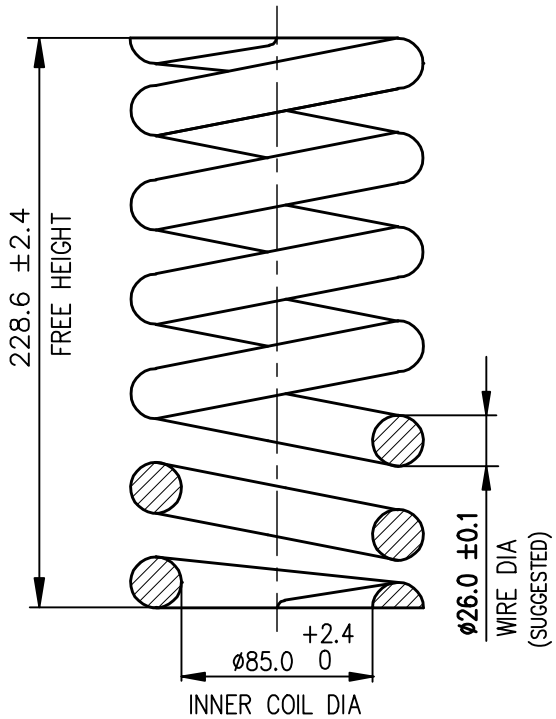

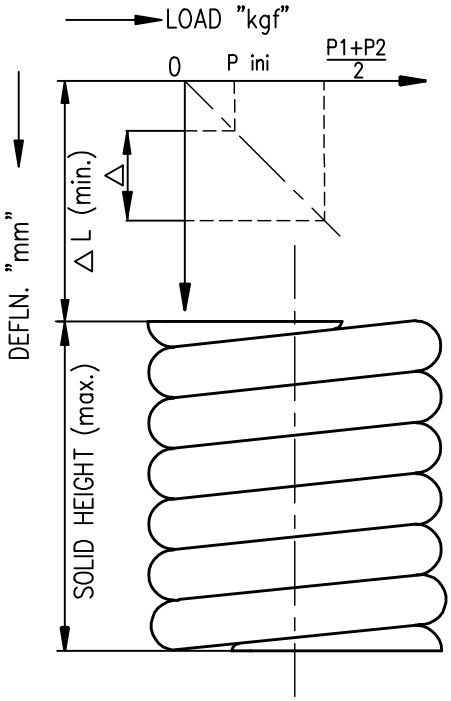

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104300CR	
02	MAX. OUTSIDE DIA		(mm)	150.8
03	SPRING RATE		(Kg/mm)	62.510
04	AVERAGE DEFLECTION △L min.		(mm)	60.8
05	INITIAL LOADING P_{ini}		(Kgs)	570.2
06	TEST DEFLECTION △		(mm)	42.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	3097.9
		P_2 MAX.	(Kgs)	3364.0
08	TILT DEFLECTION		(mm)	51.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.4^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	8.7
11	PITCH	(mm)	38.4 ±1.1
12	DEVELOPED LENGTH OF ROD	(mm)	2081.0
13	RAW MATERIAL DIA x LENGTH	(mm)	ø32x2660
14	RAW MATERIAL WEIGHT	(Kgs)	16.8
15	RAW MATERIAL CODE	153274110000	
16	SPRING CODE	931721950000/ 964159460000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A689/A322 GR.5160/6150, ASTM A401, ASTM A689/A304 GR.5160H/6150H/4161H, BS PT2-735A50/735A51/735H51, BS 2803-735A50/685A55, DIN 17221 GR.51CrMoV4.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.	
02	ALTD: G.V	15.07.09	01	ALTD: M.R.C
	CHKD: S.M	15.07.09		CHKD: K.S.R
	APPD: E.A	15.07.09		APPD: K.S.R

(REF.DRG.NO.4VJ43023195/00)

DRG. UPDATED, REDRAWN IN CAD.
DCP.NO.800903 DT.21.01.09

RETRACED & UPDATED
DCN.NO.SR: 0189 DT.07.07.97

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		15.07.09
CHECKED	S.Madhulingam		15.07.09
APPROVED	E.Athiannavi		15.07.0

TITLE: SPRING

DRG No. 4-V-J430-21195 REV. 02

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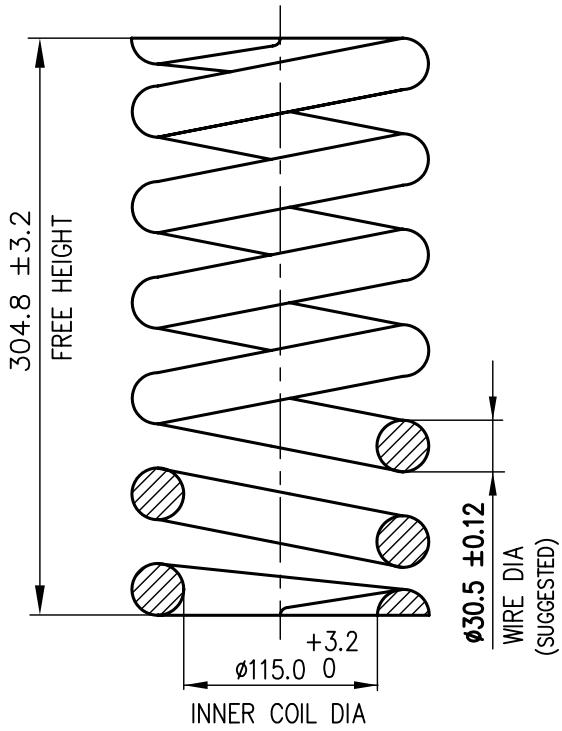

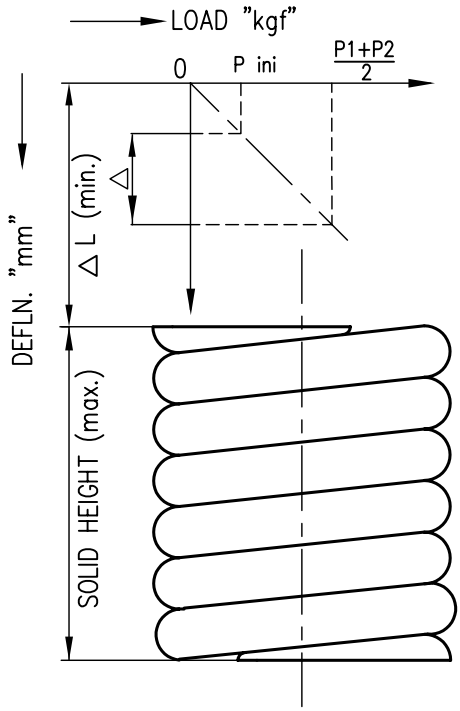

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0104600CR**	
02	MAX. OUTSIDE DIA		(mm)	177.8
03	SPRING RATE		(Kg/mm)	50.172
04	AVERAGE DEFLECTION △L min.		(mm)	101.1
05	INITIAL LOADING P ini		(Kgs)	760.8
06	TEST DEFLECTION △		(mm)	70.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	4133.7
		P_2 MAX.	(Kgs)	4488.8
08	TILT DEFLECTION		(mm)	85.9

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$5.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	16.3
11	PITCH	(mm)	50.1 ±1.4
12	DEVELOPED LENGTH OF ROD	(mm)	2836
13	RAW MATERIAL DIA x LENGTH	(mm)	ø40x3470
14	RAW MATERIAL WEIGHT	(Kgs)	34.2
15	RAW MATERIAL CODE	153274130000	
16	SPRING CODE	**931723190000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV. 02	ALTD:	REV. 01	ALTD: G.V 22.01.09		
	CHKD:		CHKD: E.A 22.01.09		
	APPD:		APPD: E.A 22.01.09		
		DRG. UPDATED REDRAWN IN CAD. DCP.NO.800903 DT.21.01.09			

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		22.01.09
CHECKED	E.Athiannavi		22.01.09
APPROVED	E.Athiannavi		22.01.0

TITLE: SPRING

DRG No. 4-V-J460-21319 REV. 01

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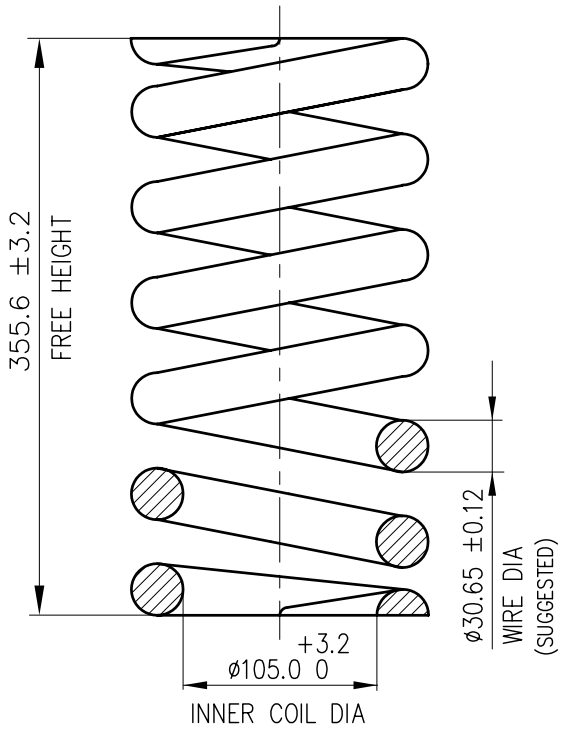
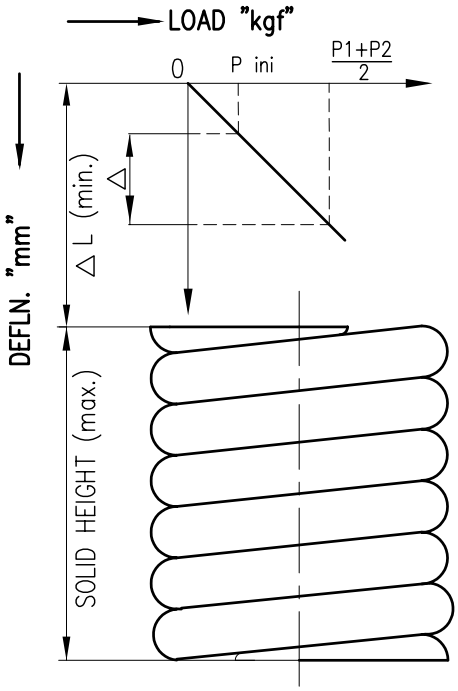
ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0106180CR	
02	MAX. OUTSIDE DIA		(mm)	181.0
03	SPRING RATE		(Kg/mm)	51.583
04	AVERAGE DEFLECTION △L min.		(mm)	115.5
05	INITIAL LOADING P ini		(Kgs)	893.4
06	TEST DEFLECTION △		(mm)	80.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	4854.3
		P_2 MAX.	(Kgs)	5271.3

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	98.1
09	EFFECTIVE NO. OF COILS	NOS	$7.0\ ^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	18.2
11	PITCH	(mm)	49.0 ±1.3
12	DEVELOPED LENGTH OF ROD	(mm)	3142
13	RAW MATERIAL DIA x LENGTH	(mm)	ø36x3760
14	RAW MATERIAL WEIGHT	(Kgs)	37.1
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 OR ASTM A304 GR.5160H/6150H.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.	
02	ALTD:	01	ALTD: G.V 20.04.10
	CHKD:		CHKD: S.M 20.04.10
	APPD:		APPD: E.A 20.04.10

NOTES UPDATED
DCN.No.801027

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		18.03.06
CHECKED	E.ATHIANNAVI		18.03.06
APPROVED	E.ATHIANNAVI		18.03.0

TITLE: SPRING

DRG No. 4-V-J618-23442 REV. 01

COMP. CODE: 931724420900/964160350900

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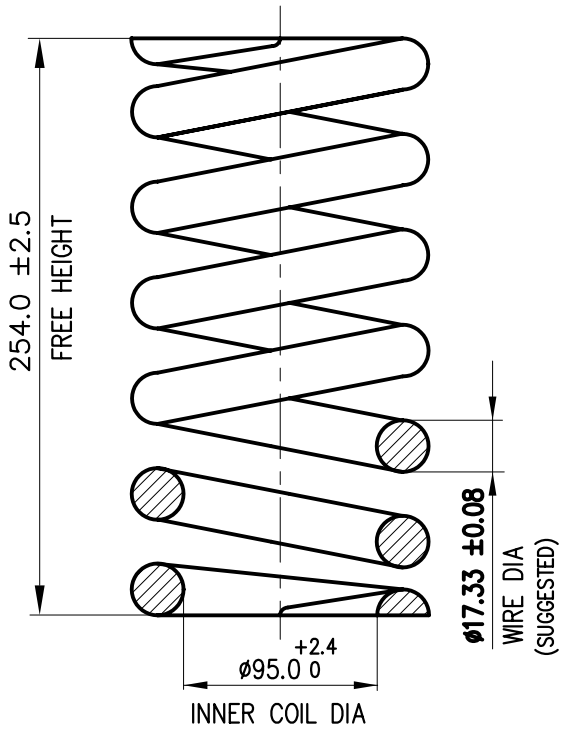

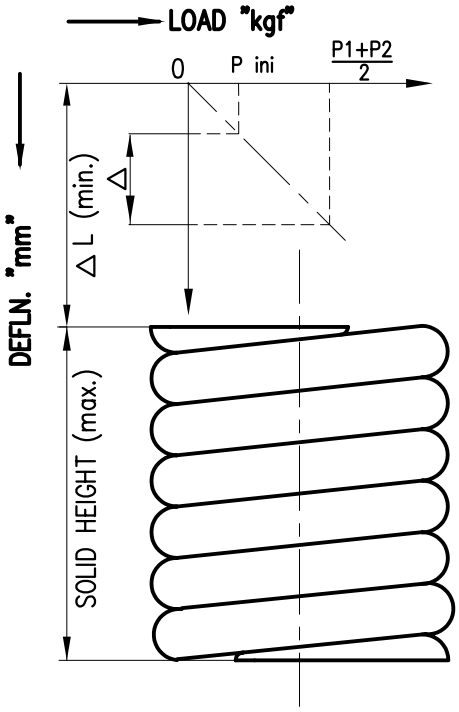

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0106360CR**	
02	MAX. OUTSIDE DIA		mm	139.7
03	SPRING RATE		Kg/mm	10.642
04	AVERAGE DEFLECTION Δ L min.		mm	132.1
05	INITIAL LOADING P ini		Kg	210.8
06	TEST DEFLECTION Δ		mm	92.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	1145.5
		P_2 MAX.	Kg	1243.9
08	TILT DEFLECTION		mm	112.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.1^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	4.3
11	PITCH	mm	41.3 ±1.0
12	DEVELOPED LENGTH OF ROD	mm	2316
13	RAW MATERIAL DIA x LENGTH	mm	ø25x2892
14	RAW MATERIAL WEIGHT	Kg	11.1
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931722260000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	26.10.07	
	CHKD: E.A	26.10.07	
	APPD: E.A	26.10.07	

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.07

REV.			
01	ALTD:	MRC	07.07.97
	CHKD:	KSR	07.07.97
	APPD:	V.M	07.07.97

RETRACED AND UPDATED
DCN NO. SR:0189

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		26.10.07
CHECKED	E.ATHIANNAVI		26.10.07
APPROVED	E.ATHIANNAVI		26.10.(

