

DRAWING NUMBER
20-20-24

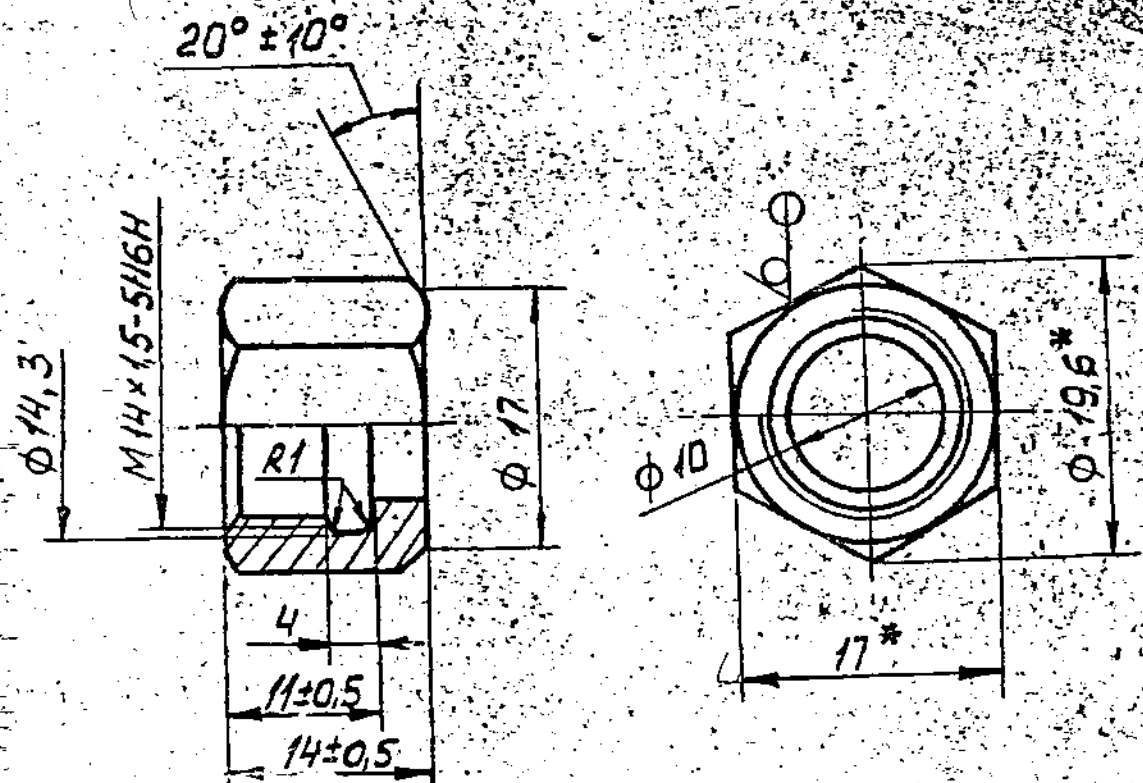
Rz40 ✓ (✓)

EXPLANATORY NOTE

Material Quoted = Steel 17-5 GOST 8560-78
45X GOST 4543-71

Bright steel hexagonal bar 17mm A/F

5 = Class of accuracy



45X = CHROMIUM STEEL GRADE

CHEMICAL COMPOSITION % (As per GOST 4543-71)

C = 0.41-0.49, Si = 0.17 - 0.37, Mn = 0.50 - 0.80,

Cr = 0.80 - 1.10, P = 0.035 (max), S = 0.035 (max),

Cu = 0.30 (max), Ni = 0.30 (max).

MECHANICAL PROPERTIES

HARDENING TEMPERATURE °C = 840

COOLING MEDIUM = OIL

TEMPERING TEMPERATURE °C = 520

COOLING MEDIUM = WATER OR OIL

YIELD POINT Kgf/mm² (min) = 85

ULTIMATE TENSILE STRENGTH Kgf/mm² (min) = 105

RELATIVE ELONGATION % = 9 (min)

RELATIVE REDUCTION ACROSS SECTION % (min) = 45

IMPACT STRENGTH Kgf/cm² = 5 (min)

Ⓐ EQUIVALENT MATERIAL STEEL 709M40 (EN19)
BS:970/40 Cr 4 Mo3 IS:1570

1. Inspection group IV as per technical requirements TT-11, HRC 24 to 30.

2. Unspecified limit deviations of machined dimensions are as follows:

For holes - As per A7

Shafts - As per B7

Others + As per CM7

3. DIMENSIONS ARE GIVEN FOR REFERENCE

USED ON: C6.20-35-13
C6.20-20-03-7,
C6.20-20-04-3, C6.20-22-03-7,
C6.20-23-75-1.

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION

EST. WT. TO BE STAMPED OR MARKED WHERE INDICATED THIS # (LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRM			
CHK			
YCD			
APPO			
DATE	20-2-91		
SCALE	2:1		
DIMENSIONS IN mm			
TOLERANCE ON DIMNS			
UNLESS OTHERWISE STATED IS:2102-69			
ALL THREADS TO CONFORM TO			
ISSUE DATE	12-8-10		
NATURE OF AMENDMENTS	4 th Alt. Comm. Meeting Minutes Point NO. 11 Dt. 26.10.09		

MATERIAL:- STEEL 17-5 GOST 8560-78 45X GOST 4543-71	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES) AVADI
TITLE PRESSURE NUT	D S CAT NUMBER
DRAWING NUMBER 20-20-24	

ISSUE 1300-81



SIZE A3

EXPLANATORY NOTE :

11. MATERIAL QUOTED : 19 GOST 8560-78
45 GOST 1050-74

Alt Matl QUOTED : 40X, 45X, GOST 4543-71. PIPE 16x4 GOST 9567-75
45b GOST 8733-74

19. WIDTH ACROSS FLATS AS PER 8560-78.

40X, 45X AND 45 GRADES OF STEEL AS PER GOST 4543-71

AND GOST 1050-74 RESPECTIVELY.

b = KILLED STEEL OF GRADE 45 AS PER GOST 1050-74.

PIPE OUTER DIAMETER = 16mm

VERY THICK WALLED = 4mm THICK } AS PER GOST 9567-75.

(a) CHEMICAL COMPOSITION : (AS PER GOST 1050-74 GRADE 45)

C = 0.42 - 0.50 Cr = 0.25 (max) , S = 0.040 (max) , P = 0.035 (max)
Si = 0.17 - 0.37
Mn = 0.50 - 0.80 Cu = 0.25 (max) , Ni = 0.25 (max)

(b) CHEMICAL COMPOSITION : (AS PER GOST 4543-71)

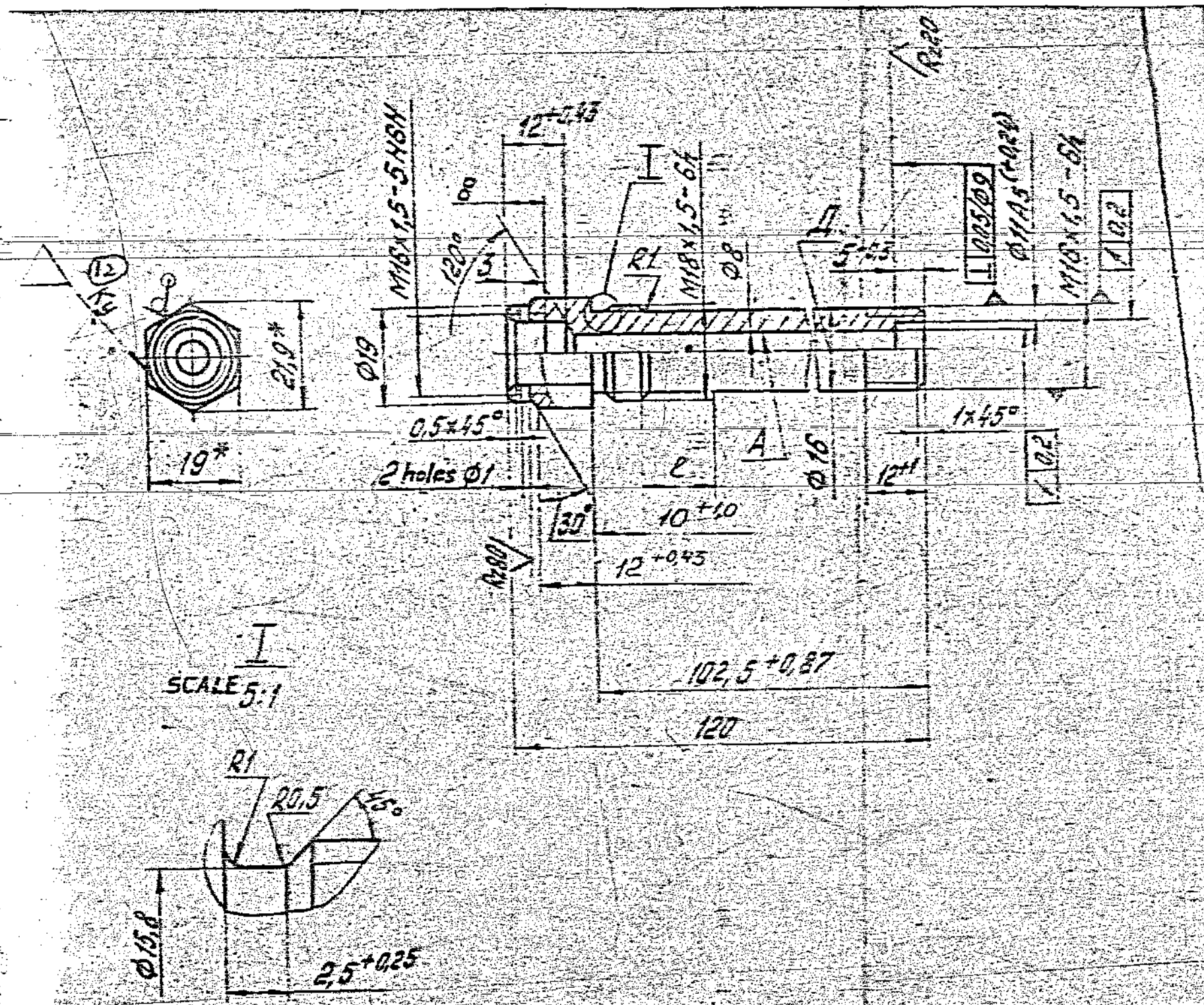
GRADE OF STEEL	CONTENT OF ELEMENTS				%						
	C	Si	Mn	Cr	P	S	Cu	Ni			
					M	A	X	I	N	U	M
40X	0.36-0.44	0.17-0.37	0.50-0.80	0.80-1.10	0.035	0.035	0.30	0.30			
45X	0.41-0.49	0.17-0.37	0.50-0.80	0.80-1.10	0.035	0.035	0.30	0.30			