TITLE: SPRING

DRG No. 4-V-J636-21226 REV. 02

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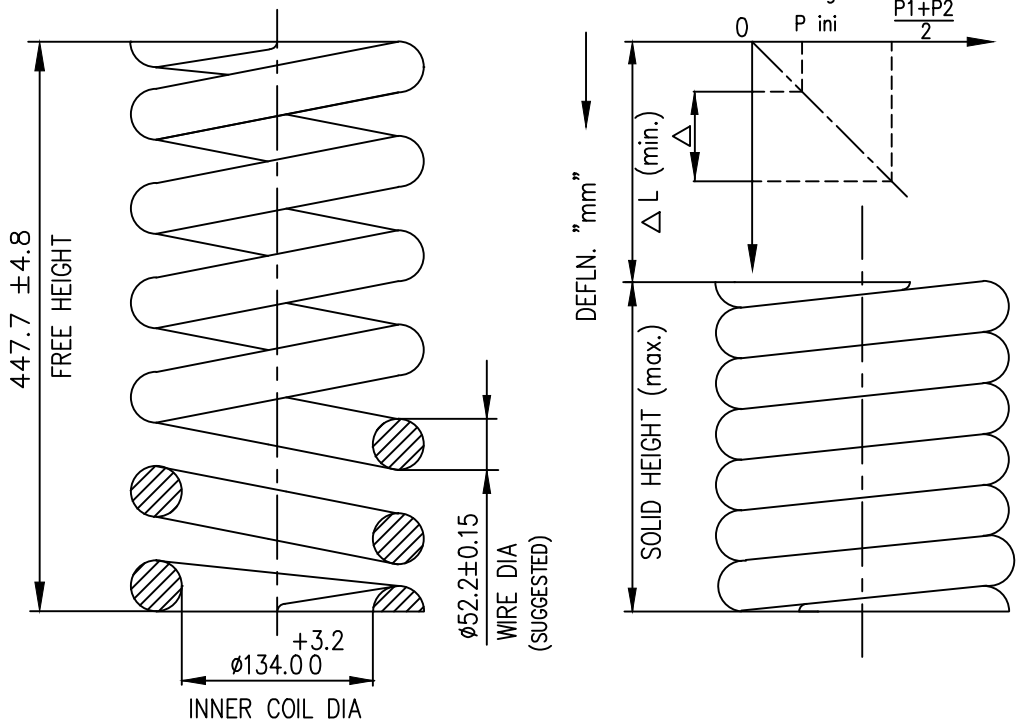

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0107260CR	
02	MAX. OUTSIDE DIA		(mm)	238.4
03	SPRING RATE		(Kg/mm)	196.404
04	AVERAGE DEFLECTION △L min.		(mm)	83.9
05	INITIAL LOADING P ini		(Kgs)	2473.2
06	TEST DEFLECTION △		(mm)	58.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	13437.3
		P_2 MAX.	(Kgs)	14591.5

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	71.3
09	EFFECTIVE NO. OF COILS	NOS	$5.9\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	63.3
11	PITCH	(mm)	68.4±2.0
12	DEVELOPED LENGTH OF ROD	(mm)	3772.0
13	RAW MATERIAL DIA x LENGTH	(mm)	56X4950
14	RAW MATERIAL WEIGHT	(Kgs)	95.7
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
04	ALTD: R.P.J	10.12.12	03	ALTD: G.V	29.04.10
	CHKD: S.M	10.12.12		CHKD: S.M	29.04.10
	APPD: E.A	10.12.12		APPD: E.A	29.04.10
	NOTES UPDATED DCP.No.801269			NOTES UPDATED DCP.No.801027	

	NAME	SIGN	DATE
DRAWN	LRS		04.01.2002
CHECKED	VPP		04.01.2002
APPROVED	KN		04.01.200

TITLE: SPRING

DRG No. 4-V-J726-23120 REV. 04

COMP. CODE: 931721200900/964159510900

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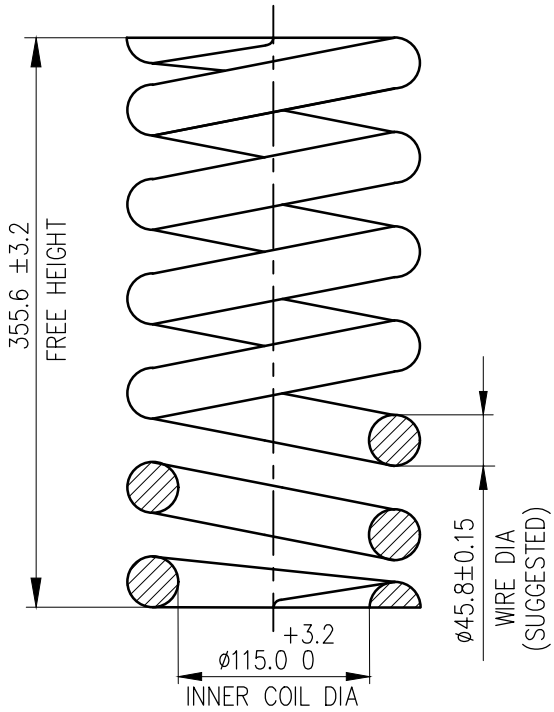

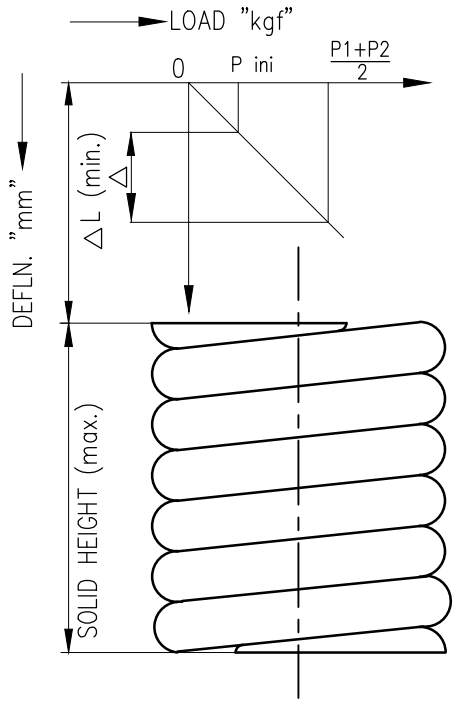

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0107290CR	
02	OUTSIDE DIA. MAX. LIMIT		(mm)	222.3
03	SPRING RATE (±4%)		(Kg/mm)	205.331
04	SOLID DEFLECTION △L min.		(mm)	68.3
05	INITIAL LOADING P ini		(Kgs)	2103.6
06	TEST DEFLECTION △		(mm)	47.8
07	LOAD AT TEST DEFLECTION	P1 MIN.	(Kgs)	11431.8
		P2 MAX.	(Kgs)	12409.2

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	58.1
09	EFFECTIVE NO.OF COILS	NOS	$5.2\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	41.0
11	PITCH	(mm)	60.3 ±1.4
12	DEVELOPED LENGTH OF ROD	(mm)	3183
13	RAW MATERIAL LENGTH	(mm)	4580
14	RAW MATERIAL WEIGHT	(Kgs)	–
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 13 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. **ACCEPTABLE SPRING MATERIALS TO ATTEST:**
   ASTM A322–6150/5160, A304–5160H/6150H/4161H, A401
   BS970 Pt2–735A51/735H51, BS2803–735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270–2/IS4454–2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.	ALTD:	REV.	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

भेल BHEL
365–081/A
08.09.2020

	NAME	SIGN	DATE
DRAWN	J.DHANABAL		24.12.2021
CHECKED	R.RABIN		24.12.2021
APPROVED	S.MADHULINGAM		24.12.202

TITLE: SPRING

DRG No. 4–V–J729–23908 REV. 00

COMP. CODE: 931728780900

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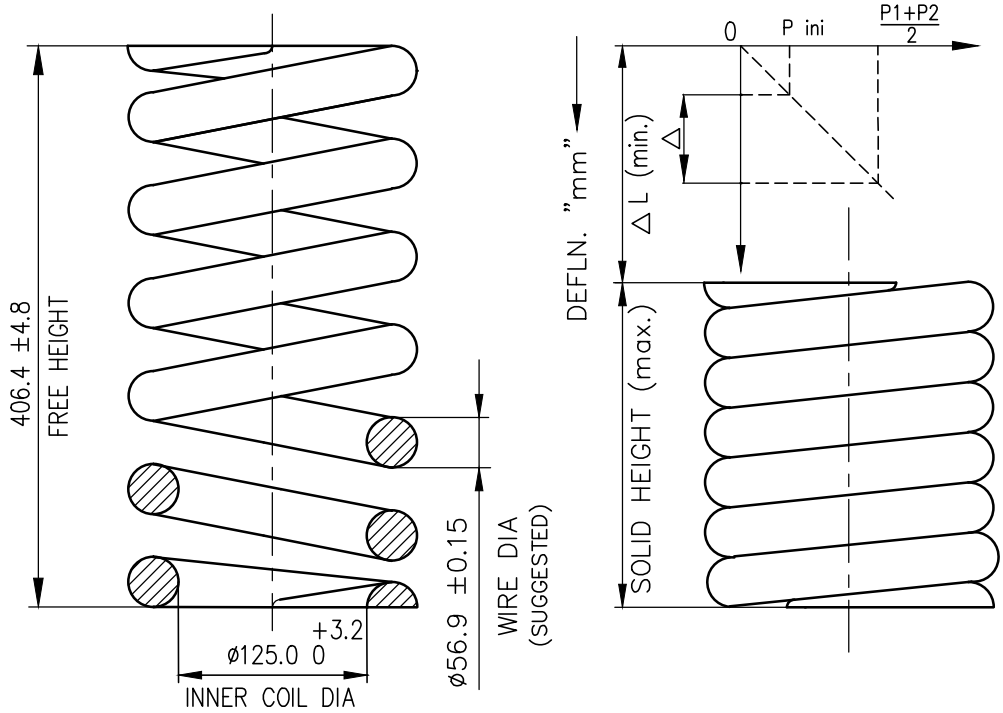

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0107470CR	
02	OUTSIDE DIA MAX.LIMITS		(mm)	254.0
03	SPRING RATE (±4%)		(Kg/mm)	355.695
04	AVERAGE DEFLECTION △L min.		(mm)	63.5
05	INITIAL LOADING P_{ini}		(Kgs)	3388.0
06	TEST DEFLECTION △		(mm)	44.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	18411.5
		P_2 MAX.	(Kgs)	19985.8

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	54.0
09	EFFECTIVE NO.OF COILS	NOS	$4.9\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	68.83
11	PITCH	(mm)	71.1±2.2
12	DEVELOPED LENGTH OF ROD	(mm)	3466.0
13	RAW MATERIAL DIA x LENGTH	(mm)	60 x 4890
14	RAW MATERIAL WEIGHT	(Kgs)	108.535
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS AND DESIGNED FOR SAFETY VALVE APPLICATIONS ONLY.
2. FREE HEIGHT,SPRING RATE & SOLID DEFLECTION SHOULD BE MAINTAINED AND OTHER PARAMETERS TO BE DECIDED BY SPRING VENDOR,ACCORDING TO THE MATERIAL MENTIONED IN THIS DRAWING.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST:
   ASTM A322-6150/5160, A304-5160H/6150H/4161H, A401
   BS970 Pt2-735A51/735H51, BS2803-735A50/685A55
   51CrMoV4/50CrV4/51CrV4/52CrMoV4, EN10270-2/IS4454-2
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.		REV.		
02	ALTD:	01	ALTD: R.P.J	26.05.13
	CHKD:		CHKD: S.M	26.05.13
	APPD:		APPD: E.A	26.05.13

NOTES UPDATED
DCP.No.801440

	NAME	SIGN	DATE
DRAWN	RPJ		25.04.2011
CHECKED	VPP		25.04.2011
APPROVED	EA		25.04.2

TITLE: SPRING

DRG No. 4-V-J747-23802 REV. 01

COMP. CODE: 931728020900/964161300900/974628410900

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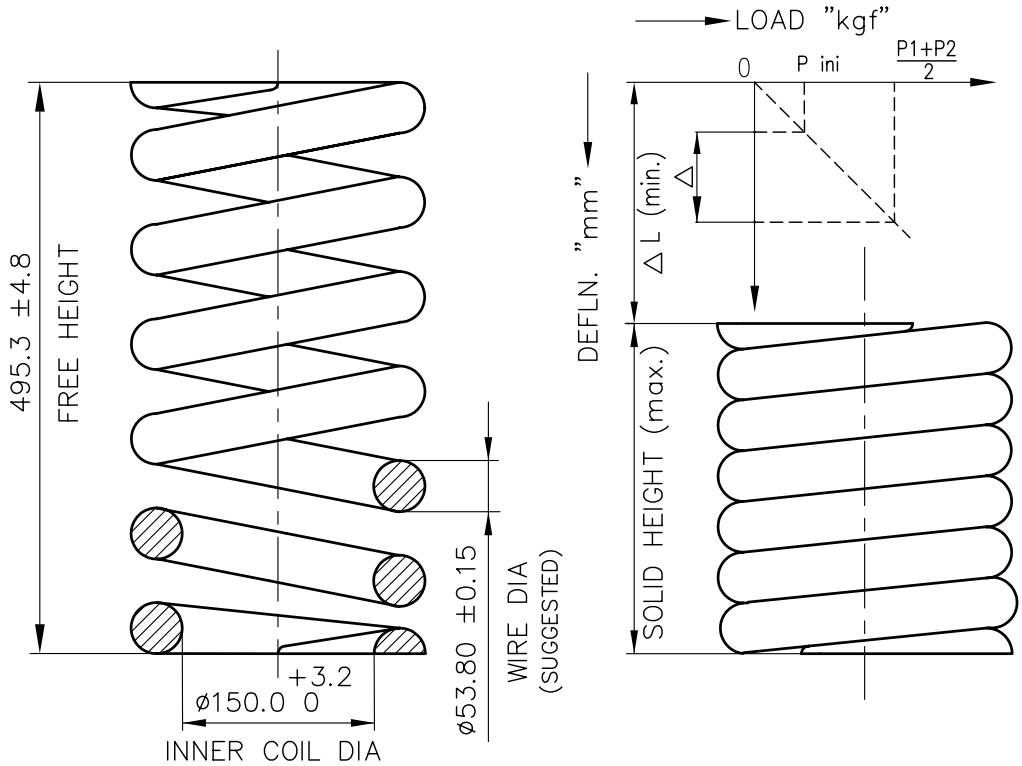

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0107790CR	
02	OUTSIDE DIA.MAX.LIMIT		(mm)	266.7
03	SPRING RATE		(Kg/mm)	159.980
04	AVERAGE DEFLECTION ΔL min.		(mm)	106.7
05	INITIAL LOADING P_{ini}		(Kgs)	2560.0
06	TEST DEFLECTION Δ		(mm)	74.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	13909.3
		P_2 MAX.	(Kgs)	15104.0

ROW	DESCRIPTION	UNITS	VALUE
08	TILT DEFLECTION	(mm)	90.7
09	EFFECTIVE NO.OF COILS	NOS	$6.3\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	77.1
11	PITCH	(mm)	72.6±2.0
12	DEVELOPED LENGTH OF ROD	(mm)	4323.0
13	RAW MATERIAL DIA x LENGTH	(mm)	60 x 5600
14	RAW MATERIAL WEIGHT	(Kgs)	124.2
15	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.5160/6150 or ASTM A304 GR.5160H/6150H
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH THE INSPECTING AUTHORITY APPROVED UNDER IBR 1950.

REV.			REV.		
02	ALTD: RPJ	29.04.2011	01	ALTD: ASJ	13.02.2010
	CHKD: VPP	29.04.2011		CHKD: ASJ	13.02.2010
	APPD: E.A	29.04.2011		APPD: E.A	13.02.2010
	NOTES UPDATED DCP.No.801130			96 CODE ADDED & NOTES ALTERED DCP.No.801011	

	NAME	SIGN	DATE
DRAWN	LRS		04.01.2002
CHECKED	VPP		04.01.2002
APPROVED	KN		04.01.

TITLE SPRING

DRG No. 4-V-J779-23123 REV. 02

COMP. CODE: 931721230900/964160190900

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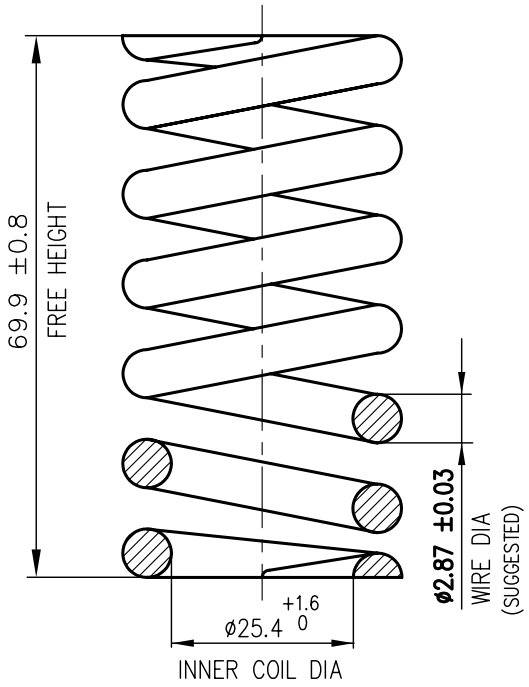

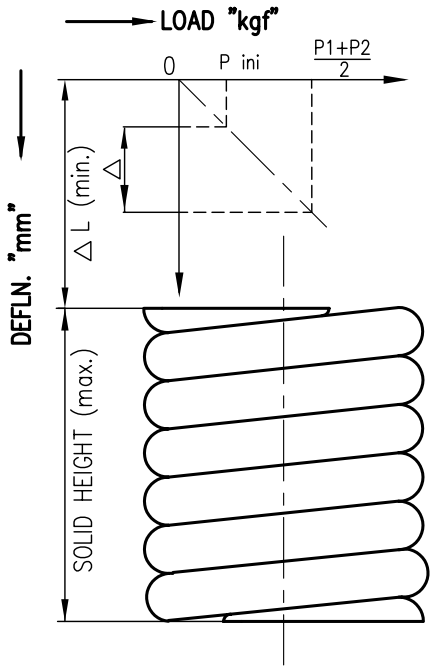

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0100120**	
02	MAX. OUTSIDE DIA		mm	38.1
03	SPRING RATE		Kg/mm	0.464
04	AVERAGE DEFLECTION △L min.		mm	46.1
05	INITIAL LOADING P ini		Kg	3.2
06	TEST DEFLECTION △		mm	32.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	17.4
		P_2 MAX.	Kg	18.9
08	TILT DEFLECTION		mm	39.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.5 ±0.25
10	SPRING WEIGHT	Kg	0.04
11	PITCH	mm	9.8 ±0.3
12	DEVELOPED LENGTH OF ROD	mm	674
13	RAW MATERIAL DIA x LENGTH	mm	--
14	RAW MATERIAL WEIGHT	Kg	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**964151140000**	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A227 CL.I&II/IS4454 GR.2/A228, REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	18.05.07
	CHKD:		CHKD: E.A	18.05.07
	APPD:		APPD: E.A	18.05.07

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.07

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		18.05.07
CHECKED	E.ATHIANNAVI		18.05.07
APPROVED	E.ATHIANNAVI		18.05.07

TITLE: SPRING

DRG No. 4-V-J012-21465 REV. 01

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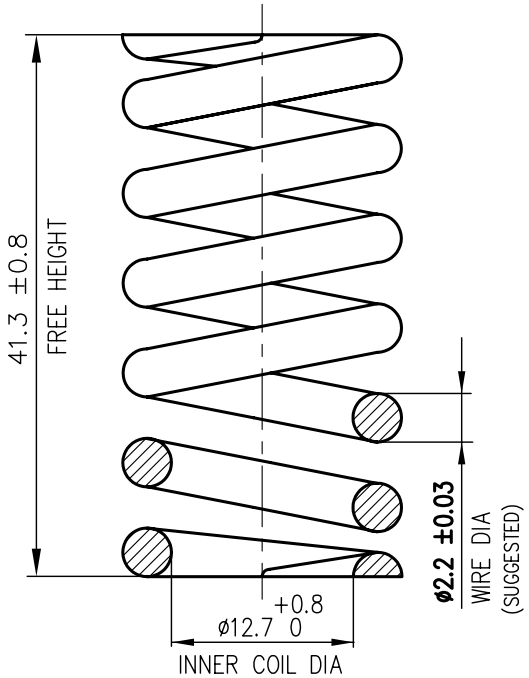

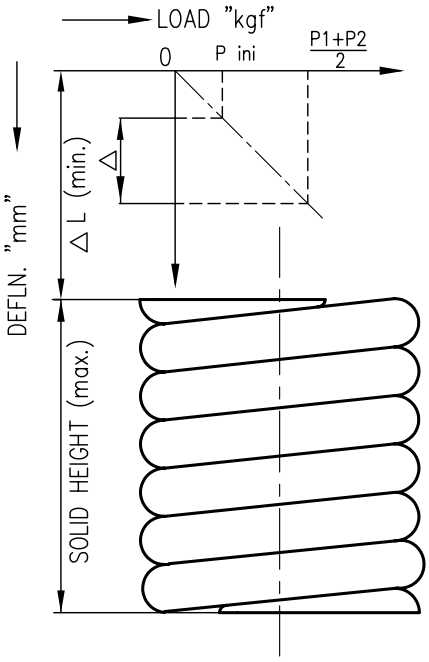

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**1000140SY**	
02	MAX. OUTSIDE DIA		(mm)	23.8
03	SPRING RATE		(Kg/mm)	0.498
04	AVERAGE DEFLECTION △L min.		(mm)	11.3
05	INITIAL LOADING P_{ini}		(Kgs)	0.9
06	TEST DEFLECTION △		(mm)	7.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	4.6
		P_2 MAX.	(Kgs)	5.0
08	TILT DEFLECTION		(mm)	9.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	12.5 ±0.25
10	SPRING WEIGHT	(Kgs)	0.02
11	PITCH	(mm)	3.0 ±0.2
12	DEVELOPED LENGTH OF ROD	(mm)	633
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974621680000/ 964156660000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A313 TYPE-316/A276 TYPE-316.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	06.07.07	
	CHKD: E.A	06.07.07	
	APPD: E.A	06.07.07	

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.2007

REV.			
01	ALTD:	MRC	24.04.97
	CHKD:	KSR	24.04.97
	APPD:	KSR	24.04.97

RETRACED & UPDATED.
DCN: SR: 0188

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		06.07.07
CHECKED	E.Athiannavi		06.07.07
APPROVED	E.Athiannavi		06.07.07

TITLE: SPRING

DRG No. 4-V-J014-21356 REV. 02

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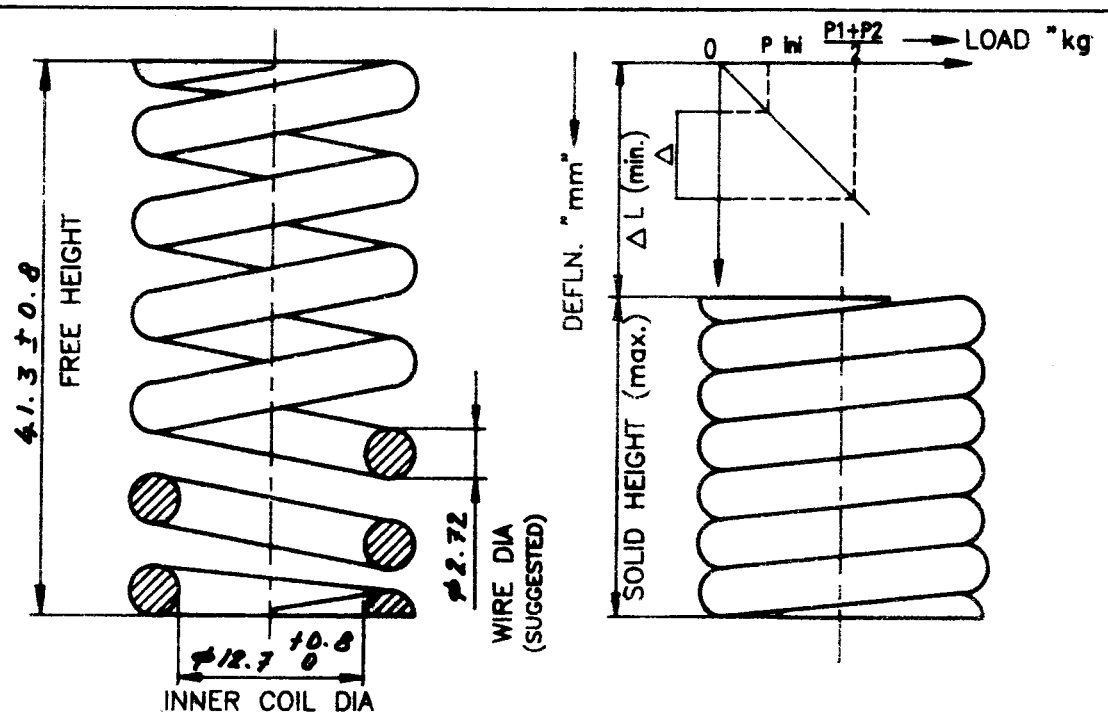


ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000160 CR	
02	MAX. OUTSIDE DIA		(mm)	23.8
03	SPRING RATE		(Kg/mm)	1.561
04	AVERAGE DEFLECTION ΔL min.		(mm)	11.0
05	INITIAL LOADING P_{ini}		(Kgs)	2.6
06	TEST DEFLECTION Δ		(mm)	7.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	14.0
		P_2 MAX.	(Kgs)	15.2
08	TILT DEFLECTION		(mm)	9.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	8.8 ± 0.25
10	SPRING WEIGHT	(Kgs)	0.02
11	PITCH	(mm)	4.1 ± 0.3
12	DEVELOPED LENGTH OF ROD	(mm)	478
13	RAW MATERIAL DIA. x LENGTH	(mm)	φ2.72 x 930
14	RAW MATERIAL WEIGHT	(Kgs)	0.04
15	RAW MATERIAL CODE		—
16	SPRING CODE		974624900000
17	PROCESS OF MANUFACTURE		HOT/[redacted] COILING

NOTES:-

1. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE, IF IMPORTED.
2. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON-IBR APPLICATIONS.
3. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
4. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A322-6150/BS:2803.735A50

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD: 24.4.97

RETRACED & UPDATED.

DCN: SR: 0188

	NAME	SIGN	DATE
DRAWN	MRC / [redacted]		24.4.97
CHECKED	KSR / [redacted]		24.4.97
APPROVED	KSR [redacted]		24.4.97

TITLE: SPRING

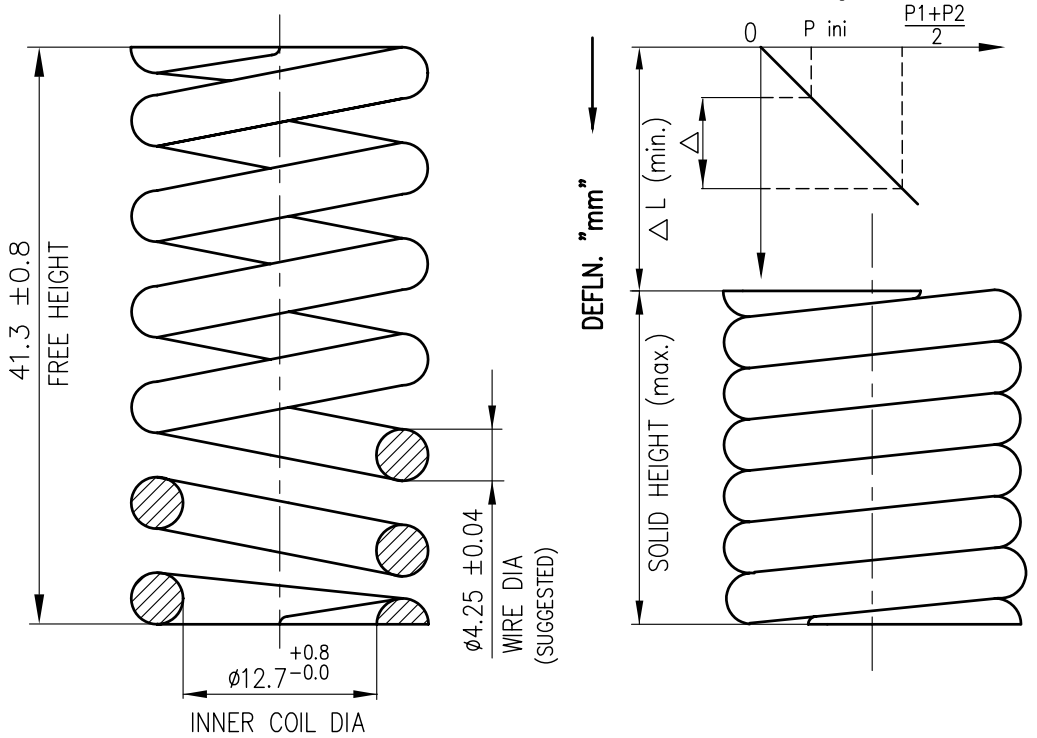
DRG No. [redacted]-V-J016-21360

REVISION 01

CORPORATE DRG ID
TP-DG-4-V-J016-21360

CORPORATE DRG ID
TP-DG-4-V-J016-21360

ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		1000230	
02	MAX. OUTSIDE DIA		(mm)	23.8
03	SPRING RATE		(Kg/mm)	12.195
04	AVERAGE DEFLECTION △L min.		(mm)	10.0
05	INITIAL LOADING P ini		(Kgs)	18.3
06	TEST DEFLECTION △		(mm)	7.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	99.5
		P_2 MAX.	(Kgs)	108.0
08	TILT DEFLECTION		(mm)	8.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	5.6 ±0.25
10	SPRING WEIGHT	(Kgs)	0.039
11	PITCH	(mm)	5.9 ±0.3
12	DEVELOPED LENGTH OF ROD	(mm)	351.0
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	964155970000	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NO

1. ACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR APPLICATION.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A227 CL.I&II/IS:4454 GR.2/A228
   REFER ASTM STD. FOR TENSILE STRENGTH & HARDNESS.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.Venkateswaralu		17.01.06
CHECKED	E.Athiannavi		17.01.06
APPROVED	E.Athiannavi		17.01.06

TITLE SPRING

DRG No. 4–V–J023–21752 REV. 00

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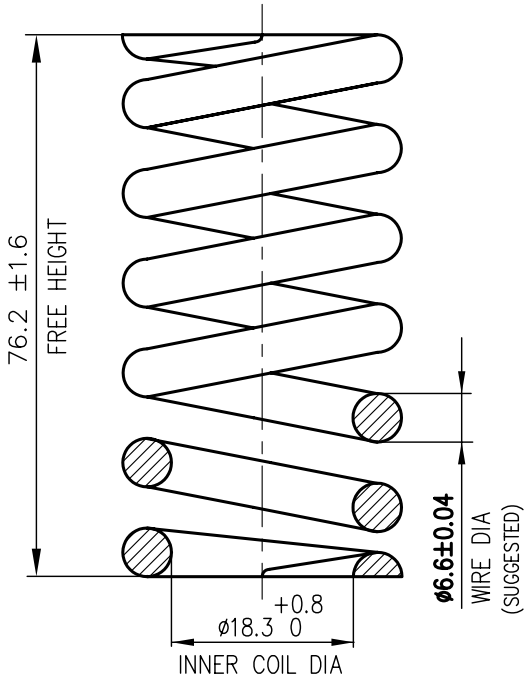
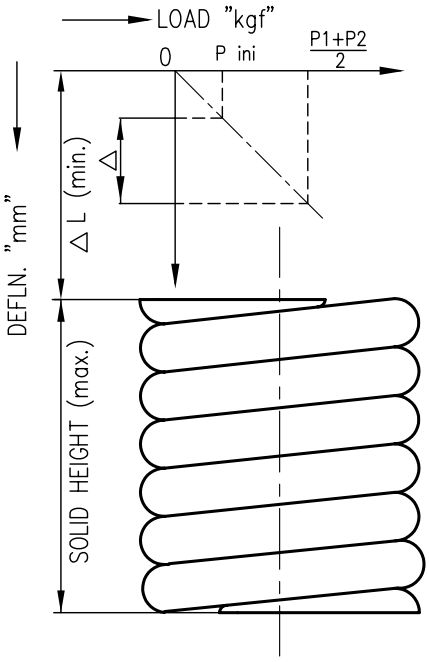
CORPORATE DRG ID
TP-DG-4-V-J023-21752

CORPORATE DRG ID
TP-DG-4-V-J023-21752

ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**1100270IX**	
02	MAX. OUTSIDE DIA		(mm)	34.9
03	SPRING RATE		(Kg/mm)	17.895
04	AVERAGE DEFLECTION △L min.		(mm)	16.0
05	INITIAL LOADING P_{ini}		(Kgs)	42.8
06	TEST DEFLECTION △		(mm)	11.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	232.6
		P_2 MAX.	(Kgs)	252.6
08	TILT DEFLECTION		(mm)	13.6

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	7.0 ±0.25
10	SPRING WEIGHT	(Kgs)	0.18
11	PITCH	(mm)	9.0 ±0.6
12	DEVELOPED LENGTH OF ROD	(mm)	630
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974622380000/ 964156290000**	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A637 GR.688 TYPE 1–INCONEL X750/ ASTM B637–UNS NO.7750.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	15.05.07	
	CHKD: E.A	15.05.07	
	APPD: E.A	15.05.07	

DRG. UPDATED & REDRAWN IN CAD. DCP.NO.800666 DT.27.03.2007

REV.			
02	ALTD:	MRC	24.04.97
	CHKD:	KSR	24.04.97
	APPD:	KSR	24.04.97

RETRACED AND UPDATED DCN NO. SR:0188

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.05.07
CHECKED	E.Athiannavi		15.05.07
APPROVED	E.Athiannavi		15.05.07