(c) MECHANICAL PROPERTIES : (AS PER GOST 1050-74 GRADE-45)

YIELD POINT Kgf/mm² = 36 (min)
ULTIMATE TENSILE STRENGTH Kgf/mm² = 61 (min)
% ELONGATION = 16 (min)
REDUCTION IN AREA % = 40 (min)
IMPACT STRENGTH Kgf.m/cm² = 5 (min)
HARDNESS BHN = 229 (max)

(d) MECHANICAL PROPERTIES : (AS PER GOST 4543-71)

GRADE OF STEEL	TENSILE STRENGTH Kgf/mm ² (MIN)	YIELD POINT Kgf/mm ² (MIN)	ELONGATION % (MIN)	REDUCTION IN AREA % (MIN)	IMPACT STRENGTH Kgf.m/cm ² (MIN)
40X	100	80	10	45	6
45X	85	105	9	45	5



- ALTERNATE MATERIAL IN STEEL 40x, 45x, GOST 4543-71.
PIPE 16x4 GOST 9567-75
45b GOST 8733-74
- UNSPECIFIED LIMIT DEVIATIONS OF DIMENSIONS ARE AS FOLLOWS :-
FOR HOLES - AS PER A 7,
SHAFTS - AS PER B 7,
OTHERS - AS PER CM 7,
- OVALITY OF NOT MORE THAN 10 mm WITH A GREATER OVAL AXIS LOCATED WHERE THE HOLES ARE OVER LAPPED IS ALLOWED WHEN HOLE A IS DRILLED ON BOTH SIDES.
- INCREASE OF DIAMETER Δ OVER LENGTH $l = 10$ TO 15 mm IS PERMITTED UP TO $\phi 16.2$ mm.
- CUTTING MARKS ARE ALLOWED OVER LENGTH l DUE TO THE

- SINGLE-POINT TOOL REMOVAL
- CHAMFER IS ALLOWED ON HEXAHEDRAL HEAD ON THE SIDE OF THE ROD WITH DIMENSIONS, WHICH ARE SIMILAR TO THE DIMENSION OF CHAMFER ON THE HEAD OUTER SIDE.
 - PARTS MAY BE MADE OF SIZED BAR $\phi 16$ (4) AS PER GOST 7417-75 HEAD UPSETTING.
 - COATING - ZINC-PLATED, 9 MICRONS THICK, OILED. CHECK DIMENSIONS BEFORE COATING. ABSENCE OF ZINC ON THE INNER SURFACE AND THREAD SIZING ARE PERMITTED.
 - CLEAN AND WASH THE INTERNAL CAVITY.
 - * DIMENSIONS ARE GIVEN FOR REFERENCE.

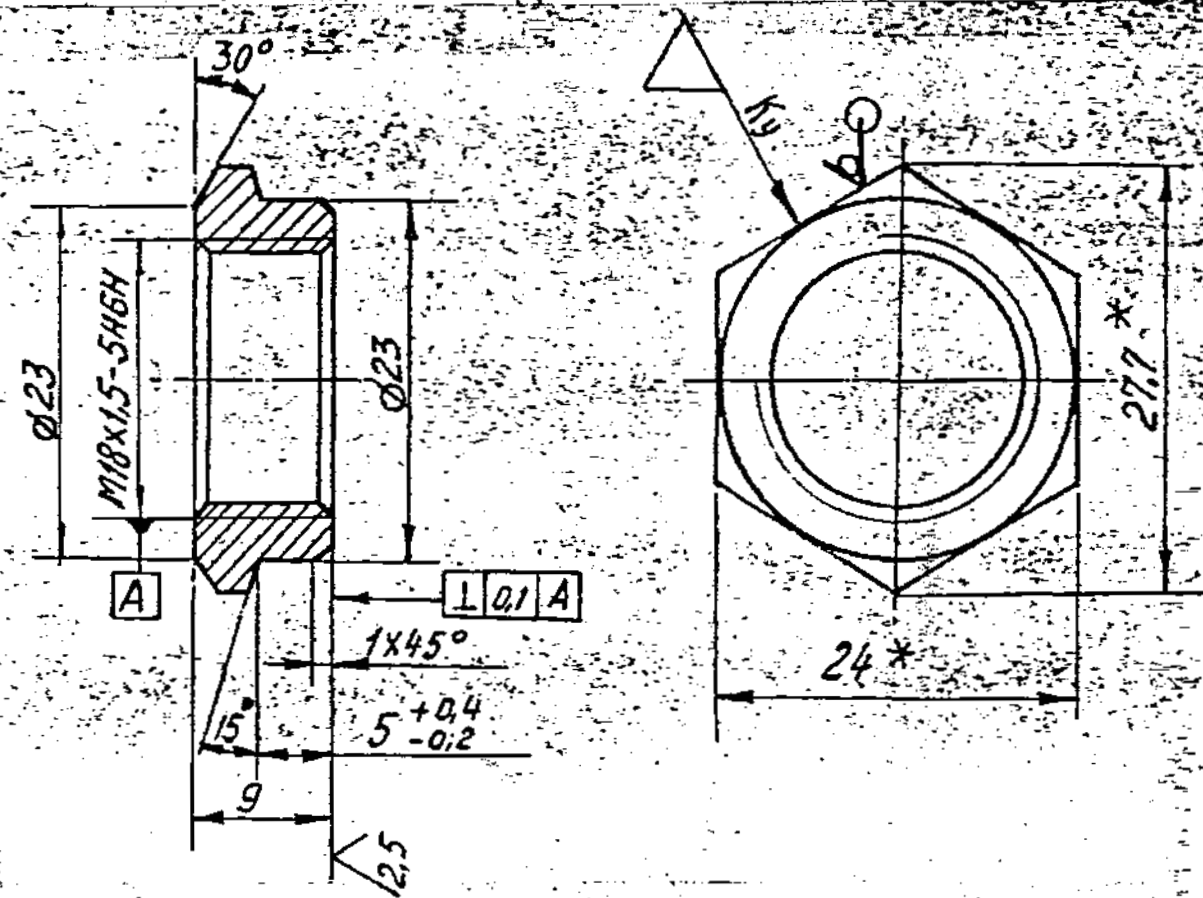
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. TO BE STAMPED OR MARKED WHERE INDICATED THIS # LETTERS)
0.136 kg
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT-SIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	Y. S. S.	MATERIAL	19 GOST 8560-78	USED ON :-	CD 20-23-01-8 to
CHD	S. S.		45 GOST 1050-74		CD 20-23-06...8
TCO	N. S.	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)			
APPD		A V A D I			
DATE	21-10-89	TITLE			
SCALE		CLAMPING UNION			
DIMENSIONS IN mm		TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 2102-69			
ISSUE		ALL THREADS TO CONFORM TO			
DATE		D S CAT NUMBER			
NATURE OF AMENDMENTS		DRAWING NUMBER			
		20-23-13-1			

DRAWING NUMBER
20-23-14

R240 (✓)



EXPLANATORY NOTE :

MATERIAL QUOTED : 24 GOST 8560-78
45 GOST 1050-74

BRIGHT STEEL HEXAGONAL BAR ACROSS FLATS 24 mm.

45 = GRADE OF STEEL.

(a) CHEMICAL COMPOSITION : (AS PER GOST 1050-74)

GRADE OF STEEL	CONTENT OF ELEMENTS %						
	C	Si	Mn	Cr	P	S	Cu Ni
45	0.42-	0.17-	0.50	0.25	0.04	0.035	0.25
	0.50	0.37	0.80				

MECHANICAL PROPERTIES :

TENSILE STRENGTH Kgf/mm² = 61 (min)
YIELD POINT Kgf/mm² = 36 (min)
ELONGATION % = 16 (min)
REDUCTION BY AREA % = 40 (min)

(A) EQUIVALENT MATERIAL STEEL
45C8 TO IS:1570

1. Alternate Material is Steel 30, 40, 50, GOST 1050-74.
2. Unspecified Limit Deviations of Dimensions are as follows:
For shafts - As per B7, For others - As per CM7.
3. Check Thread Dimensions Before Applying Coating.
4. Coating: Zinc-Plated, 3 Microns Thick, oiled.
- * 5. Dimensions are given for reference.

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION

EST. WT. TO BE STAMPED OR MARKED WHERE INDICATED THIS # (LETTERS)

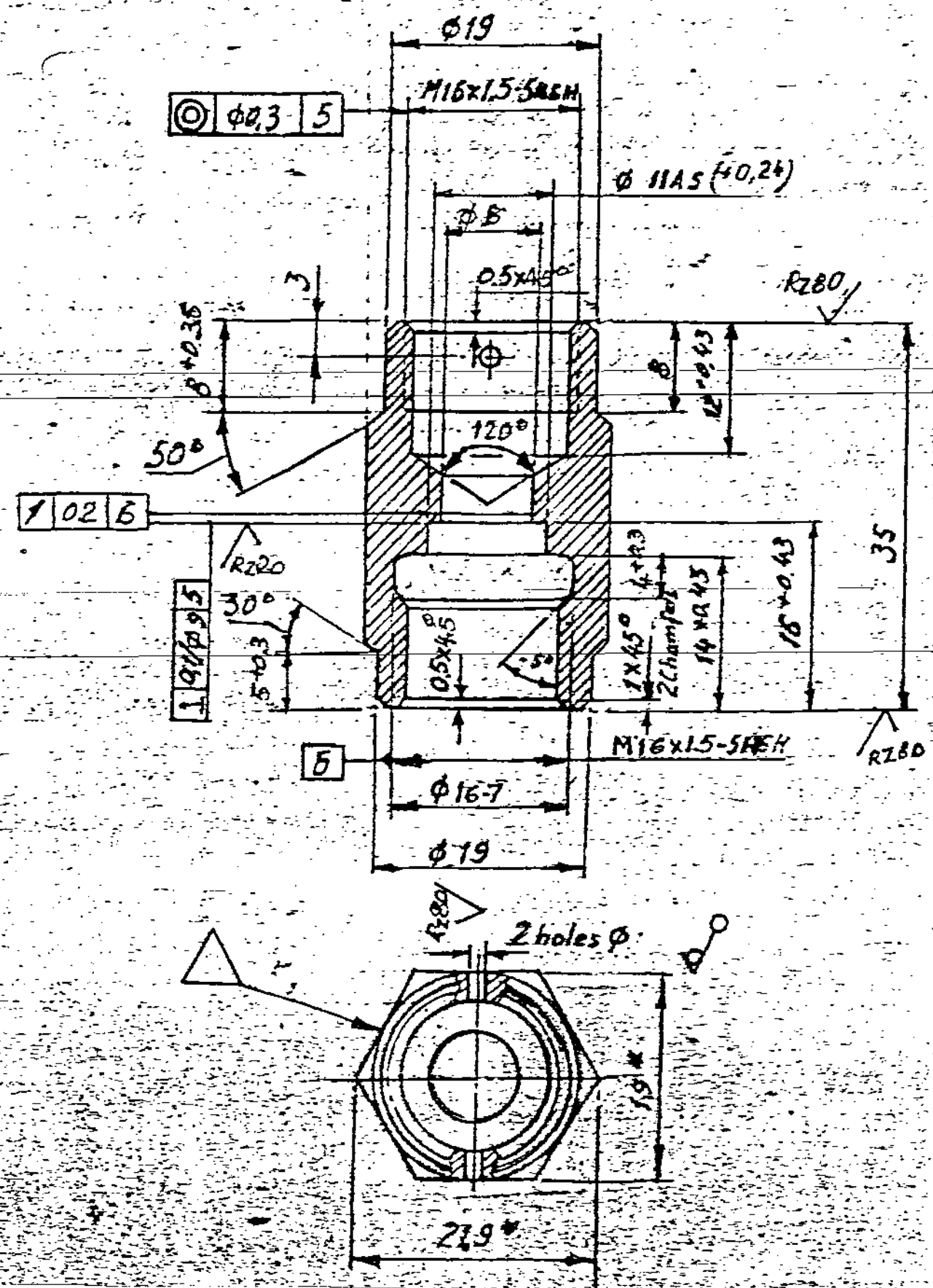
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUT SIDE INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRM	G. Vasilev	MATERIAL	24 GOST 8560-78	USED ON	CS 20-23-00-10
CHK	P. Ivanov		45 GOST 1050-74		
TCD	P. Ivanov				
APPD	V. Radoslav				
DATE	25-2-91	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)			
SCALE	2:1	AVADI			
		DIMENSIONS IN mm		TITLE	PRESSURE NUT
		TOLERANCE ON DIMNS			
		UNLESS OTHERWISE			
		STATED IS:2102-69			
		ALL THREADS TO		D S CAT NUMBER	DRAWING NUMBER
		CONFORM TO			20-23-14
ISSUE DATE	12-8-10	NATURE OF AMENDMENTS			
		4 th Alt. Comm. Meeting Minutes			
		Point No. 11 Dt: 26-10-09			

SIZE A3

DRAWING NUMBER
20-23-15-1

Rz 40 / (V)



EXPLANATORY NOTE:

MATERIAL QUOTED: 19 GOST 8560-78
45X GOST 4543-71

ALTERNATE MATERIAL QUOTED: 40X GOST 4543-71

BRIGHT STEEL HEXAGON ACROSS FLATS 19mm TO GOST 8560-78
45 X GRADE OF STEEL AND 40 X GRADE OF STEEL

CHEMICAL COMPOSITION

GRADE OF STEEL	CONTENT OF ELEMENTS %							
	C	Si	Mn	Cr	P	S	Cu	Ni
45X	0.41 - 0.49	0.17 - 0.37	0.50 - 0.80	0.80 - 1.10	MAXIMUM			
					0.035	0.035	0.30	0.30
40X	0.36 - 0.44	0.17 - 0.37	0.50 - 0.80	0.80 - 1.10	0.035	0.035	0.30	0.30

MECHANICAL PROPERTIES

	GRADES	
	45X	40X
YIELD POINT Kgf/mm ² (min)	85	80
ULTIMATE TENSILE STRENGTH Kgf/mm ² (min)	105	100
RELATIVE ELONGATION % (min)	9	10
RELATIVE REDUCTION ALONG CROSS SECTION (min)	45	45
IMPACT STRENGTH Kgf/cm ² (min)	5	6

- INSPECTION GROUP IV AS PER TECHNICAL-REQUIREMENTS TT-31 HRC 24 TO 30
- ALTERNATE MATERIAL IS STEEL 40X GOST 4543-71
- UNSPECIFIED LIMIT DEVIATION OF DIMENSION ARE AS FOLLOWS.
FOR HOLES = AS PER A7
FOR SHAFTS = AS PER B7
OTHERS = AS PER CM7
- HEXAGON MAY BE MACHINED UPTO DIAMETER OF 21mm.
- COATING ZINC PLATED 9 MICRONS THICK OILED.
THREAD CALIBRATION AND ABSENCE OF COATING ON THE INTERNAL SURFACES ARE PERMITTED
- DIMENSIONS ARE GIVEN FOR REFERENCE.

**
Cb 20-23-01-8
Cb 20-23-02-8
Cb 20-23-03-8
Cb 20-23-04-8
Cb 20-23-05-8
Cb 20-23-06-8

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. 0.05 kg
TO BE STAMPED OR MARKED WHERE INDICATED THIS * LETTERS)

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	G. N. S.	MATERIAL :-	19 GOST 8560-78	USED ON :-	** SEE ABOVE
CHD	G. N. S.		45X GOST 4543-71		
TCO	G. N. S.	CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)			
APPO		A V A D I			
DATE	23-9-89				
SCALE	2:1				
DIMENSIONS	IN mm				
TOLERANCE ON DIMS	UNLESS OTHERWISE STATED IS 202-69	TITLE UNION NUT			
ISSUE	19	D S CAT NUMBER	1464-81	DRAWING NUMBER	20-23-15-1
DATE		NATURE OF AMENDMENTS			

SIZE A2

1. PROVIDE DIMENSIONS WHOSE TOLERANCES ARE NOT SPECIFIED WITH AN ACCURACY OF $\pm 1\text{mm}$.
2. RADII OF PIPE BENDING SHOULD BE $30 \pm 3\text{mm}$. BENDING RADIUS ON THE SIDE OF TAPER I SHOULD BE $20 \pm 3\text{mm}$.
3. UPSET TAPERS AS PER DRAWINGS ASSY 20-23-01 TO 06-8, AFTER ASSEMBLY.
4. NORMALIZE ENDS AFTER UPSETTING OVER THE LENGTH OF 30 TO 35 mm.
5. CHECK THE PIPE WITH MAGNETIC FLAW DETECTOR OVER A LENGTH OF 100mm FROM EACH END AS PER INSTRUCTIONS, UB-20-17, AFTER UPSETTING IS CARRIED OUT.
6. DECREASE IN DIAMETER Δ , NOT EXCEEDING 0.2mm IS ALLOWED WHERE THE COLLET IS CLAMPED DURING TAPER UPSETTING.
7. SHARP CHANGE OF DIAMETERS Δ AND E TO A SMALLER DIAMETER AT PLACES, WHERE COLLET IS CLAMPED, IS NOT ALLOWED.
8. PIPE QUALITY AT THE BENDS SHOULD NOT EXCEED 0.7mm.
9. LAP TAPER B AND CHECK WITH GAUGE BY PRUSSIAN BLUE CLOSE-FIT ON STRIP Γ SHOULD BE 100%. CHECK TAPER B FOR PROPER FINISH AGAINST STANDARD.
10. TOTAL LENGTH OF THE PIPE WITH UPSET TAPERS SHOULD BE $580 \pm 20\text{mm}$. BEND PIPES IN ASSEMBLIES, ASSY 20-23-01 TO 06-8.

EXPLANATORY NOTE:-

MATERIAL QUOTED:- PIPE 7x2 BH-20A
TY 14-3-480-76

HIGH PRESSURE SEAMLESS PIPES OF STEEL GRADE 20A FOR FUEL EQUIPMENT OF DIESEL ENGINES.