TITLE: SPRING

DRG No. 4–V–J027–21005 REV. 03

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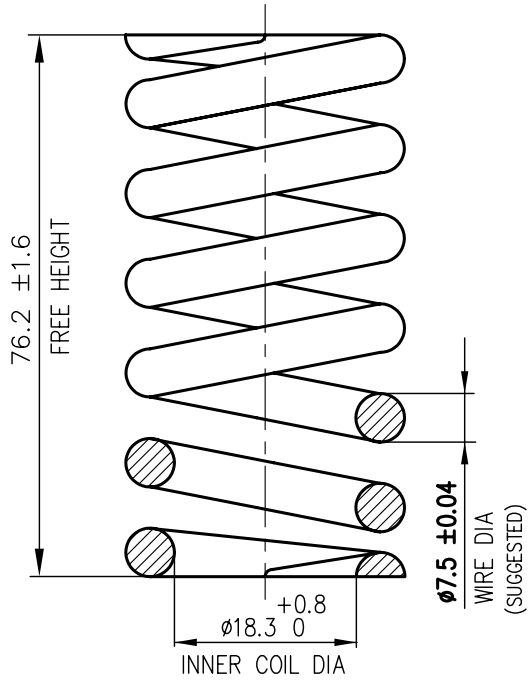

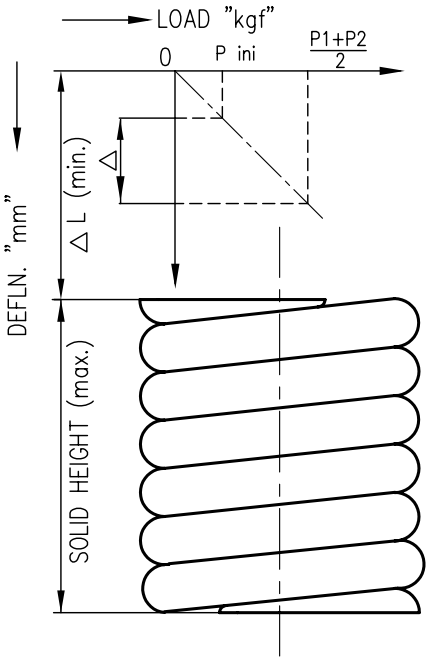

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**1100280IX**	
02	MAX. OUTSIDE DIA		(mm)	34.9
03	SPRING RATE		(Kg/mm)	29.925
04	AVERAGE DEFLECTION △L min.		(mm)	14.6
05	INITIAL LOADING P_{ini}		(Kgs)	59.2
06	TEST DEFLECTION △		(mm)	10.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	355.3
		P_2 MAX.	(Kgs)	392.8
08	TILT DEFLECTION		(mm)	12.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	6.2 ±0.25
10	SPRING WEIGHT	(Kgs)	0.2
11	PITCH	(mm)	9.8 ±0.6
12	DEVELOPED LENGTH OF ROD	(mm)	590
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974622390000/ 964156110000**	
17	PROCESS OF MANUFACTURE	~~HOT~~/COLD COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A637 GR.688 TYPE 1–INCONEL X750/ ASTM B637–UNS NO.7750.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	08.06.07	
	CHKD: E.A	08.06.07	
	APPD: E.A	08.06.07	

96 CODE & NOTE–4 ADDED.
DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800686 DT.08.06.2007

REV.			
02	ALTD:	MRC	15.02.00
	CHKD:	KSR	15.02.00
	APPD:	KSR	15.02.00

MATL.SPECN: ASTM B637 WAS A937 GR.688 TYPE–1
DCN: SR: 0243

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		08.06.07
CHECKED	E.Athiannavi		08.06.07
APPROVED	E.Athiannavi		08.06.07

TITLE: SPRING

DRG No. 4–V–J028–21046 REV. 03

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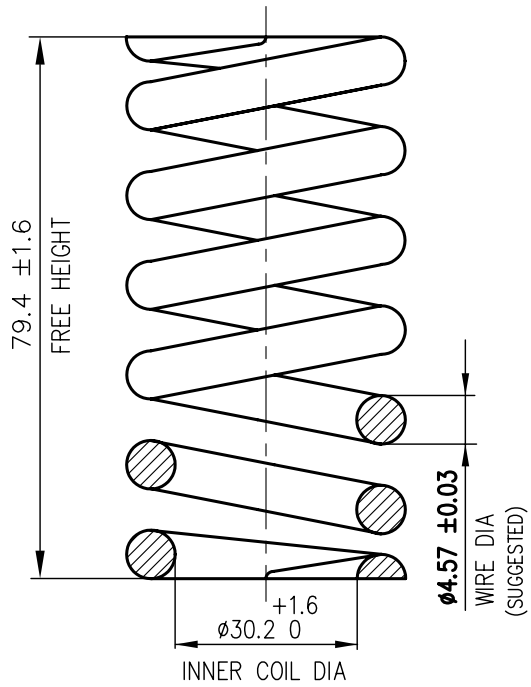

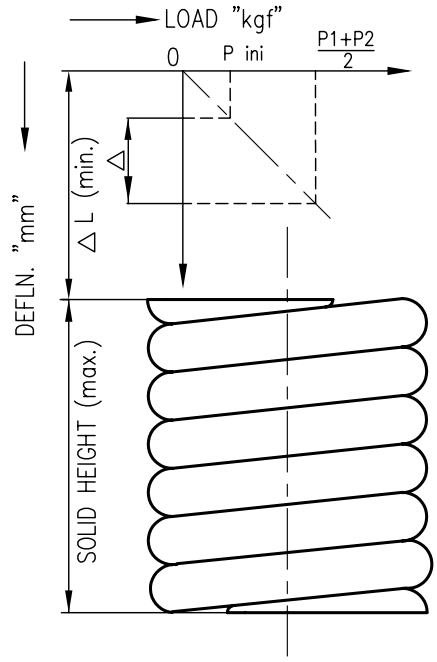

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0301050CR**	
02	MAX. OUTSIDE DIA		(mm)	50.8
03	SPRING RATE		(Kg/mm)	1.518
04	AVERAGE DEFLECTION △L min.		(mm)	41.1
05	INITIAL LOADING P_{ini}		(Kgs)	9.4
06	TEST DEFLECTION △		(mm)	28.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	50.9
		P_2 MAX.	(Kgs)	55.3
08	TILT DEFLECTION		(mm)	35.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.0^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.103
11	PITCH	(mm)	11.1 ±0.6
12	DEVELOPED LENGTH OF ROD	(mm)	803
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974626800000/ 964156630000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	22.06.07
	CHKD:		CHKD: E.A	22.06.07
	APPD:		APPD: E.A	22.06.07

DRG. UPDATED & REDRAWN IN CAD.
DCP. NO. 800666 DT.27.03.07

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		22.06.07
CHECKED	E.Athiannavi		22.06.07
APPROVED	E.Athiannavi		22.06.07

TITLE: SPRING

DRG No. 4-V-J105-21626 REV. 01

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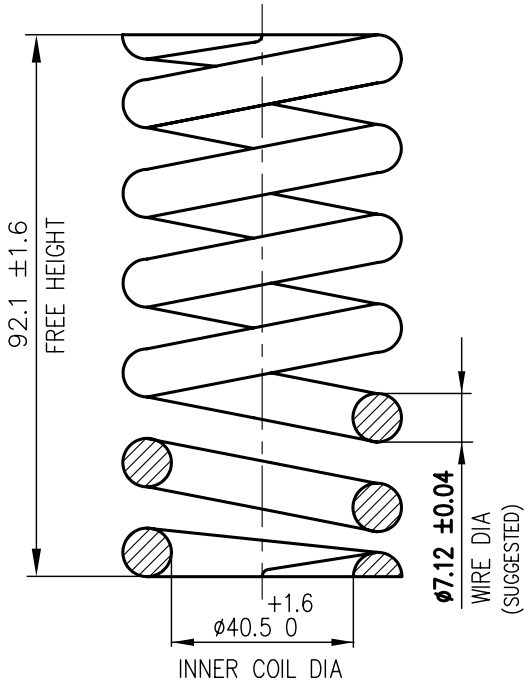

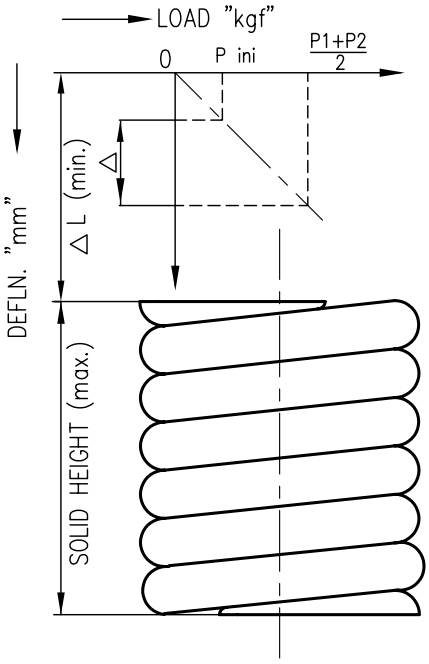

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0102060CR**	
02	MAX. OUTSIDE DIA		(mm)	69.9
03	SPRING RATE		(Kg/mm)	5.089
04	AVERAGE DEFLECTION △L min.		(mm)	48.1
05	INITIAL LOADING P_{ini}		(Kgs)	36.7
06	TEST DEFLECTION △		(mm)	33.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	199.3
		P_2 MAX.	(Kgs)	216.4
08	TILT DEFLECTION		(mm)	40.8

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$4.7^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	0.25
11	PITCH	(mm)	18.1 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	800
13	RAW MATERIAL DIA x LENGTH	(mm)	--
14	RAW MATERIAL WEIGHT	(Kgs)	--
15	RAW MATERIAL CODE	--	
16	SPRING CODE	**974626000000/ 964156620000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
03	ALTD: G.V	18.06.07		02	ALTD:	MRC	16.09.97
	CHKD: E.A	18.06.07			CHKD:	KSR	16.09.97
	APPD: E.A	18.06.07			APPD:	KSR	16.09.97

DRG. UPDATED & REDRAWN IN CAD.
DCP. NO. 800666 DT.27.03.07

MATERIAL BS: 2803-735A50
WAS ASTM A231/A 322 GR.6150
DCN SR: 0193

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		18.06.07
CHECKED	E.ATHIANNAVI		18.06.07
APPROVED	E.ATHIANNAVI		18.06.07

TITLE: SPRING

DRG No. 4-V-J206-21457 REV. 03

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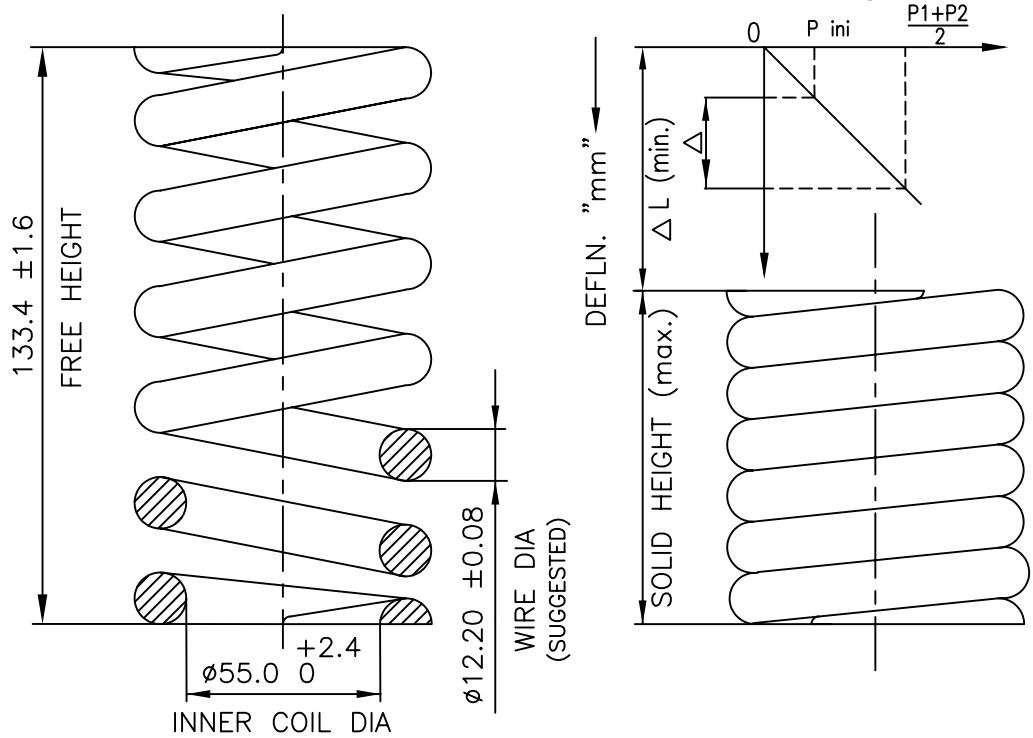

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102590CR	
02	MAX. OUTSIDE DIA		(mm)	85.7
03	SPRING RATE		(Kg/mm)	12.945
04	AVERAGE DEFLECTION Δ L min.		(mm)	50.8
05	INITIAL LOADING P_{ini}		(Kgs)	98.6
06	TEST DEFLECTION Δ		(mm)	35.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	536.0
		P_2 MAX.	(Kgs)	582.0
08	TILT DEFLECTION		(mm)	43.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	$5.7^{0}_{-1/2}$
10	SPRING WEIGHT	(Kgs)	1.2
11	PITCH	(mm)	22.1±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	1317
13	RAW MATERIAL DIA x LENGTH	(mm)	18X1820
14	RAW MATERIAL WEIGHT	(Kgs)	8.0
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931720880900	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.6150/EN48A.

REV.				
02	ALTD:	REV.01	ALTD:	LRS
	CHKD:	21.01.03	CHKD:	VPP
	APPD:		APPD:	KN

RAW MATERIAL CODE.
153274050100
WAS 15927211
DCP NO: 800159

	NAME	SIGN	DATE
DRAWN	LRS		04.04.2002
CHECKED	VPP		04.04.2002
APPROVED	KN		04.04.2002

TITLE: SPRING

DRG No. 4-V-J259-23088 REV. 01

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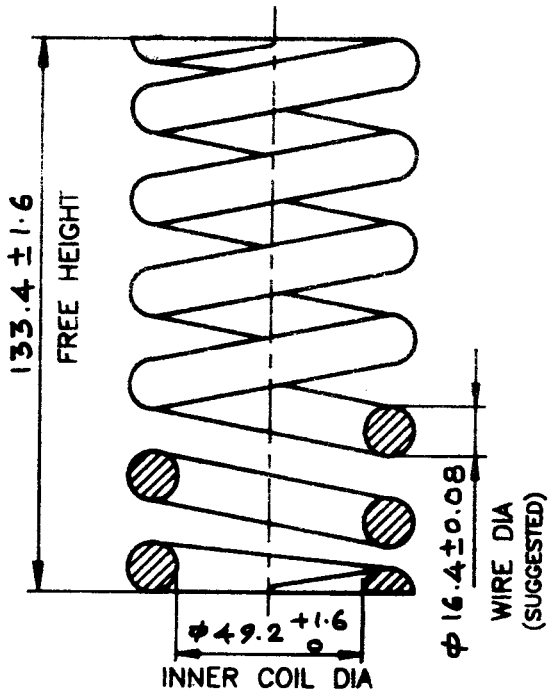
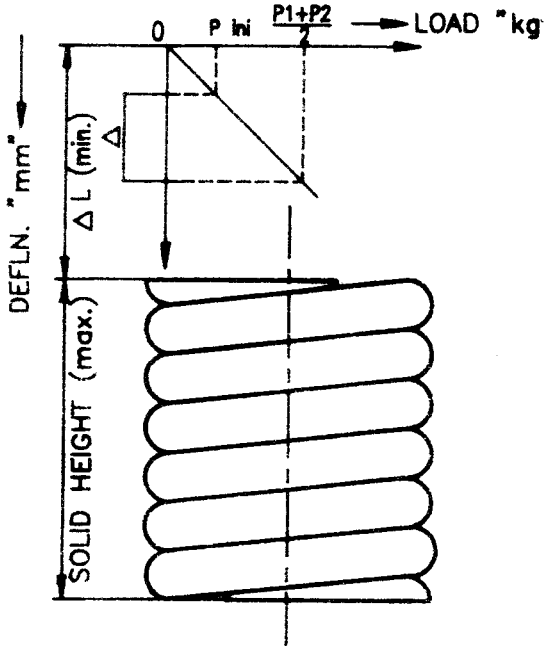
CORPORATE DRG ID
TP-DG-4-V-J259-23088

CORPORATE DRG ID
TP-DG-4-V-J259-23088

ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0102700SY	
02	MAX. OUTSIDE DIA		(mm)	88.9
03	SPRING RATE		(Kg/mm)	47.851
04	AVERAGE DEFLECTION ΔL min.		(mm)	32.8
05	INITIAL LOADING P_{ini}		(Kgs)	235.2
06	TEST DEFLECTION Δ		(mm)	17.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1004.6
		P_2 MAX.	(Kgs)	1110.4
08	TILT DEFLECTION		(mm)	22.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	4.6 ±0.25
10	SPRING WEIGHT	(Kgs)	2.0
11	PITCH	(mm)	23.6 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	1165
13	RAW MATERIAL DIA. x LENGTH	(mm)	φ16.4 x 1310
14	RAW MATERIAL WEIGHT	(Kgs)	2.3
15	RAW MATERIAL CODE		—
16	SPRING CODE		974624770000
17	PROCESS OF MANUFACTURE		[redacted]/COLD COILING & STRAIN HARDENED.