7 mm = OUTER DIAMETER

2 BH = INNER DIAMETER = 2mm.

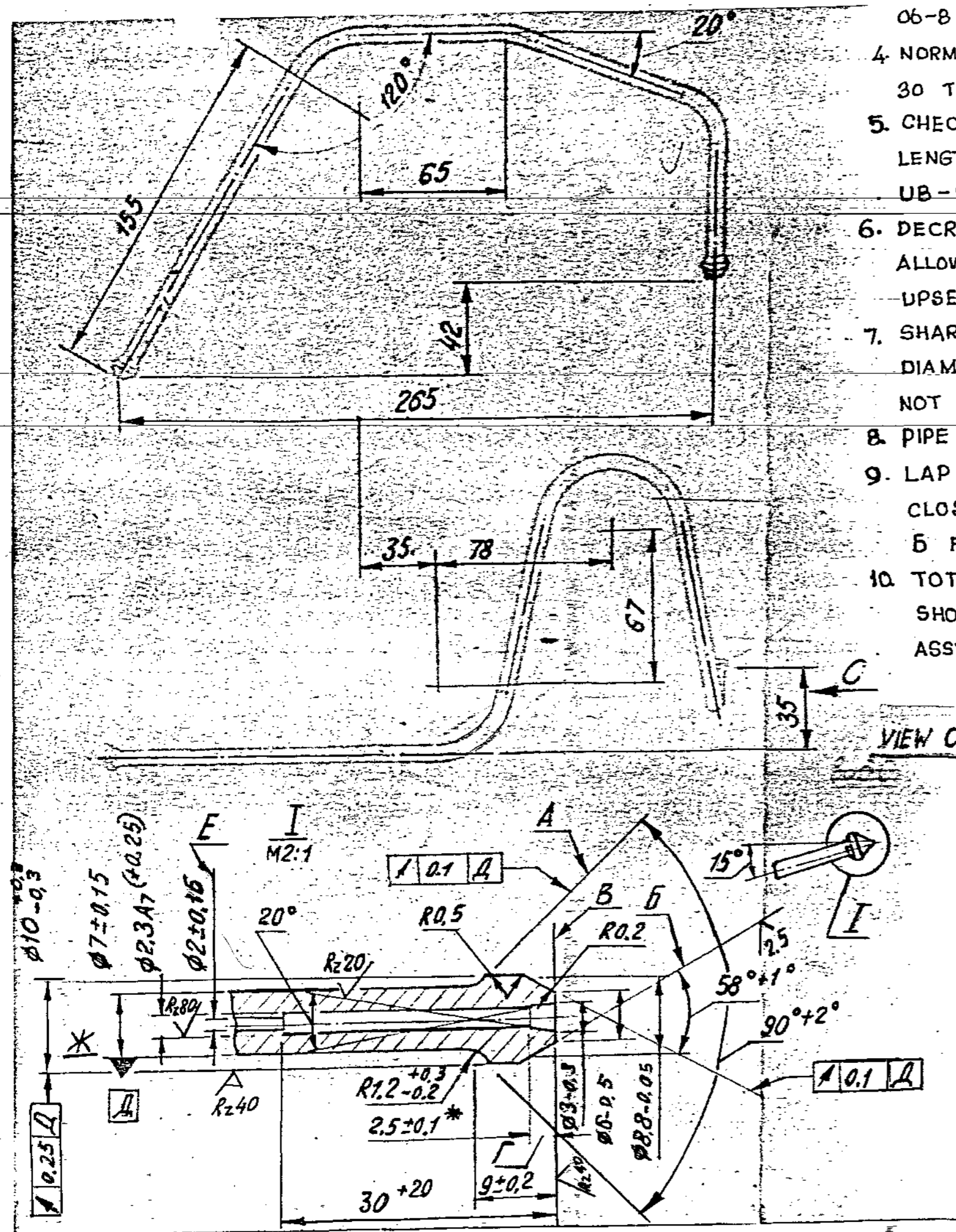
CHEMICAL COMPOSITION:- %

CONTENT OF ELEMENTS						
C	Si	Mn	Cr	Ni	S	P
MAXIMUM						
0.15 - 0.25	0.17 - 0.37	0.35 - 0.65	0.30	0.30	0.035	0.035

MECHANICAL PROPERTIES:

ULTIMATE RUPTURE STRENGTH — $\text{kgf/mm}^2 = 40(\text{min})$

RELATIVE ELONGATION % = 21 (MIN).



11. CHECK THE SHAPE AND CO-ORDINATES OF PIPES BENDING AGAINST TEMPLATE OR MOCK-UP IN ASSY 20-23-33-6 AND ASSY 20-23-34-5.
12. COATING:- ZINC PLATED, 15 MICRONS THICK, OILED.
13. PROTECT PIPE ENDS TO A LENGTH OF APPROXIMATELY 10mm FROM ZINC-PLATED, INTERNAL SURFACE MAY NOT BE PLATED.
14. REMOVE EXCESS ZINC AND FLASH DEVELOPED DUE TO COLLET CLAMPING OVER A LENGTH OF 20 TO 30mm FROM THE PIPE END AND POLISH THE SURFACE AGAINST STANDARD.
15. RECESS OF NOT IN EXCESS OF 1mm IN DEPTH IS ALLOWED, ON THE PIPE INTERNAL SURFACES, WHERE TAPER UPSETTING WAS CARRIED OUT.
16. PLAY OF SURFACES OF TAPERS A AND B AND SURFACE * SHOULD BE MEASURED AT A DISTANCE OF NOT MORE THAN 40mm FROM BUTT END B UP TO THE PIPE-BEND.

ALT. MATL. :-
CDS TUBE, GRADE ST.45 TO SPECN,
DIN. 2391- NORMALISED CONDITION.

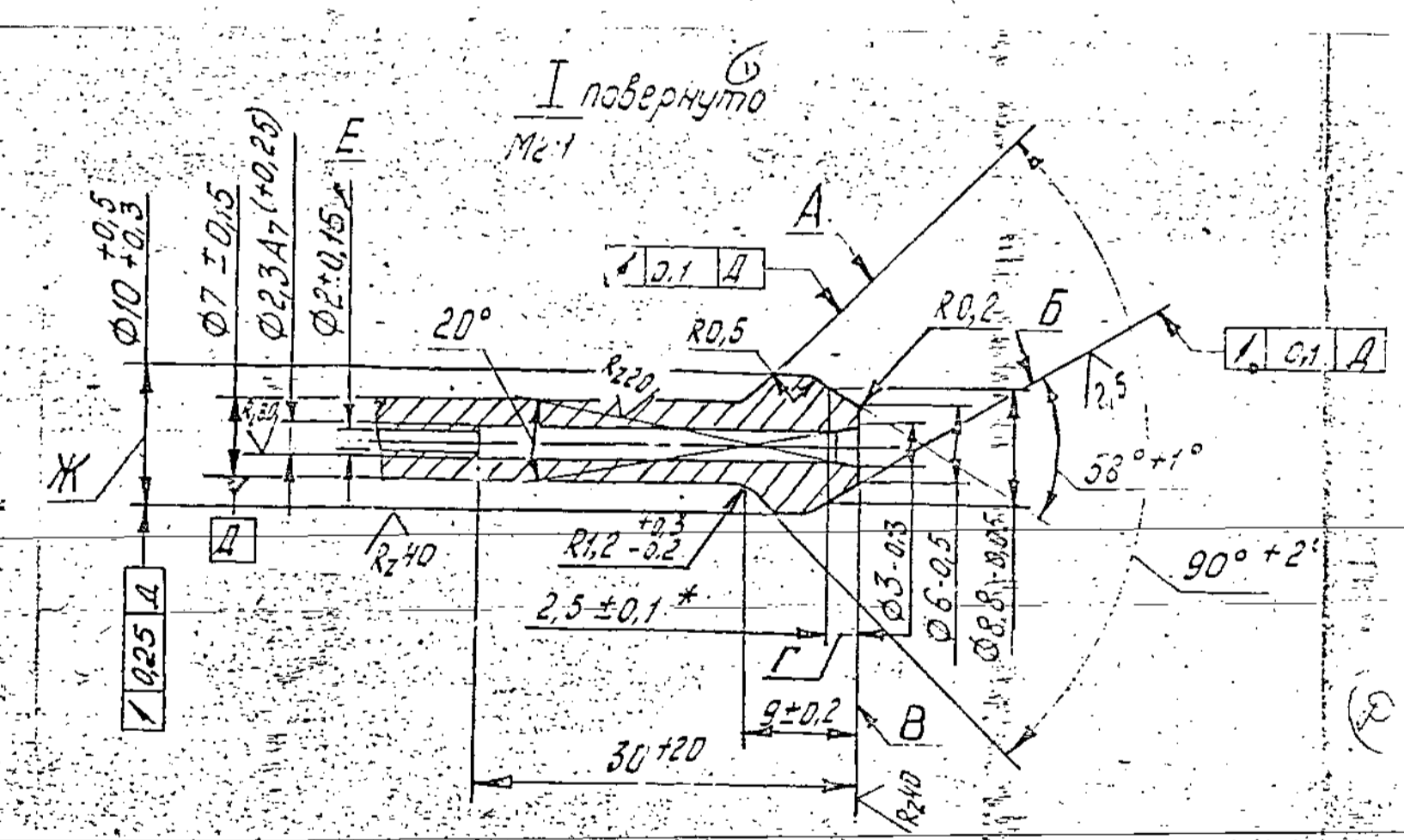
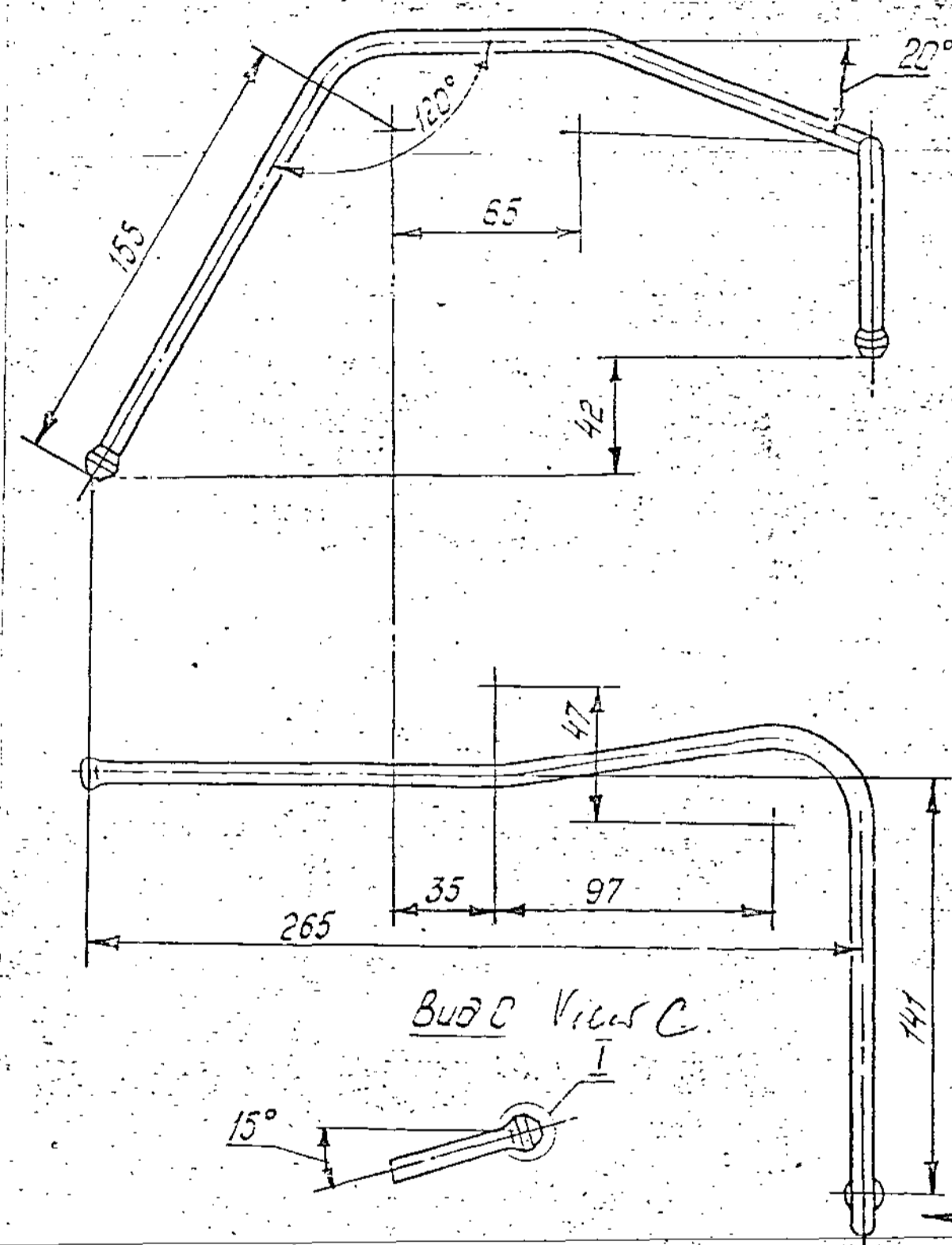
17. * DIMENSION IS GIVEN FOR REFERENCE.

PLOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. WT. 0.160 Kg
TO BE STAMPED OR MARKED WHERE INDICATED THUS # LETTERS!

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	CHD	TCD	APPD	DATE	SCALE	DIMENSIONS	TOLERANCE	ISSUE	DATE	NATURE OF AMENDMENTS	DRN	CHD	TCD	APPD	DATE	SCALE	DIMENSIONS	TOLERANCE	ISSUE	DATE	NATURE OF AMENDMENTS
				20-9-89	1:2	IN mm	UNLESS OTHERWISE STATED IS 2102-69	21	2-1-96	AUTHY. LT. 90241/AHSP/ENG. DT. 26-895											
MATERIAL :- PIPE 7x2BH - 20A TY 14-3-480-76											USED ON :- C6 20-23-01-8										
CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)											A V A D I										
TITLE LEFT HAND CYLINDER PIPE											D S CAT NUMBER										
DRAWING NUMBER 20-23-17-6																					



1. Machine dimensions whose tolerances are not specified with an accuracy of ± 1 mm.
2. Radius of the pipe bending should be 50 ± 3 mm. Bending radius on the side taper '1' should be 20 ± 3 mm.
3. upset tapers as per drawings assy. 20-23-01 to 06-8 after assembly.
4. Normalize ends after upsetting over the length of 30 to 35 mm.
5. Test the pipe on magnetic flaw detector over a length of ≈ 100 mm from each end as per instructions UB 20-17. After tapers up setting is carried out.
6. Decrease in diameter 'A' not exceeding 0.2mm. Allowed in places where collet is clamped
7. Sharp change of diameters 'A' and 'E' to smaller diameter is not allowed at places, where collet is clamped.
8. Pipe ovality by the beads should not exceed 0.7mm.
9. Lap taper 'B' and check with gauge by prussion blue. close-fit on strip should be 100%. check taper for proper finish against standard.

10. Total length of the pipe with upset tapers should be 530 ± 20 mm. Bend pipes in assy. 20-23-01 to 06-8.
11. check the shape and co-ordinates of pipe bending against template or mock-up in assy. 20-23-33-6 and assy. 20-23-34-5.
12. coating - zinc-plated 15 microns thick, oiled.
13. protect pipe ends to a length of ≈ 10 mm. From zinc plated internal surfaces may not be plated.
14. Remove excess zinc and flash developed due to collet clamping over a length of 20 to 30 mm from the pipe end and polish the surface against standard.
15. recess of 1mm in depth is allowed on the pipe internal surface, where taper upsetting was carried out.
16. play of surfaces A and B and surface * should be measured to a distance of no more than 40 mm from butt end B up to the pipe end.
- * dimension is given for reference
17. dimension is given for reference

EXPLANATORY NOTE:-

MATERIAL QUOTE: PIPE 7x2 BH-20A
HIGH PRESSURE SEAMLESS PIPES OF STEEL GRADE 20A FOR FULL EQUIPMENT OF DIESEL ENGINES.
7mm = OUTER DIAMETER
2 BH = INNER DIAMETER = 7mm.

CHEMICAL COMPOSITION:- %

C	CONTENT OF ELEMENTS					
	Si	Mn	Cr	Ni	S	P
0.15-0.25	0.11-0.37	0.25-0.65	0.30	0.30	0.035	0.035

MECHANICAL PROPERTIES:

ULTIMATE RUPTURE STRENGTH 40 kgf/mm² (MIN)
RELATIVE ELONGATION % = 21 (MIN)

(A) ALT. MATL. :- CDS TUBE, GRADE ST.45 TO SPECN. DIN.2391- NORMALISED CONDITION.

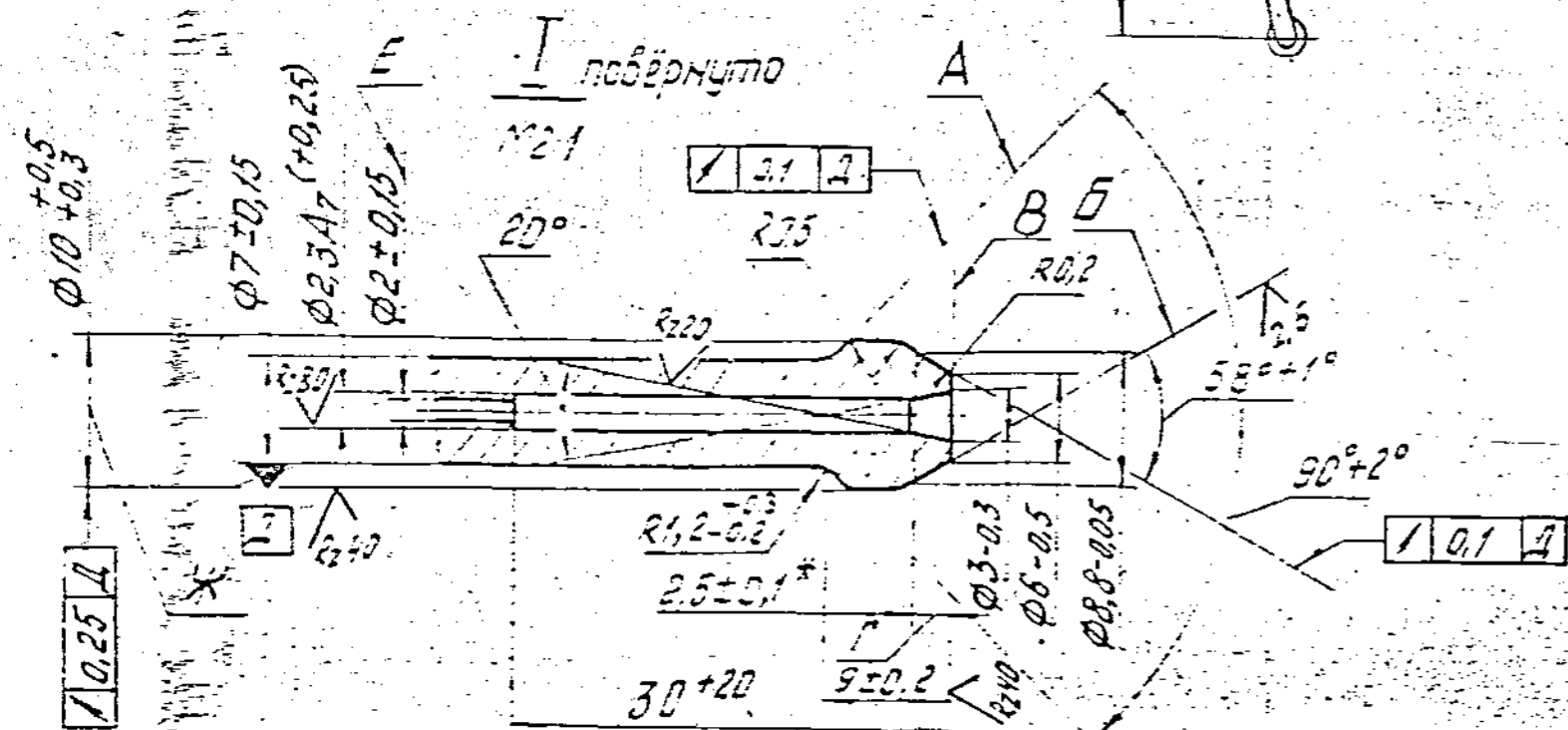
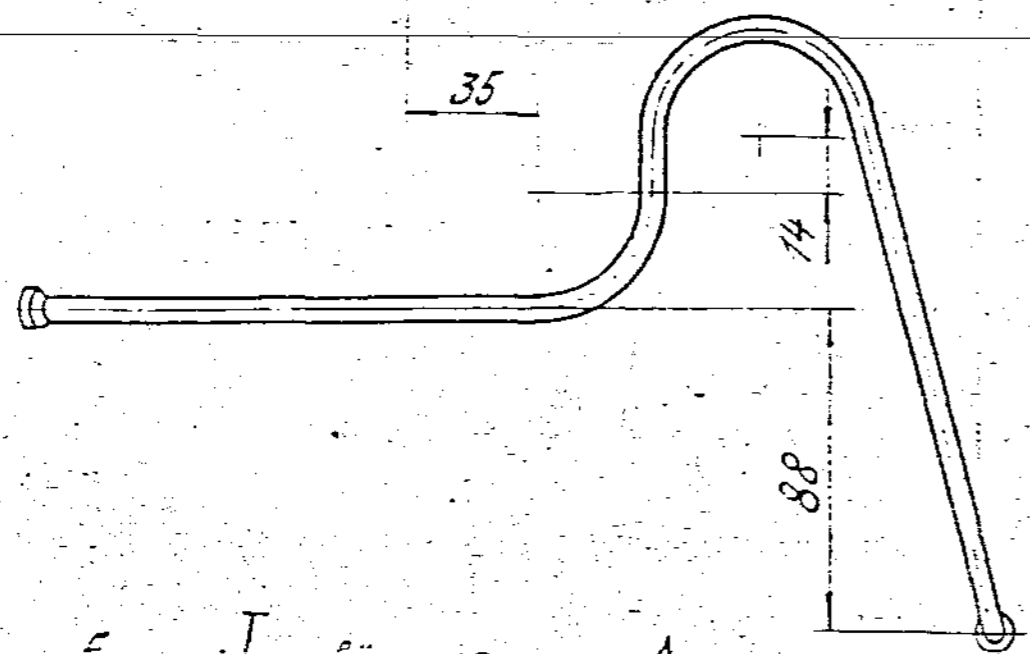
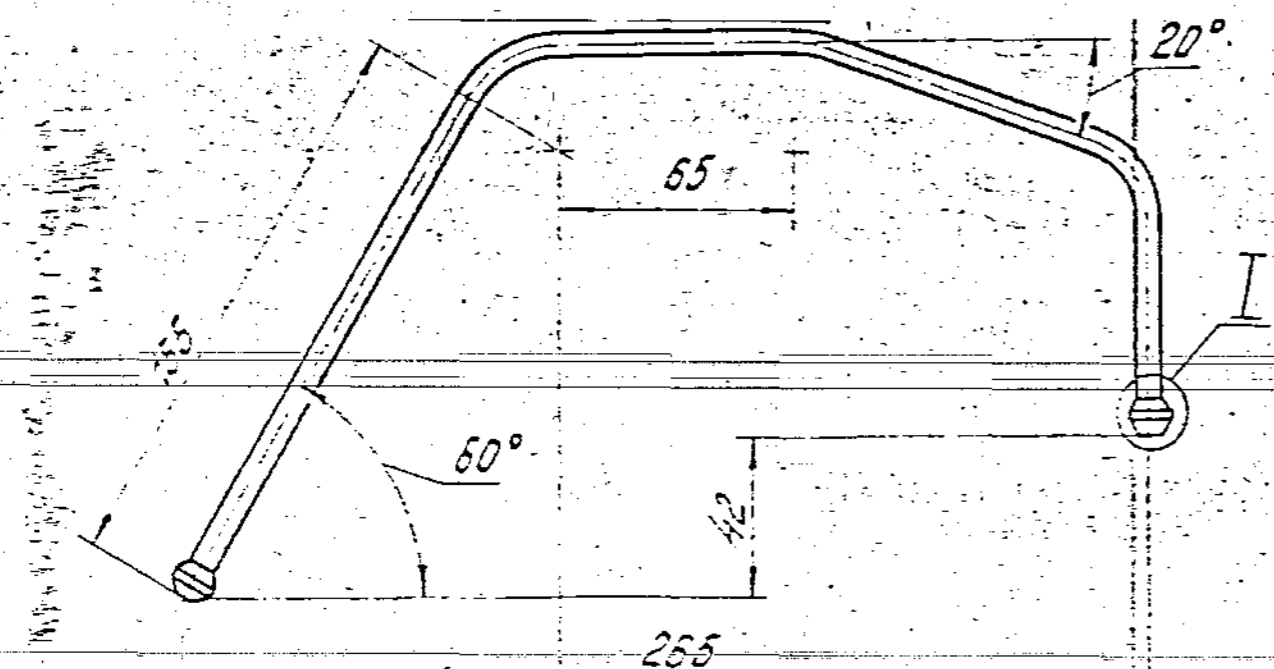
PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. MASS 0.160 Kg	TO BE STAMPED OR MARKED WHERE INDICATED THUS #
	(SEE TERS)
ALL SHARP EDGES AND CORNERS TO BE ROUNDED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	

DRN	DATE	MATERIAL :- PIPE 7x2 BH - 20A TY 4-3-480-76	USED ON 20-23-02-8
APPD	DATE	CONTROL RATE OF QUALITY ASSURANCE (HEAVY VEHICLES)	AVADI
SCALE - 1:2	DIMENSIONS IN mm.	TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102-49	TITLE 1st RH CYLINDER PIPE
ISSUE DATE	NATURE OF AMENDMENTS	ALL THREADS TO CONFORM TO	FIG S LAT NUMBER 20-23-20-6

DRAWING NUMBER

20-23-21-6



1. MACHINE DIMENSIONS WHOSE TOLERANCES ARE NOT SPECIFIED WITH AN ACCURACY OF $\pm 1mm$.
2. RADIUS OF THE PIPE BENDING SHOULD BE $30 \pm 2mm$. BENDING RADIUS ON THE SIDE TAPER I SHOULD BE $20 \pm 3mm$.
3. UPSET TAPERS AS PER DRAWINGS ASSY. 20-23-01 TO 06-8, AFTER ASSEMBLY.
4. NORMALIZE ENDS AFTER UPSETTING OVER THE LENGTH OF 30 TO 35mm.
5. TEST THE PIPE ON MAGNETIC FLAW DETECTOR OVER A LENGTH OF $\approx 100mm$ FROM EACH END AS PER INSTRUCTIONS UP 20-17 AFTER TAPERS UPSETTING IS CARRIED OUT.
6. DECREASE IN DIAMETER A NOT EXCEEDING 0.2mm ALLOWED IN PLACES WHERE COLLET IS CLAMPED.
7. SHARP CHANGE OF DIAMETERS A AND E TO SMALLER DIAMETER IS NOT ALLOWED AT PLACES WHERE COLLET IS CLAMPED.
8. PIPE OVALITY AT THE BENDS SHOULD NOT EXCEED 0.7mm.
9. LAP TAPER B AND CHECK WITH GAUGE BY PRUSSIN BLUE CLOSE-FIT ON STRIP SHOULD BE 100%. CHECK TAPER B FOR PROPER FINISH AGAINST STANDARD.

10. TOTAL LENGTH OF THE PIPE WITH UPSET TAPERS SHOULD BE $500 \pm 20mm$. BEND PIPES IN ASSY. 20-23-01 TO 06-8.
11. CHECK THE SHAPE AND COORDINATES OF PIPE BENDING AGAINST TEMPLATE OR MOCK-UP IN ASSY. 20-23-03.6 AND ASSY. 20-23-01-5.
12. COATING: ZINC-PLATED, 15 MICRONS THICK, OILED.
13. PROTECT PIPE ENDS TO A LENGTH OF $\approx 10mm$ FROM ZINC-PLATED. INTERNAL SURFACES MAY NOT BE PLATED.
14. REMOVE EXCESS ZINC AND FLASH DEVELOPED DUE TO COLLET CLAMPING OVER A LENGTH OF 20 TO 30mm FROM THE PIPE END AND POLISH THE SURFACE AGAINST STANDARD.
15. RECESS OF $1mm$ IN DEPTH IS ALLOWED ON THE PIPE INTERNAL SURFACES WHERE TAPER UPSETTING WAS CARRIED OUT.
16. PLAY OF SURFACES A AND E AND SURFACE K SHOULD BE MEASURED TO A DISTANCE OF NO MORE THAN 40mm FROM BUTT END B UP TO THE PIPE BEND.
17. DIMENSIONS ARE GIVEN FOR REFERENCE.

EXPLANATORY NOTE :-

MATERIAL QUOTED:- PIPE 7x2 BH-20A
TY 14-3-480-76

HIGH PRESSURE SEAMLESS PIPES OF STEEL GRADE

20A FOR FUEL EQUIPMENT OF DIESEL ENGINES.

7 mm = OUTER DIAMETER

2 BH = INNER DIAMETER = 2mm.

CHEMICAL COMPOSITION:- %

C	Si	Mn	CONTENT OF ELEMENTS			
			Cr	Ni	S	P
0.15 - 0.25	0.17 - 0.37	0.35 - 0.65	0.30	0.30	0.035	0.035
MAXIMUM						

MECHANICAL PROPERTIES:

ULTIMATE RUPTURE STRENGTH = 40 kgf/mm² (MIN)

RELATIVE ELONGATION % = 21 (MIN)

(A) ALT. MATL. :-
CDS TUBE, GRADE ST.45 TO SPECN.
DIN-2391- NORMALISED CONDITION.