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON-IBR APPLICATION.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST. ASTM A 276 TYPE 316.

REV.		REV.	
03	ALTD:	02	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

RETRACED & UPDATED.

DCN: SR:0189 7.7.97

	NAME	SIGN	DATE
DRAWN	MRC / [redacted]		7.7.92
CHECKED	KSR / [redacted]		7.7.92
APPROVED	KSR / [redacted]		7.7.92

TITLE: SPRING

DRG No. 4-V-J270-21043 REVISION 02

CORPORATE DRG ID TP-DG-4-V-J270-21043

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CORPORATE DRG ID TP-DG-4-V-J270-21043

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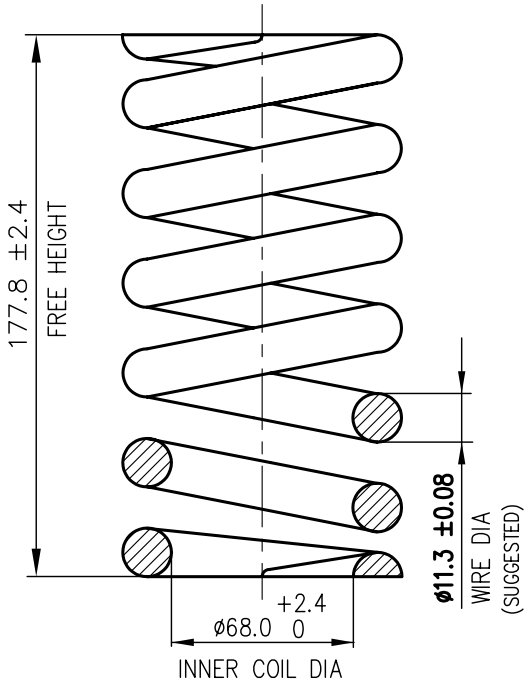

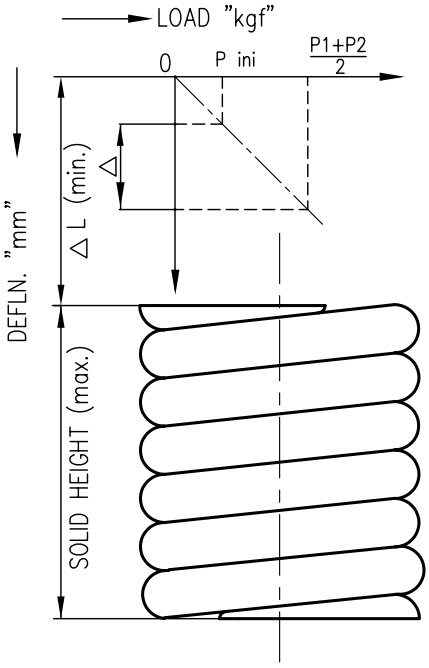

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103040CR**	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	4.678
04	AVERAGE DEFLECTION △L min.		(mm)	82.0
05	INITIAL LOADING P_{ini}		(Kgs)	57.6
06	TEST DEFLECTION △		(mm)	57.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	312.8
		P_2 MAX.	(Kgs)	339.6
08	TILT DEFLECTION		(mm)	69.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.1^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.5
11	PITCH	(mm)	24.1 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1865
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2510
14	RAW MATERIAL WEIGHT	(Kgs)	5.0
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931724150000** **974622780000** **964155920000**	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
02	ALTD: G.V	29.03.07	DRG. UPDATED REDRAWN IN CAD. DCP.NO.800666 DT.27.03.2007
	CHKD: E.A	29.03.07	
	APPD: E.A	29.03.07	
01	ALTD: G.V	11.02.05	SUB DELIVERY CODES ADDED. DRG. UPDATED AS SOFT COPY. DCP. NO. 800415
	CHKD: E.A	11.02.05	
	APPD: E.A	11.02.05	

	NAME	SIGN	DATE
DRAWN	G.venkateswaralu		10.02.05
CHECKED	E.Athiannavi		10.02.05
APPROVED	E.Athiannavi		10.02.05

TITLE: SPRING

DRG No. 4-V-J304-21415 REV. 02

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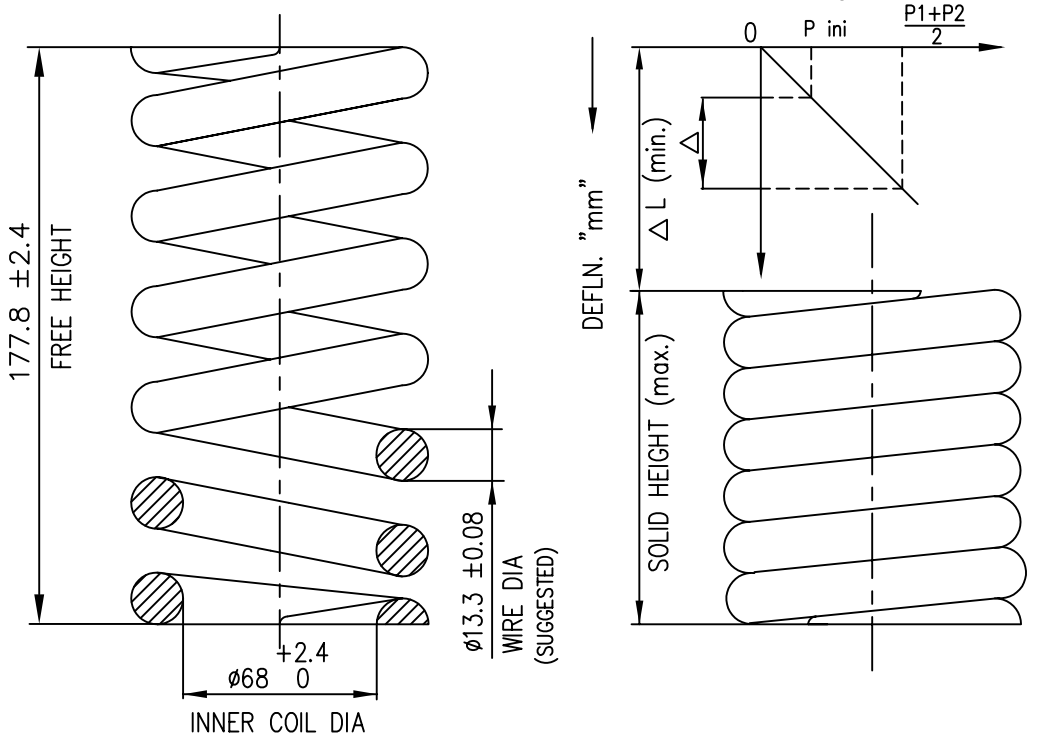

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0303070CR	
02	MAX. OUTSIDE DIA		(mm)	98.4
03	SPRING RATE		(Kg/mm)	9.052
04	AVERAGE DEFLECTION Δ L min.		(mm)	77.5
05	INITIAL LOADING P ini		(Kgs)	105.2
06	TEST DEFLECTION Δ		(mm)	54.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	571.6
		P_2 MAX.	(Kgs)	620.6
08	TILT DEFLECTION		(mm)	65.9

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.5^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	1.96
11	PITCH	(mm)	26.4 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1789
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2320
14	RAW MATERIAL WEIGHT	(Kgs)	4.634
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931726500900	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NO

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.6150.

REV.		REV.		
02	ALTD:	01	ALTD: G.V	23.11.05
	CHKD:		CHKD: E.A	23.11.05
	APPD:		APPD: E.A	23.11.05

WIRE DIA TOLERENCE CORRECTED.
DCP.NO.800519 DT.21.10.05

	NAME	SIGN	DATE
DRAWN	A.P.Sivam		22.05.04
CHECKED	E.Athiannavi		22.05.04
APPROVED	E.Athiannavi		22.05.04

TITLE: SPRING

DRG No. 4-V-J307-23650 REV. 01

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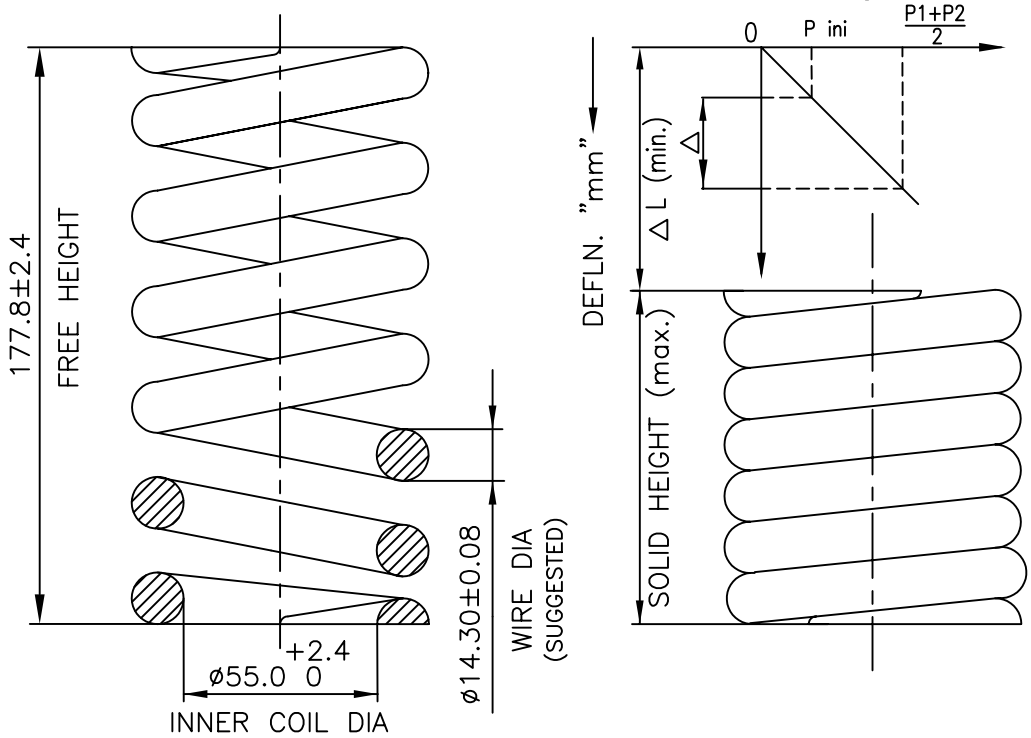
CORPORATE DRG ID
TP-DG-4-V-J307-23650

CORPORATE DRG ID
TP-DG-4-V-J307-23650

ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103100CR	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	17.944
04	AVERAGE DEFLECTION ΔL min.		(mm)	62.5
05	INITIAL LOADING P_{ini}		(Kgs)	168.2
06	TEST DEFLECTION Δ		(mm)	43.7
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	913.8
		P_2 MAX.	(Kgs)	992.3
08	TILT DEFLECTION		(mm)	53.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	$7.1-1\frac{0}{2}$
10	SPRING WEIGHT	(Kgs)	2.1
11	PITCH	(mm)	24.2±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1634
13	RAW MATERIAL DIA x LENGTH	(mm)	18X2140
14	RAW MATERIAL WEIGHT	(Kgs)	4.3
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931722060900	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.6150

REV.		REV.	
02	ALTD:	01	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	LRS		30.06.2004
CHECKED	VPP		30.06.2004
APPROVED	EA		30.06.2004

TITLE: SPRING

DRG No. 4-V-J310-23206 REV. 00

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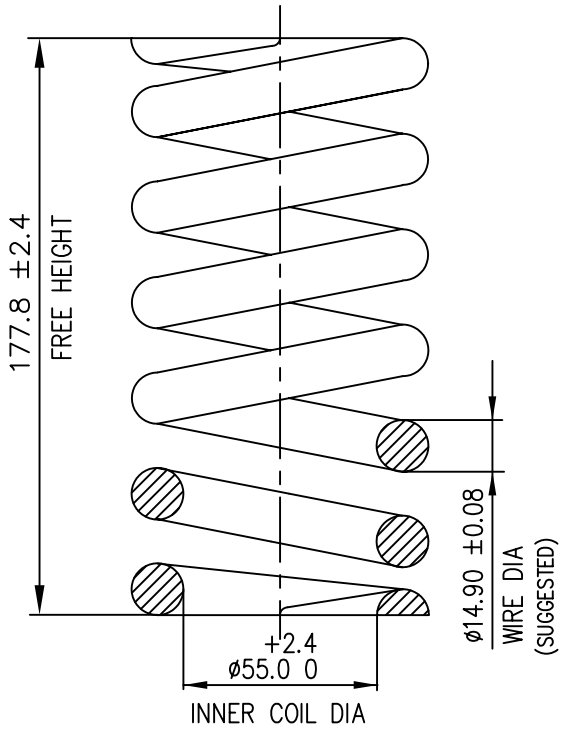
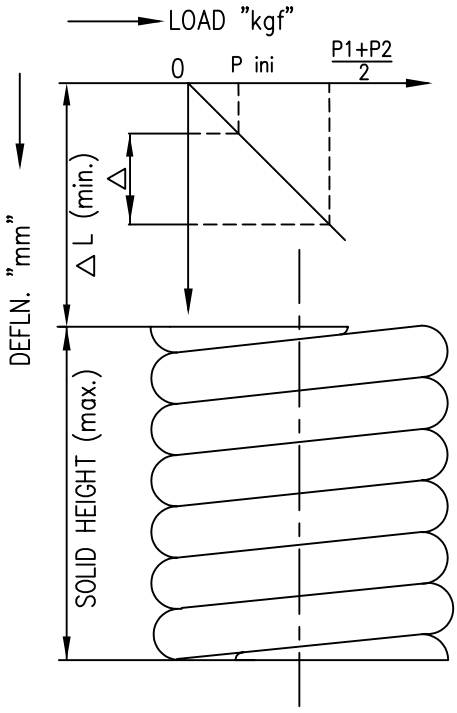
CORPORATE DRG ID
TP-DG-4-V-J310-23206

CORPORATE DRG ID
TP-DG-4-V-J310-23206

ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0103110CR	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	20.319
04	AVERAGE DEFLECTION △L min.		(mm)	58.1
05	INITIAL LOADING P ini		(Kgs)	177.0
06	TEST DEFLECTION △		(mm)	40.6
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	961.5
		P_2 MAX.	(Kgs)	1044.1
08	TILT DEFLECTION		(mm)	49.4

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.2^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.3
11	PITCH	(mm)	23.8 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1665
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2180
14	RAW MATERIAL WEIGHT	(Kgs)	4.4
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	931723590000	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON IBR APPLICATION.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST: ASTM A322 GR.6150/EN48A.