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

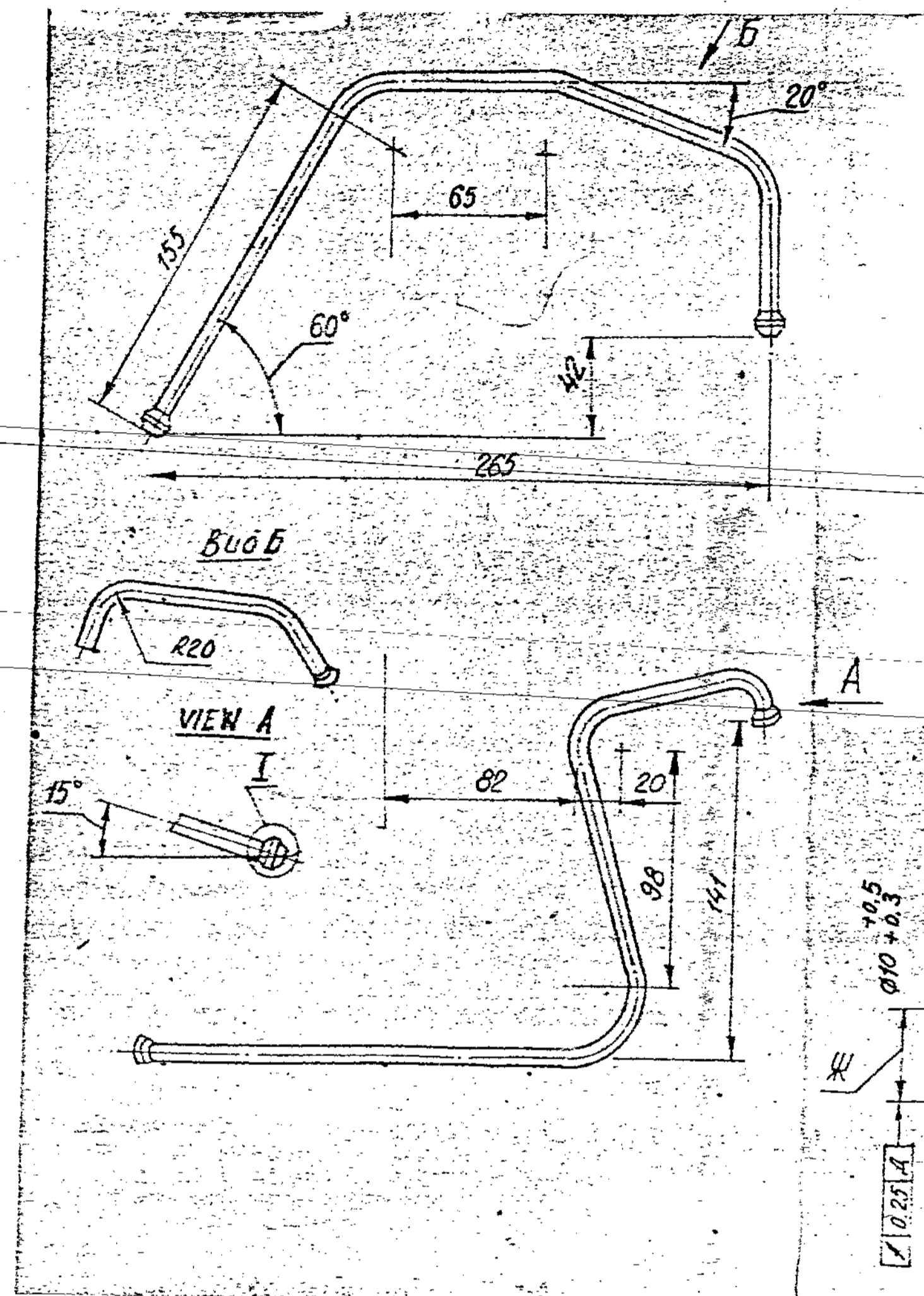
EST. WT. 0.160 kg
TO BE STAMPED OR MARKED WHERE INDICATED THIS # LETTERS

ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRM	4/10/68	MATERIAL	PIPE 7x2 BH-20A	USED ON :-
CHD	1/10/68			
TCO	9/10/68		TY 14-3-480-76	Cd 20-23-03-8
APPD		CONTROLLERATE OF QUALITY ASSURANCE (HEAVY VEHICLES)		
DATE	20-10-89	A V A D I		
SCALE = 1:2				
DIMENSIONS IN mm				
TOLERANCE ON DIMS UNLESS OTHERWISE STATED IS 2102-69				
ALL THREADS TO CONFORM TO			D S CAT NUMBER	DRAWING NUMBER
A	11-96	AUTHY. LT-90241/AHSP/ENG. DT. 26-8-75		20-23-21-6
ISSUE	DATE	NATURE OF AMENDMENTS		



SIZE 1:2



1. MACHINE DIMENSIONS WHOSE TOLERANCES ARE NOT SPECIFIED WITH AN ACCURACY OF ± 1 mm.
2. RADIUS OF THE PIPE BENDING SHOULD BE 30 ± 3 mm. BENDING RADIUS ON THE SIDE TAPER I SHOULD BE 20 ± 3 mm.
3. UPSET TAPER AS PER DRAWINGS ASSY. 20-23-01 TO 06-8 AFTER ASSEMBLY.
4. NORMALIZE ENDS AFTER UPSETTING OVER THE LENGTH OF 30 TO 35 mm.
5. TEST THE PIPE ON MAGNETIC FLAW DETECTOR OVER A LENGTH OF ≈ 100 mm FROM EACH END AS PER INSTRUCTIONS UB-20-17, AFTER TAPER UPSETTING IS CARRIED OUT.
6. DECREASE IN DIAMETER Δ NOT EXCEEDING 0.2 mm ALLOWED IN PLACES WHERE COLLET IS CLAMPED
7. SHARP CHANGE OF DIAMETERS Δ AND E TO A SMALLER DIAMETER IS NOT ALLOWED AT PLACES, WHERE COLLET IS CLAMPED.
8. PIPE OVALITY AT THE BENDS SHOULD NOT EXCEED 0.7 mm.
9. LAP TAPER B AND CHECK WITH GAUGE BY PRUSSIAN BLUE, CLOSE-FIT ON STRIP SHOULD 100% CHECK TAPER B FOR PROPER FINISH AGAINST STANDARD.
10. TOTAL LENGTH OF THE PIPE WITH UPSET TAPERS SHOULD 580 ± 20 mm BEND PIPE IN ASSY 20-23-01 TO 06-8.

11. CHECK THE SHAPE AND CO-ORDINATES OF PIPE BENDING AGAINST TEMPLATE OR MOCK-UP IN ASSY. 20-23-33-6 AND ASSY 20-23-34-5.
12. COATING: ZINC-PLATED, 15 MICRONS THICK, OILED
13. PROTECT PIPE ENDS TO A LENGTH OF ≈ 10 mm FROM ZINC-PLATED. INTERNAL SURFACES MAY NOT BE PLATED.
14. REMOVE EXCESS ZINC AND FLASH DEVELOPED DUE TO COLLET CLAMPING OVER A LENGTH OF 20 TO 30 mm FROM PIPE END AND POLISH THE SURFACE AGAINST STANDARD.
15. RECESS OF 3 mm IN DEPTH IS ALLOWED ON THE PIPE INTERNAL SURFACE, WHERE TAPER UPSETTING WAS CARRIED OUT.
16. PLAY OF SURFACES A AND B AND SURFACE X SHOULD BE MEASURED TO A DISTANCE OF NOT MORE THAN 40 mm FROM BUTT-END UP TO THE PIPE END.
17. * DIMENSION IS GIVEN FOR REFERENCE.

EXPLANATORY NOTE:

MATERIAL QUOTED:- PIPE 7x2 BH-20A
 TY 14-3-480-76
 HIGH PRESSURE SEAMLESS PIPES OF STEEL GRADE
 20A FOR FUEL EQUIPMENT OF DIESEL ENGINES.

7 mm = OUTER DIAMETER
 2 BH = INNER DIAMETER = 2mm.

CHEMICAL COMPOSITION:- %

CONTENT OF ELEMENTS						
C	Si	Mn	Cr	Ni	S	P
MAXIMUM						
0.15 - 0.25	0.17 - 0.37	0.35 - 0.65	0.30	0.30	0.035	0.035

MECHANICAL PROPERTIES:

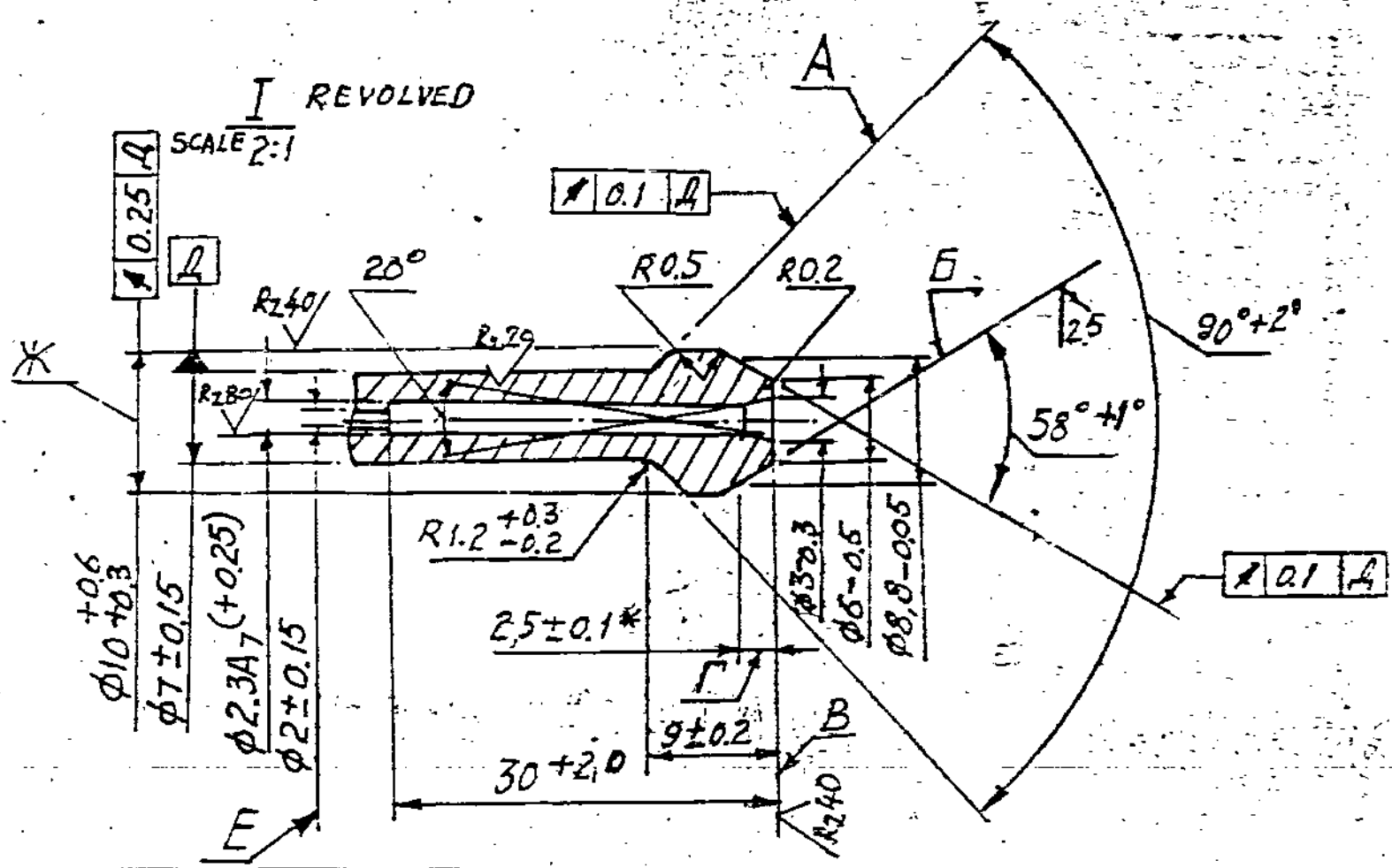
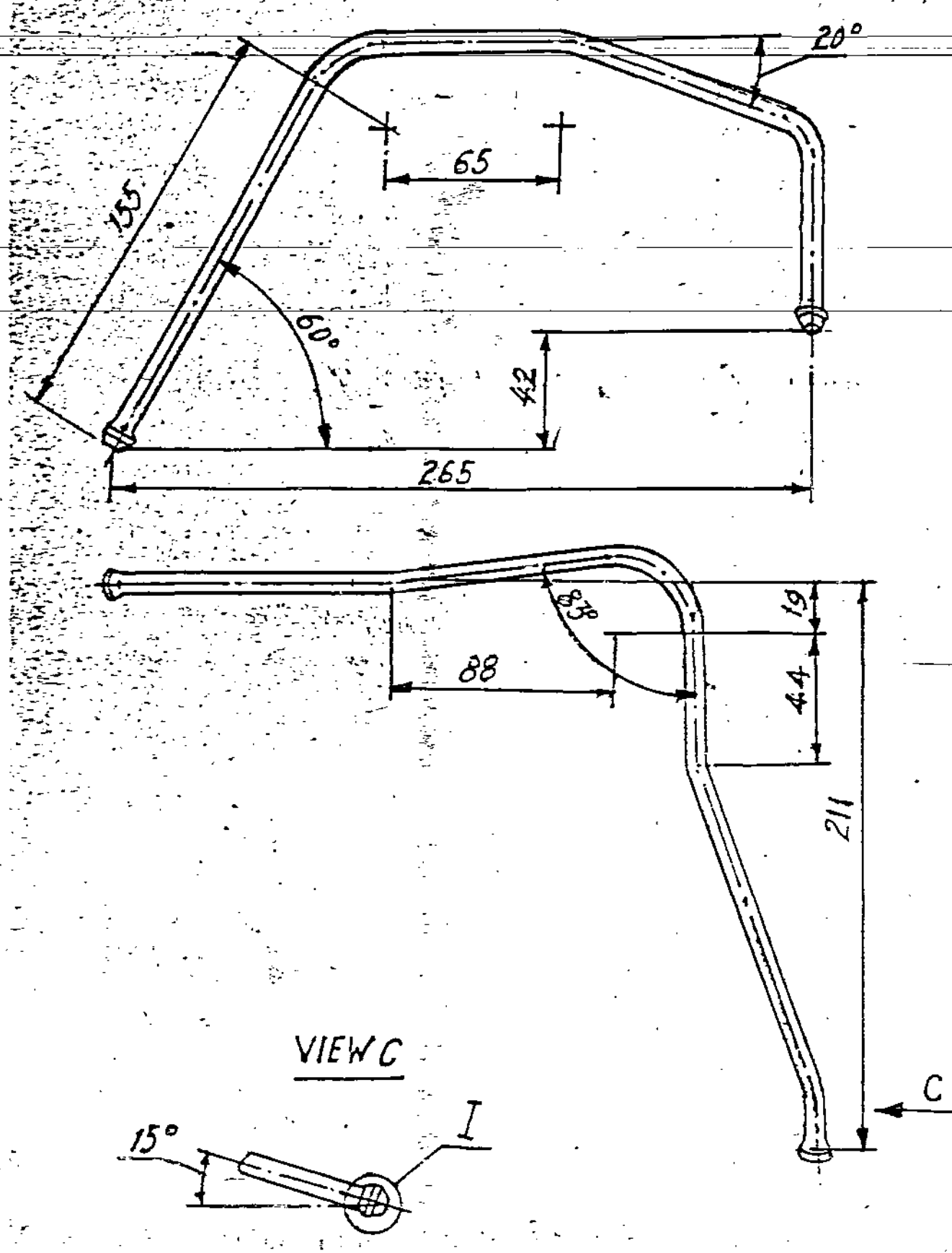
ULTIMATE RUPTURE STRENGTH - $Kgf/mm^2 = 40$ (min)
 RELATIVE ELONGATION % = 21 (min)

ALT. MATL. :-
 CDS TUBE, GRADE ST.45 TO SPECN.
 DIN.2391- NORMALISED CONDITION.

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. MASS	TO BE STAMPED OR MARKED WHERE INDICATED THUS #
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.	LETTERS

ISS	DATE	BY	FOR	MATERIAL	USED ON
21	14-6-81			PIPE 7x2 BH-20A TY 14-3-480-76	20-23-04-8
SCALE				CONTROLLER OF QUALITY ASSURANCE (HEAVY VEHICLES)	
DIMENSIONS IN mm				TITLE	
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2102-59				2 R.H. CYLINDER PIPE	
ALL THREADS TO CONFORM TO				D S CAT NUMBER	
ISSUE	DATE	NATURE OF AMENDMENTS	DRAWING NUMBER		
			20-23-22-6		



1. MACHINE DIMENSIONS WHOSE TOLERANCES ARE NOT SPECIFIED WITH AN ACCURACY OF ± 1mm.
2. RADIUS OF THE PIPE BENDING SHOULD BE 30±3mm BENDING RADIUS ON THE SIDE TAPER SHOULD BE 20±3mm.
3. UPSET TAPERS AS PER DRAWINGS ASSY. 20-23-01 TO 06-8, AFTER ASSEMBLY.
4. NORMALIZE ENDS AFTER UPSETTING OVER THE LENGTH OF 30 TO 35mm.
5. TEST THE PIPE ON MAGNETICFLAW DETECTOR OVER A LENGTH OF 100mm FROM EACH END AS PER INSTRUCTIONS UB 20-17, AFTER TAPERS UPSETTING IS CARRIED OUT.
6. DECREASE IN DIAMETER Δ , NOT EXCEEDING 0.2mm ALLOWED IN PLACES WHERE COLLET IS CLAMPED.
7. SHARP CHANGE OF DIAMETER S, Δ AND E TO A SMALLER DIAMETER IS NOT ALLOWED AT PLACES, WHERE COLLET IS CLAMPED.
8. PIPE OVALITY AT THE BENDS SHOULD NOT EXCEED 0.7mm.
9. LAP TAPER Δ AND CHECK WITH GAUGE BY PRUSSIAN BLUE, CLOSE FIT ON STRIP SHOULD BE 100%. CHECK TAPER Δ FOR PROPER FINISH AGAINST STANDARD.
10. TOTAL LENGTH OF THE PIPE WITH UPSET TAPERS SHOULD BE 580±20mm. BEND PIPES IN ASSY. 20-23-01 TO 06-8.
11. CHECK THE SHAPE AND CO-ORDINATES OF PIPE, BENDING AGAINST TEMPLATE OR MOCK-UP IN ASSY. 20-23-33-6 AND ASSY. 20-23-34-5.
12. COATING: ZINC-PLATED, 15 MICRONS THICK, OILED.
13. PROTECT PIPE ENDS TO A LENGTHS OF 10mm FROM ZINC-PLATED INTERNAL SURFACES MAY NOT BE PLATED.
14. REMOVE EXCESS ZINC AND FLASH DEVELOPED DUE TO COLLET CLAMPING OVER A LENGTH OF 20 TO 30mm FROM THE PIPE END AND POLISH THE SURFACE AGAINST STANDARD.
15. RECESS OF 1mm IN DEPTH IS ALLOWED ON THE PIPE INTERNAL SURFACE WHERE TAPER UPSETTING WAS CARRIED OUT.
16. PLAY OF SURFACES A AND B AND SURFACE * SHOULD BE MEASURED TO A DISTANCE OF NOT MORE THAN 40mm FROM BUTT END B UP TO THE PIPE BEND.
17. * DIMENSIONS ARE GIVEN FOR REFERENCE.

EXPLANATORY NOTE :-

MATERIAL QUOTED:- PIPE 7x2 BH-20A
TY 14-3-480-76
HIGH PRESSURE SEAMLESS PIPES OF STEEL GRADE
20A FOR FUEL EQUIPMENT OF DIESEL ENGINES.
7mm = OUTER DIAMETER
2 BH = INNER DIAMETER = 2mm.

CHEMICAL COMPOSITION:- %

C	CONTENT OF ELEMENTS					
	Si	Mn	Cr	Ni	S	P
0.15 - 0.25	0.17 - 0.37	0.35 - 0.65	0.30	0.30	0.035	0.035
MAXIMUM						

MECHANICAL PROPERTIES:

ULTIMATE RUPTURE STRENGTH = 40 kgf/mm² (MIN)
RELATIVE ELONGATION S, % = 21 (MIN)

ALT. MATL. :-
CDS TUBE, GRADE ST.45 TO SPECN.
DIN. 2391 - NORMALISED CONDITION.

PILOT SAMPLE SHOULD BE APPROVED BY A H S P BEFORE BULK PRODUCTION.

EST. MASS TO BE STAMPED OR MARKED WHERE INDICATED THUS # (LETTERS)
0.160 Kg.
ALL SHARP EDGES AND CORNERS TO BE REMOVED UNLESS OTHERWISE STATED MACHINED CORNERS TO HAVE R OUTSIDE R INSIDE EQUIVALENT CHAMFERS ARE PERMISSIBLE.

DRN	10/12	MATERIAL :- PIPE 7x2BH20A USED ON :-
END	14/11/69	TY 14-3-480-76
ISS	9/11/69	CB 20-23-05-B
APPR		CONTROL RATE OF QUALITY ASSURANCE (HEAVY VEHICLES)
DATE	16-10-69	AVADI
SCALE	1:2	
DIMENSIONS IN mm		TITLE
TOLERANCE ON DIMNS UNLESS OTHERWISE STATED IS 2'02-69		3LH CYLINDER PIPE
ALL THREADS TO CONFORM TO		D S CAT NUMBER
ISSUE DATE	2-1-96	DRAWING NUMBER
NATURE OF AMENDMENTS	AUTHY. L.T. No. 9024/AHSP/ENG. DT. 26-8-95	20-23-23-6