REV.				REV.	
02	ALTD:	G.V	DT.28.02.05	01	ALTD:
	CHKD:	E.A	DT.28.02.05		CHKD:
	APPD:	E.A	DT.28.02.05		APPD:
DRG. UPDATED AS SOFT COPY DCP.NO.800415.				RETRACED AND UPDATED DCN NO.SV:0459 DT.12.11.97	

	NAME	SIGN	DATE
DRAWN	G.Venkateshwaralu		28.02.05
CHECKED	E.Athiannavi		28.02.05
APPROVED	E.Athiannavi		28.02.05

TITLE SPRING

DRG No. 4-V-J311-21359 REV. 02

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CORPORATE DRG ID
TP-DG-4-V-J311-21359

CORPORATE DRG ID
TP-DG-4-V-J311-21359

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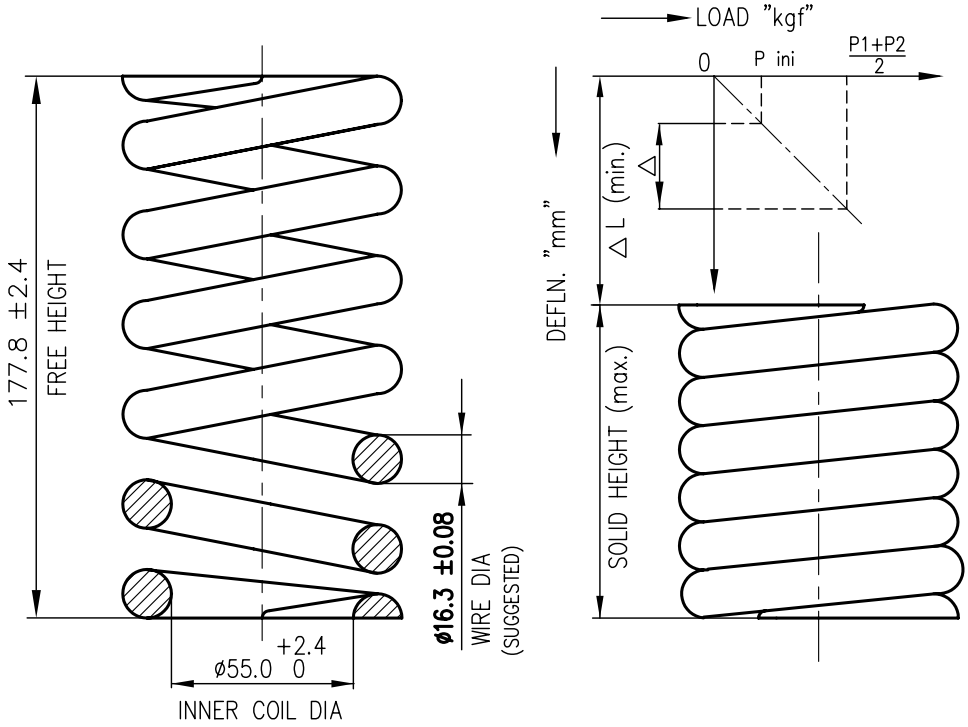

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103140CR**	
02	MAX. OUTSIDE DIA		(mm)	92.1
03	SPRING RATE		(Kg/mm)	29.818
04	AVERAGE DEFLECTION △L min.		(mm)	54.4
05	INITIAL LOADING P ini		(Kgs)	244.0
06	TEST DEFLECTION △		(mm)	38.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1321.0
		P_2 MAX.	(Kgs)	1435.0
08	TILT DEFLECTION		(mm)	46.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.6^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.6
11	PITCH	(mm)	26.0 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	1585.0
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25x2100
14	RAW MATERIAL WEIGHT	(Kgs)	8.0
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931720380000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
06	ALTD: G.V	04.06.07	
	CHKD: E.A	04.06.07	
	APPD: E.A	04.06.07	
05	ALTD: LRS	12.11.97	
	CHKD: VPP	12.11.97	
	APPD: KN	12.11.97	

DRG. UPDATED & REDRAWN IN CAD, DCP.NO.800666 DT.27.03.2007

RETRACED AND UPDATED DCN No.SV: 0459

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		04.06.07
CHECKED	E.ATHIANNAVI		04.06.07
APPROVED	E.ATHIANNAVI		04.06.07

TITLE: SPRING

DRG No. 4–V–J314–21038 REV. 06

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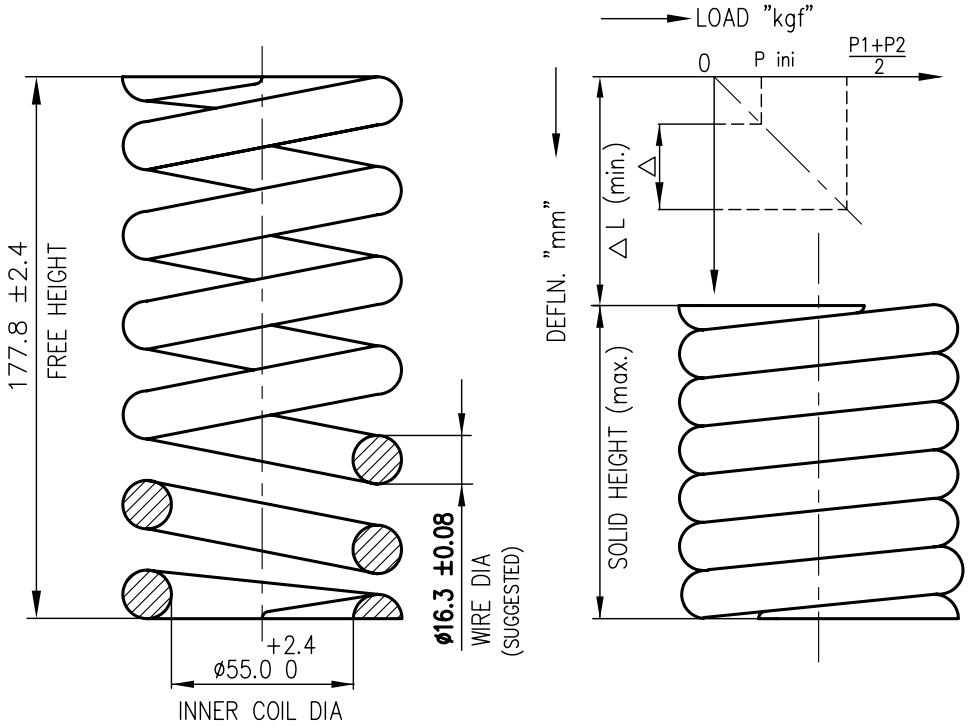

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0303140CR**	
02	MAX. OUTSIDE DIA		(mm)	98.4
03	SPRING RATE		(Kg/mm)	27.961
04	AVERAGE DEFLECTION Δ L min.		(mm)	49.8
05	INITIAL LOADING P_{ini}		(Kgs)	208.8
06	TEST DEFLECTION Δ		(mm)	34.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1134.5
		P_2 MAX.	(Kgs)	1231.9
08	TILT DEFLECTION		(mm)	42.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.1^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.741
11	PITCH	(mm)	23.9 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1673
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25x2190
14	RAW MATERIAL WEIGHT	(Kgs)	8.439
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931724410000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	21.06.07
	CHKD:		CHKD: E.A	21.06.07
	APPD:		APPD: E.A	21.06.07

DRG. UPDATED & REDRAWN IN CAD, DCP.NO.800666 DT.27.03.2007

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		21.06.07
CHECKED	E.Athiannavi		21.06.07
APPROVED	E.Athiannavi		21.06.07

TITLE: SPRING

DRG No. 4–V–J314–21441 REV. 01

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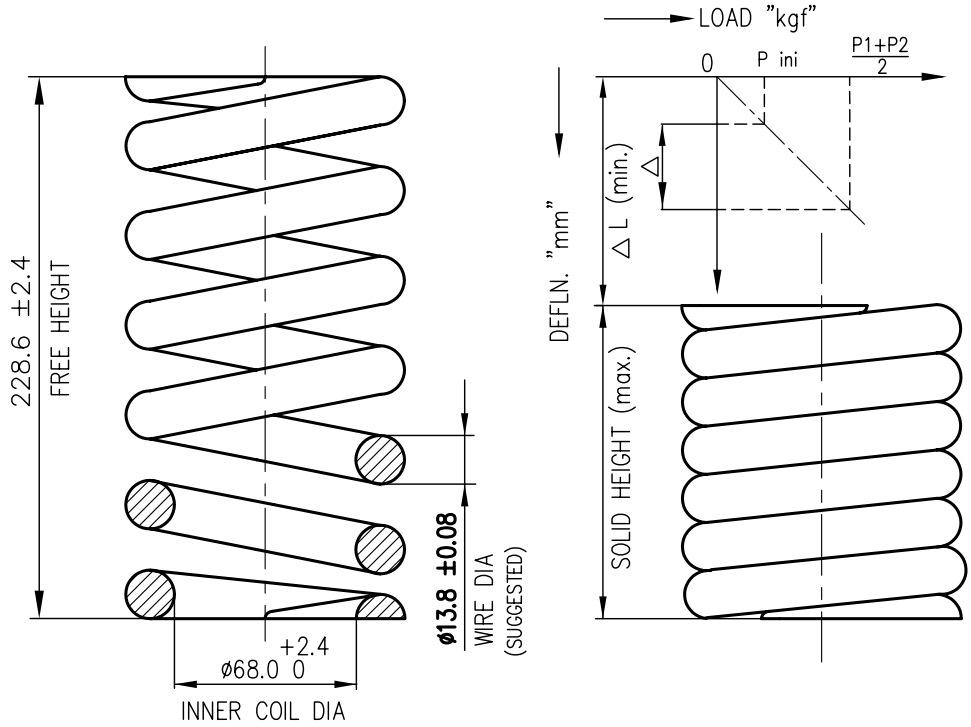

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103840CR**	
02	MAX. OUTSIDE DIA		(mm)	123.8
03	SPRING RATE		(Kg/mm)	7.856
04	AVERAGE DEFLECTION △L min.		(mm)	100.6
05	INITIAL LOADING P_{ini}		(Kgs)	118.6
06	TEST DEFLECTION △		(mm)	70.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	644.0
		P_2 MAX.	(Kgs)	699.3
08	TILT DEFLECTION		(mm)	85.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$8.5^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.7
11	PITCH	(mm)	26.7 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2269
13	RAW MATERIAL DIA x LENGTH	(mm)	ø18x2800
14	RAW MATERIAL WEIGHT	(Kgs)	5.6
15	RAW MATERIAL CODE	153274050100	
16	SPRING CODE	**931726890000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.	ALTD:	REV.	ALTD:
02	CHKD:	01	CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		20.03.07
CHECKED	E.Athiannavi		20.03.07
APPROVED	E.Athiannavi		20.03.07

TITLE: SPRING

DRG No. 4-V-J384-21689 REV. 00

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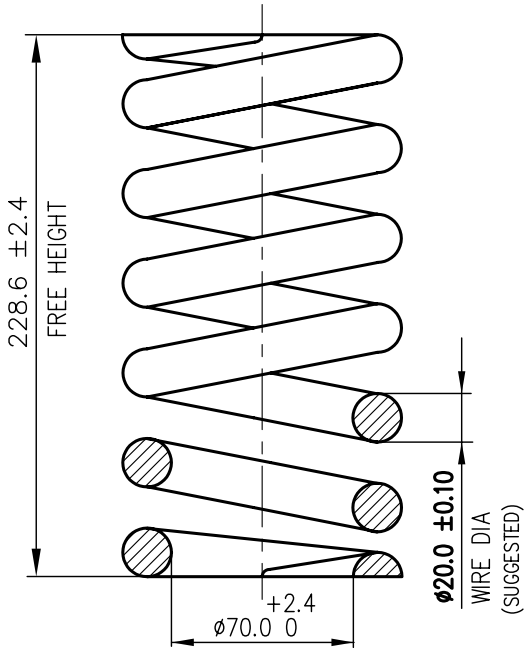

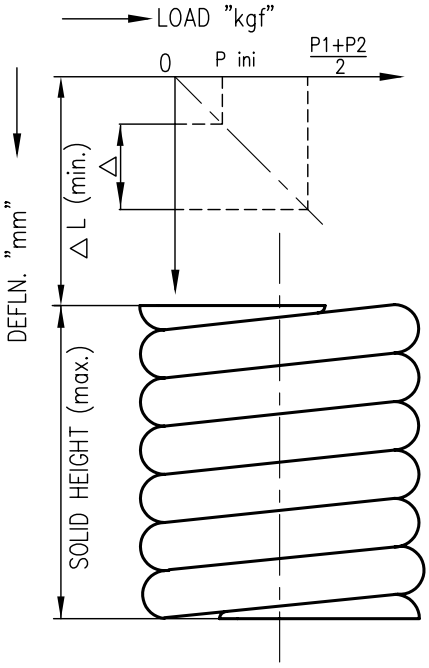

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0103930CR**	
02	MAX. OUTSIDE DIA		(mm)	123.8
03	SPRING RATE		(Kg/mm)	31.960
04	AVERAGE DEFLECTION △L min.		(mm)	73.2
05	INITIAL LOADING P_{ini}		(Kgs)	350.7
06	TEST DEFLECTION △		(mm)	51.2
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1905.4
		P_2 MAX.	(Kgs)	2069.1
08	TILT DEFLECTION		(mm)	62.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.9\ ^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	5.1
11	PITCH	(mm)	31.3 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	2087
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25x2630
14	RAW MATERIAL WEIGHT	(Kgs)	10.1
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931724910000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				
02	ALTD:	REV. 01	ALTD: G.V	15.06.07
	CHKD:		CHKD: E.A	15.06.07
	APPD:		APPD: E.A	15.06.07

DRG. UPDATED & REDRAWN IN CAD, DCP.NO.800666 DT.27.03.2007

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		15.06.07
CHECKED	E.Athiannavi		15.06.07
APPROVED	E.Athiannavi		15.06.07

TITLE: SPRING

DRG No. 4-V-J393-21491 REV. 01

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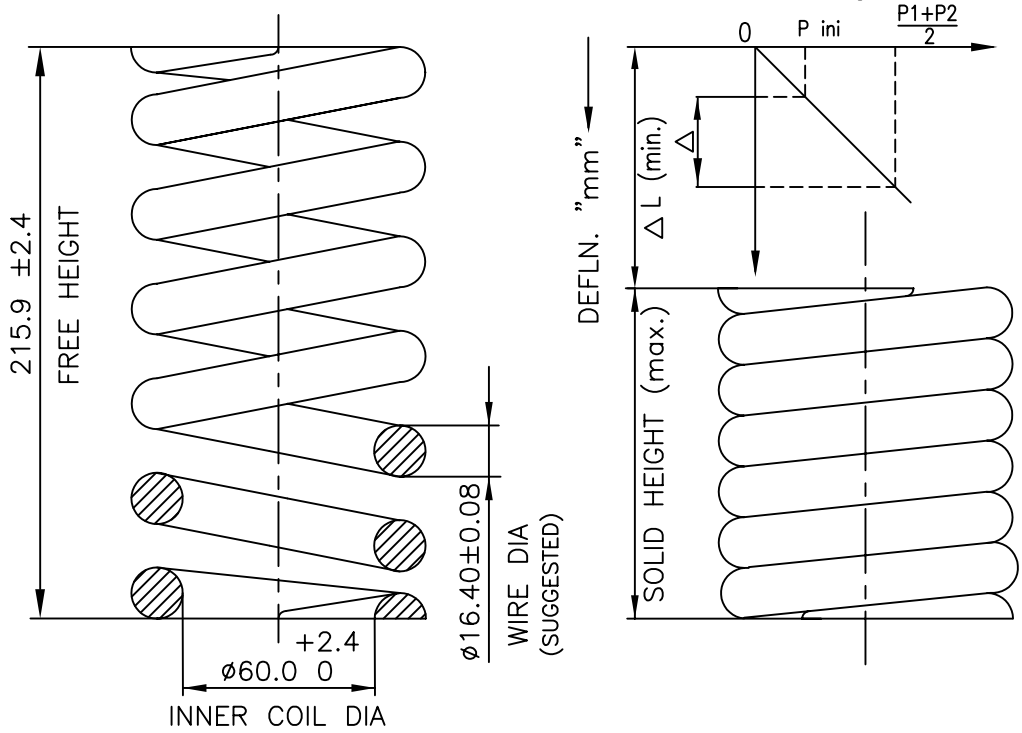
ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0104090CR	
02	MAX. OUTSIDE DIA		(mm)	101.6
03	SPRING RATE		(Kg/mm)	21.105
04	AVERAGE DEFLECTION ΔL min.		(mm)	72.9
05	INITIAL LOADING P_{ini}		(Kgs)	230.8
06	TEST DEFLECTION Δ		(mm)	51.0
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1253.9
		P_2 MAX.	(Kgs)	1361.5
08	TILT DEFLECTION		(mm)	62.0

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	$7.8-1\frac{0}{2}$
10	SPRING WEIGHT	(Kgs)	3.2
11	PITCH	(mm)	27.0±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	1954
13	RAW MATERIAL DIA x LENGTH	(mm)	25X2480
14	RAW MATERIAL WEIGHT	(Kgs)	9.6
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	931721300900	
17	PROCESS OF MANUFACTURE	HOT COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A322 GR.6150/EN48A

REV.02	ALTD:	REV.01	ALTD:
	CHKD:		CHKD:
	APPD:		APPD:

	NAME	SIGN	DATE
DRAWN	LRS		12.01.2005
CHECKED	VP		12.01.2005
APPROVED	EA		12.01.2005

TITLE SPRING

DRG No. 4-V-J409-23130 REV. 00

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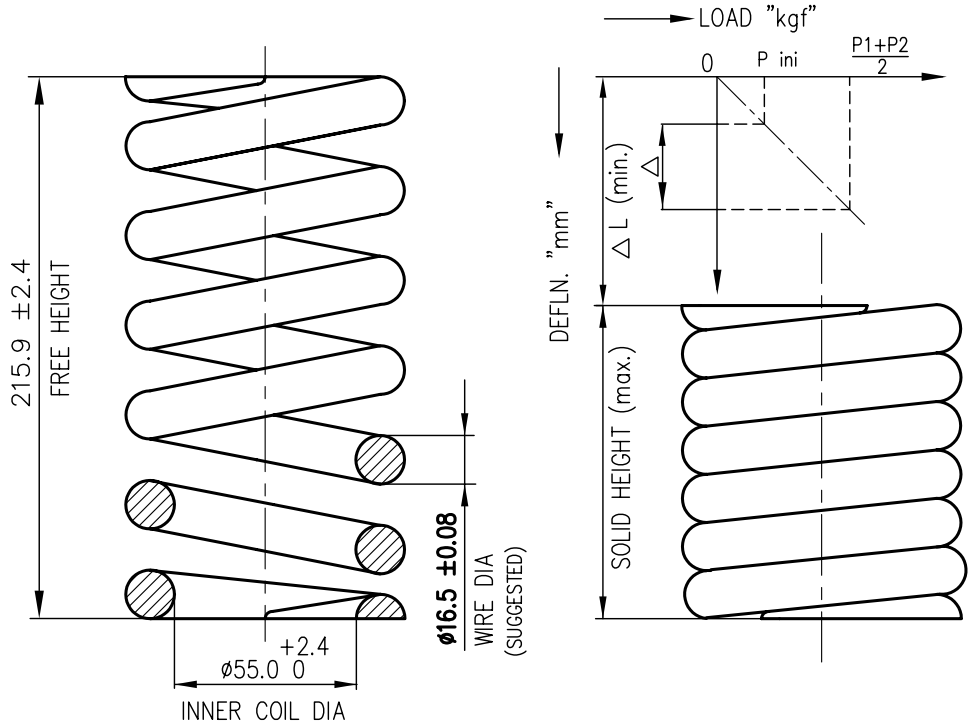
CORPORATE DRG ID
TP-DG-4-V-J409-23130

CORPORATE DRG ID
TP-DG-4-V-J409-23130

ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0104100CR**	
02	MAX. OUTSIDE DIA		(mm)	101.6
03	SPRING RATE		(Kg/mm)	24.372
04	AVERAGE DEFLECTION △L min.		(mm)	64.8
05	INITIAL LOADING P_{ini}		(Kgs)	236.8
06	TEST DEFLECTION △		(mm)	45.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1286.5
		P_2 MAX.	(Kgs)	1397.1
08	TILT DEFLECTION		(mm)	55.1

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$8.5^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	3.3
11	PITCH	(mm)	24.9 ±0.8
12	DEVELOPED LENGTH OF ROD	(mm)	1961
13	RAW MATERIAL DIA x LENGTH	(mm)	25 x 2470
14	RAW MATERIAL WEIGHT	(Kgs)	9.5
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931721670000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
04	ALTD:		03	ALTD: G.V	04.05.07
	CHKD:			CHKD: E.A	04.05.07
	APPD:			APPD: E.A	04.05.07

DRG. UPDATED & REDRAWN IN CAD, DCP.NO.800666 DT.27.03.2007

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		04.05.07
CHECKED	E.Athiannavi		04.05.07
APPROVED	E.Athiannavi		04.05.07

TITLE: SPRING

DRG No. 4–V–J410–21167 REV. 03

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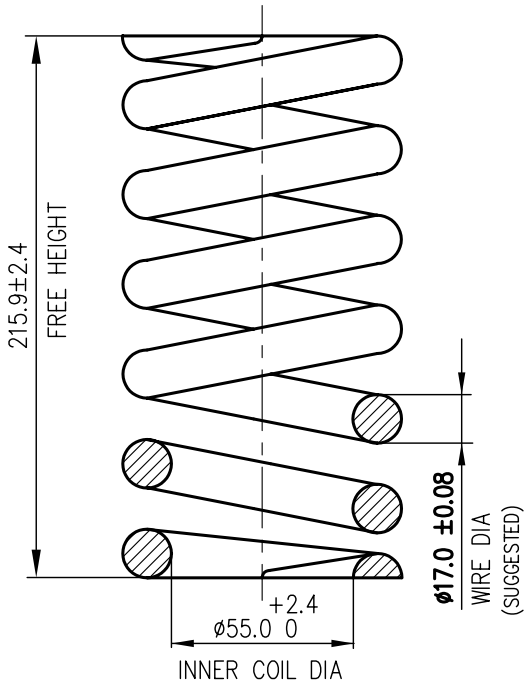

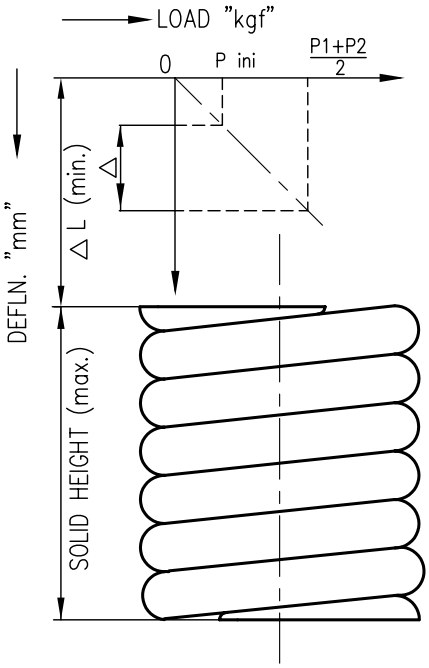

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0104110CR**	
02	MAX. OUTSIDE DIA		mm	101.6
03	SPRING RATE		Kg/mm	27.318
04	AVERAGE DEFLECTION ΔL min.		mm	62.0
05	INITIAL LOADING P_{ini}		Kg	254.0
06	TEST DEFLECTION Δ		mm	43.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	1379.9
		P_2 MAX.	Kg	1498.4
08	TILT DEFLECTION		mm	52.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$8.3^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	3.5
11	PITCH	mm	25.2 ±0.9
12	DEVELOPED LENGTH OF ROD	mm	1948
13	RAW MATERIAL DIA x LENGTH	mm	ø25x2460
14	RAW MATERIAL WEIGHT	Kg	9.5
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931723620000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST:** ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			REV.		
02	ALTD:		01	ALTD: G.V	19.08.06
	CHKD:			CHKD: E.A	19.08.06
	APPD:			APPD: E.A	19.08.06

DRG. UPDATED & REDRAWN IN CAD.
DCP. NO. 800602 DT.01.08.06

	NAME	SIGN	DATE
DRAWN	A.Paramu		22.11.02
CHECKED	K.S.Raju		22.11.02
APPROVED	K.S.Raju		22.11.02

TITLE: SPRING

DRG No. 4–V–J411–21362 REV. 01

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CORPORATE DRG ID
TP-DG-4-V-J413-21431

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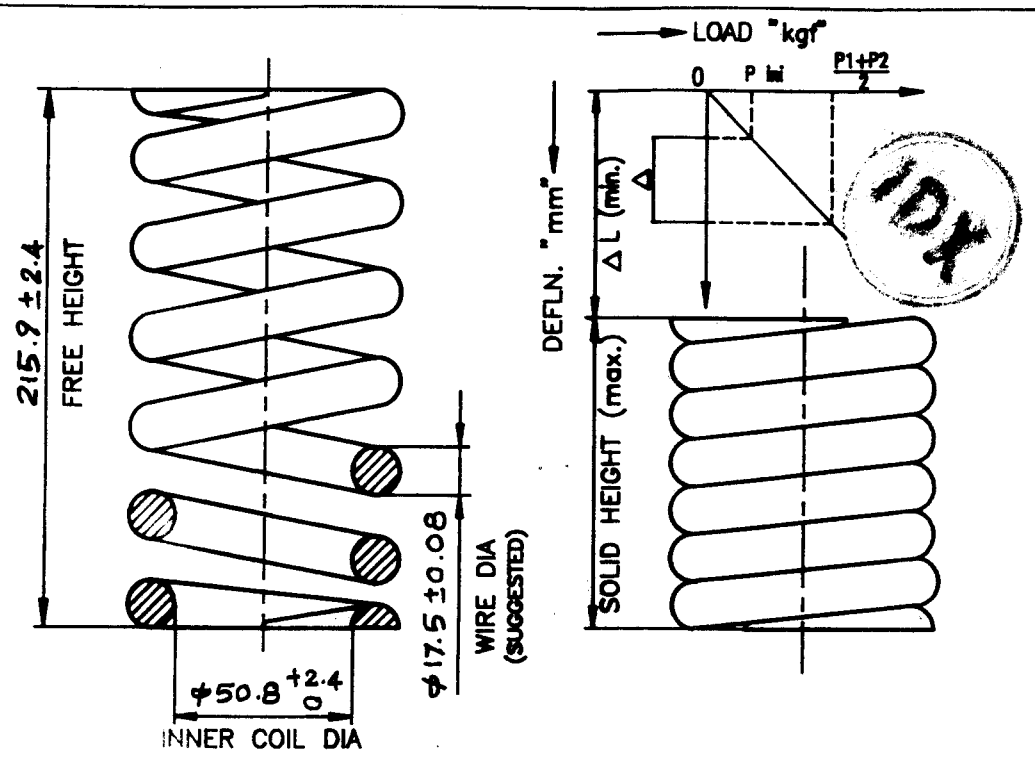


ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		-	01041305Y
02	MAX. OUTSIDE DIA		(mm)	101.6
03	SPRING RATE		(Kg/mm)	35.263
04	AVERAGE DEFLECTION ΔL min.		(mm)	62.1
05	INITIAL LOADING P_{ini}		(Kgs)	328.2
06	TEST DEFLECTION Δ		(mm)	43.4
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	1783.4
		P_2 MAX.	(Kgs)	1936.6
08	TILT DEFLECTION		(mm)	52.8
09	EFFECTIVE NO.OF COILS		NOS	7.2 ±0.25
10	SPRING WEIGHT		(Kgs)	3.5
11	PITCH		(mm)	22.3±0.8
12	DEVELOPED LENGTH OF ROD		(mm)	1870
13	RAW MATERIAL LENGTH		(mm)	2370
14	RAW MATERIAL WEIGHT		(Kgs)	9.1
15	RAW MATERIAL SIZE & CODE		φ25x2370	—
16	SPRING CODE		-	97462616

ALL DIMENSIONS ARE IN MM

NOTES:

1. MANUFACTURE & WORKMANSHIP – SHALL BE IN ACCORDANCE WITH APPLICABLE QUALITY PROCEDURE FOR NON-IBR APPLICATION.
2. PROCESS OF MANUFACTURE : [redacted]/COLD COILING
3. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
4. ACCEPTABLE SPRING MATERIAL TO PRODUCT ATTEST. A276 - TY 316.
5. SPRING SHOULD NOT BE COMPRESSED MORE THAN 51 mm.

	NAME	SIGN	DATE
DRAWN	MRC / KPL		15/3/95
CHECKED	KSR / VPP		15/3/95
APPROVED	VM / JN		16/3/95

BHEL

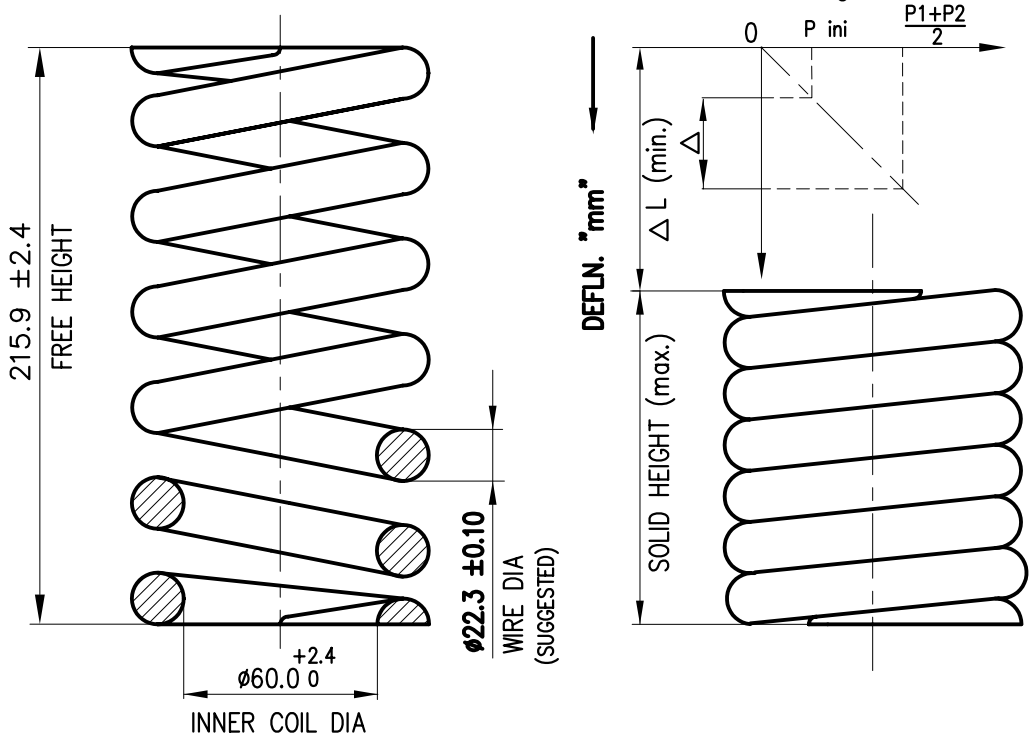
SPRING

DR. 4-V-J413-21431

REVISION 00

CORPORATE DRG ID
TP-DG-4-V-J413-21431

ALL DIMENSIONS ARE IN MM



ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0104190CR**	
02	MAX. OUTSIDE DIA		mm	144.3
03	SPRING RATE		Kg/mm	68.295
04	AVERAGE DEFLECTION Δ L min.		mm	49.3
05	INITIAL LOADING P ini		Kg	505.0
06	TEST DEFLECTION Δ		mm	34.5
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	2743.0
		P_2 MAX.	Kg	2978.0
08	TILT DEFLECTION		mm	41.9

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.6\ ^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	5.6
11	PITCH	mm	30.4 ±1.0
12	DEVELOPED LENGTH OF ROD	mm	1821
13	RAW MATERIAL DIA x LENGTH	mm	ø30x2400
14	RAW MATERIAL WEIGHT	Kg	13.3
15	RAW MATERIAL CODE	153274100000	
16	SPRING CODE	**931720620000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
05	ALTD: G.V	26.10.07	
	CHKD: E.A	26.10.07	
	APPD: E.A	26.10.07	

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.07

REV.			
04	ALTD:	LRS	27.12.97
	CHKD:	VPP	27.12.97
	APPD:	KN	27.12.97

RETRACED AND UPDATED
DCN NO. SV:0361

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		26.10.07
CHECKED	E.ATHIANNAVI		26.10.07
APPROVED	E.ATHIANNAVI		26.10.07

TITLE: SPRING

DRG No. 4-V-J419-21062 REV. 05

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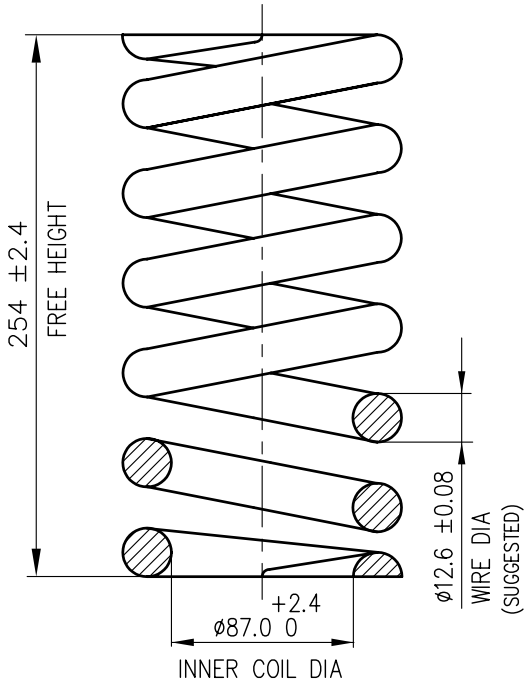

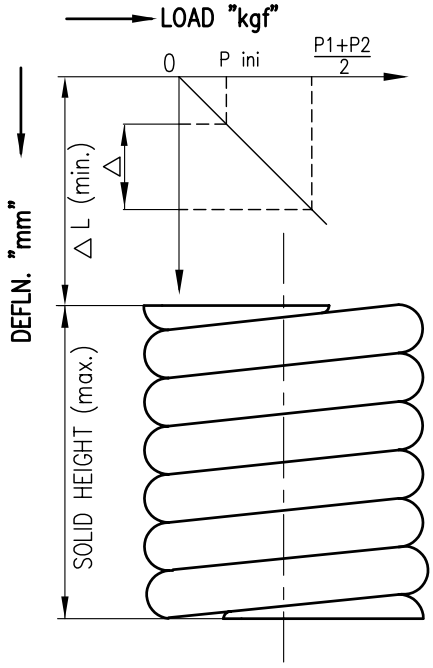

ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		0106320CR	
02	MAX. OUTSIDE DIA		(mm)	139.7
03	SPRING RATE		(Kg/mm)	3.526
04	AVERAGE DEFLECTION △L min.		(mm)	145.5
05	INITIAL LOADING P_{ini}		(Kgs)	77.0
06	TEST DEFLECTION △		(mm)	101.9
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	418.3
		P_2 MAX.	(Kgs)	454.2
08	TILT DEFLECTION		(mm)	123.7

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$7.3\ ^{+0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	2.37
11	PITCH	(mm)	34.3±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2416
13	RAW MATERIAL DIA x LENGTH	(mm)	3130
14	RAW MATERIAL WEIGHT	(Kgs)	6.25
15	RAW MATERIAL CODE	–	
16	SPRING CODE	931723070900/ 974627600900	
17	PROCESS OF MANUFACTURE	HOT/COLD COILING (NOTE-4)	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR IBR SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO ATTEST: ASTM A304-6150H,ASTM A322-6150,BS970/2-735A51, BS970/2-735H51,BS2803-735A50,BS2803-685A55.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.
5. TEST CERTIFICATE TO BE OBTAINED WITH LLOYD'S SIGNATURE IF IMPORTED

REV.			REV.		
02	ALTD:		01	ALTD: G.V	01.03.06
	CHKD:			CHKD: E.A	01.03.06
	APPD:			APPD: E.A	01.03.06
		MATERIAL LIST ADDED & NOTES UPDATED. DCP.NO.800519 DT.21.10.05			

	NAME	SIGN	DATE
DRAWN	A.Paramasivam		16.08.04
CHECKED	E.Athiannavi		16.08.04
APPROVED	E.Athiannavi		16.08.04

TITLE: SPRING

DRG No. 4-V-J632-23307 REV. 01

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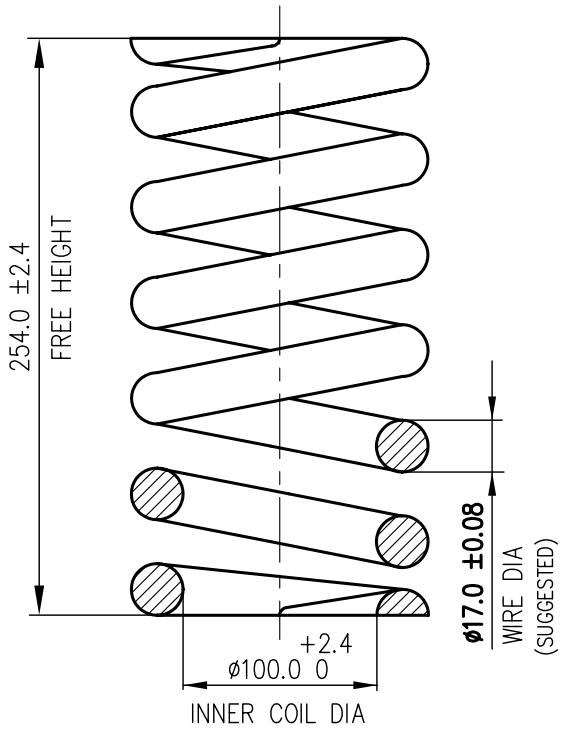
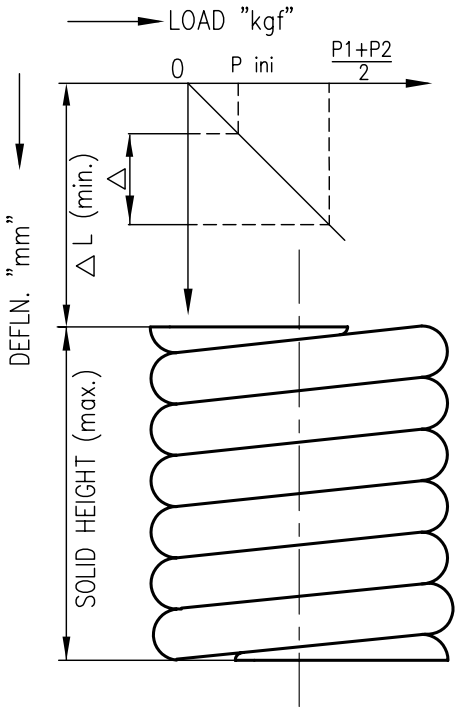
CORPORATE DRG ID
TP-DG-4-V-J632-23307

CORPORATE DRG ID
TP-DG-4-V-J632-23307

ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0106350CR**	
02	MAX. OUTSIDE DIA		(mm)	139.7
03	SPRING RATE		(Kg/mm)	8.267
04	AVERAGE DEFLECTION △L min.		(mm)	129.6
05	INITIAL LOADING P ini		(Kgs)	160.8
06	TEST DEFLECTION △		(mm)	90.8
07	LOAD AT TEST DEFLECTION	P_1 MIN.	(Kgs)	873.5
		P_2 MAX.	(Kgs)	948.5
08	TILT DEFLECTION		(mm)	110.2

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.4^{0}_{-0.5}$
10	SPRING WEIGHT	(Kgs)	4.5
11	PITCH	(mm)	39.3 ±1.0
12	DEVELOPED LENGTH OF ROD	(mm)	2521
13	RAW MATERIAL DIA x LENGTH	(mm)	ø25x3110
14	RAW MATERIAL WEIGHT	(Kgs)	12.0
15	RAW MATERIAL CODE	153274090000	
16	SPRING CODE	**931722340000**	
17	PROCESS OF MANUFACTURE	HOT/~~COLD~~ COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NONIBR** SPRINGS.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.				REV.			
02	ALTD: G.V	20.06.07		01	ALTD: AP	07.07.97	
	CHKD: E.A	20.06.07			CHKD: KSR	07.07.97	
	APPD: E.A	20.06.07			APPD: KSR	07.07.97	

DRG. UPDATED REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.2007

RETRACED & UPDATED.
DCN: SR: 0189

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		20.06.07
CHECKED	E.Athiannavi		20.06.07
APPROVED	E.Athiannavi		20.06.0

TITLE: SPRING

DRG No. 4-V-J635-21234 REV. 02

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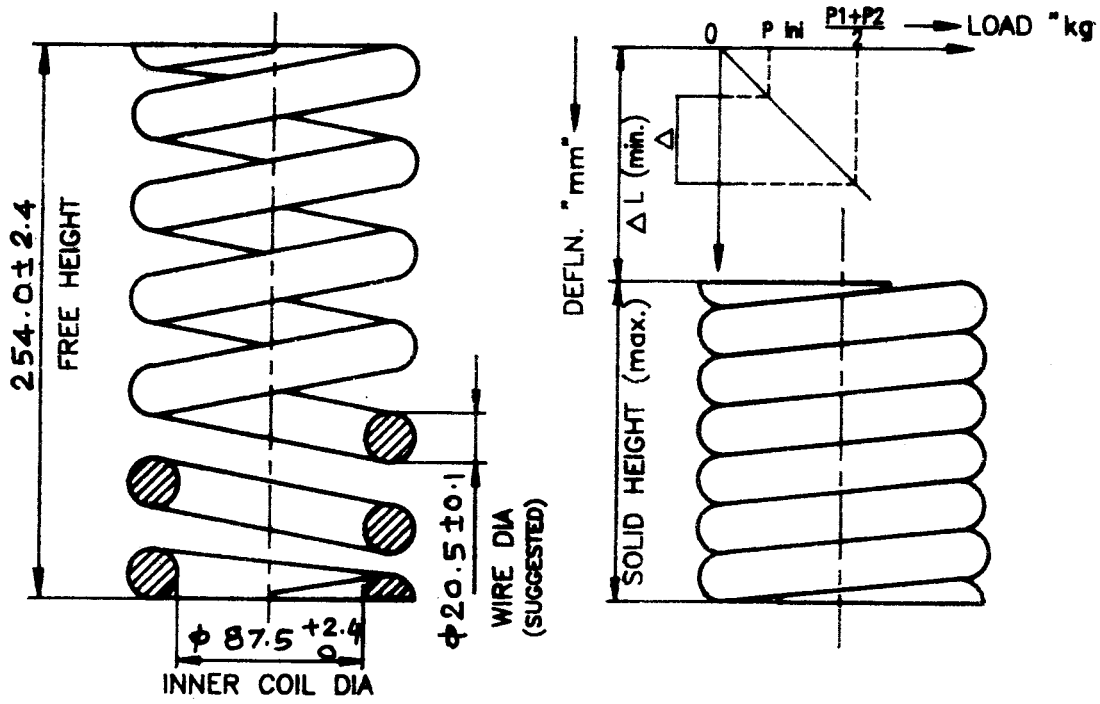


ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		01063905Y	
02	MAX. OUTSIDE DIA		(mm)	139.7
03	SPRING RATE		(Kg/mm)	17.855
04	AVERAGE DEFLECTION ΔL min.		(mm)	121.1
05	INITIAL LOADING P ini		(Kgs)	324.4
06	TEST DEFLECTION Δ		(mm)	48.8
07	LOAD AT TEST DEFLECTION	P1 MIN.	(Kgs)	1135.7
		P2 MAX.	(Kgs)	1255.2
08	TILT DEFLECTION		(mm)	70.3

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO.OF COILS	NOS	6.8±0.25
10	SPRING WEIGHT	(Kgs)	6.9
11	PITCH	(mm)	33 ±0.9
12	DEVELOPED LENGTH OF ROD	(mm)	2650
13	RAW MATERIAL DIA. x LENGTH	(mm)	φ21×3020
14	RAW MATERIAL WEIGHT	(Kgs)	7.8
15	RAW MATERIAL CODE		—
16	SPRING CODE		974624570000
17	PROCESS OF MANUFACTURE		[redacted]/COLD COILING & STRAIN HARDENED.

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR NON-IBR APPLICATION.
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERENCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO PRODUCT ATTEST. ASTM A 276 TYPE 316.
4. SPRING SHOULD NOT BE COMPRESSED BEYOND 70.3 MM.

REV.	ALTD:	REV.	ALTD:
03	CHKD:	02	CHKD:
	APPD:		APPD:

RETRACED & UPDATED.

DCN: SR:0189 7.7.97

	NAME	SIGN	DATE
DRAWN	MRC / [redacted]		7.7.97
CHECKED	KSR / [redacted]		7.7.97
APPROVED	KSR / [redacted]		7.7.97

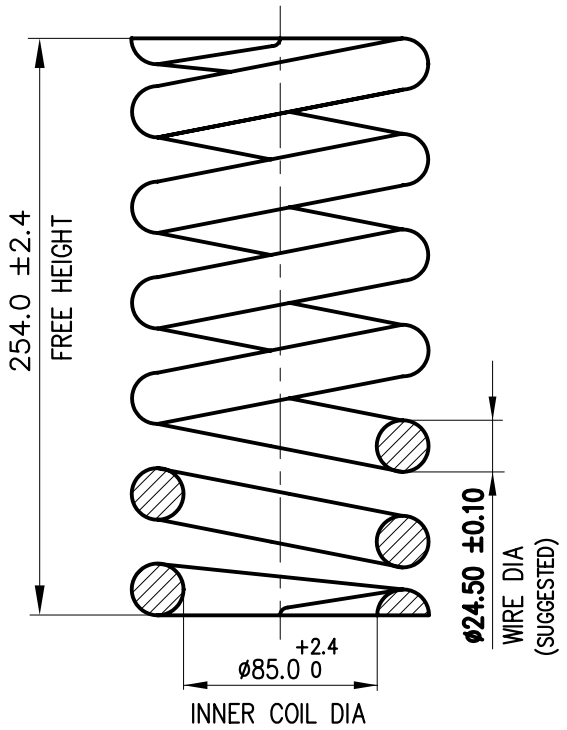
TITLE: SPRING

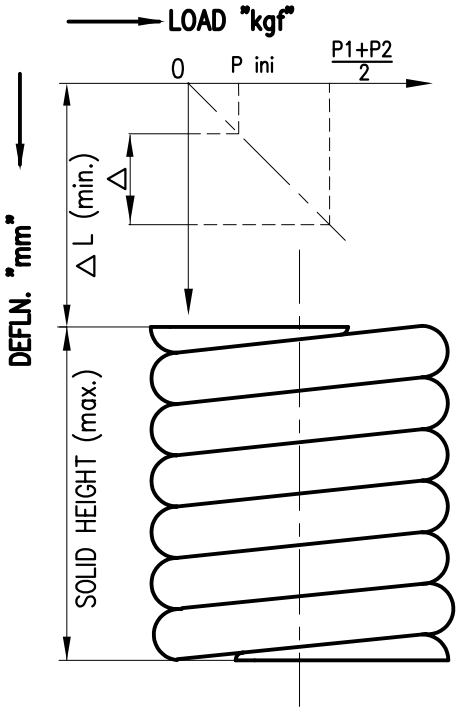
DRG No. 4-V-J639-21027 REVISION 02

CORPORATE DRG ID
TP-DG-4-V-J639-21027

CORPORATE DRG ID
TP-DG-4-V-J639-21027

ALL DIMENSIONS ARE IN MM





ROW	DESCRIPTION		UNITS	VALUE
01	SPRING NUMBER		**0106470CR**	
02	MAX. OUTSIDE DIA		mm	139.7
03	SPRING RATE		Kg/mm	45.512
04	AVERAGE DEFLECTION Δ L min.		mm	81.6
05	INITIAL LOADING P ini		Kg	598.2
06	TEST DEFLECTION Δ		mm	61.3
07	LOAD AT TEST DEFLECTION	P_1 MIN.	Kg	3250.4
		P_2 MAX.	Kg	3529.6
08	TILT DEFLECTION		mm	74.5

ROW	DESCRIPTION	UNITS	VALUE
09	EFFECTIVE NO. OF COILS	NOS	$6.1^{0}_{-0.5}$
10	SPRING WEIGHT	Kg	8.4
11	PITCH	mm	39.0 ±1.0
12	DEVELOPED LENGTH OF ROD	mm	2273
13	RAW MATERIAL DIA x LENGTH	mm	ø30x2980
14	RAW MATERIAL WEIGHT	Kg	16.5
15	RAW MATERIAL CODE	153274100000	
16	SPRING CODE	**931723290000**	
17	PROCESS OF MANUFACTURE	HOT COILING	

NOTES:

1. MANUFACTURE & WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPLICABLE PROCEDURE FOR **NON IBR** SPRINGS
2. DATA GIVEN IN ROWS 11 TO 14 ARE FOR REFERANCE ONLY. SPRING VENDOR TO DECIDE SUITABILITY.
3. ACCEPTABLE SPRING MATERIALS TO **PRODUCT ATTEST**: ASTM A322 GR.6150.
4. SPRING VENDOR IS RESPONSIBLE FOR STRESS RELIEVING, TEMPERING AND OTHER HEAT TREATMENTS AND CONTROLS TO INSURE MINIMUM STRESSED SPRINGS.

REV.			
03	ALTD: G.V	26.10.07	
	CHKD: E.A	26.10.07	
	APPD: E.A	26.10.07	

DRG. UPDATED & REDRAWN IN CAD.
DCP.NO.800666 DT.27.03.07

REV.			
02	ALTD:	LRS	12.11.97
	CHKD:	VPP	12.11.97
	APPD:	KN	12.11.97

RETRACED AND UPDATED
DCN NO. SV:0459

	NAME	SIGN	DATE
DRAWN	G.VENKATESWARALU		26.10.07
CHECKED	E.ATHIANNAVI		26.10.07
APPROVED	E.ATHIANNAVI		26.10.0

TITLE: SPRING

DRG No. 4-V-J647-21329 REV. 03

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