फैक्स/Fax : 91-0522-458500
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK', Lucknow
टैलीफोन/Tele : 451200 (PBX)
450567 (DID)

सत्यमेव जयते

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India-Ministry of Railways
Research Design & Standards Organisation
Lucknow - 226011

No.EL/3. 2.5 Dated 24.11.2000

MODIFICATION SHEET NO. RDSO/ELRS/MS/ 0303-2000 (Rev. '0')

1. **TITLE**:

Adoption of modified oil pump on TAO659 traction motor having plain sleeve suspension bearings.

2. **OBJECT**:

Railways are reporting failure of plain sleeve suspension bearings of traction motor type TAO 659 due to :

1. Bearing seizure.
2. Failure of white metal lining.
3. Starvation of lubricating oil.
4. Due to bearing becoming abnormally hot for want of proper clearances.

The main reason of failure of plain sleeve suspension bearing is due to lack of lubrication which results in breakage of oil film in the suspension bearing.

The lubricating oil is required to be filled up during trip inspection at out station pits before scheduled inspection at homing Electric Loco Shed. Railways are sometimes finding it difficult to top up the lubricating oil before loco touches the shed for the normal inspection schedule and plain sleeve suspension bearings are prone to failure in such situation due to lack of lubrication.

To over come this problem, RDSO have issued SMI No. ELRS/SMI/0218-2000 (Rev-0) of 19-4-2000 on maintenance of felt seals and gaskets for avoiding the excessive suspension bearing oil consumption on these bearings which should be followed by Railways.

In addition, a break through has been made by developing a modified oil pump and by lowering the suction of the oil pump so that oil up to the lowest level is used from oil sump. This has resulted in increase in the oil topping up period from the present 15-20 days to 30-35 days. However, the filling of the sump is required to be monitored in view of various leakages. The modified oil pump has been tried at Electric Loco Shed, Tughlakabad, W,. Rly and the performance is reported to be satisfactory. Railway may either procure the new oil pump as per the modified drawing or the old oil pump can be modified by changing the internal modified parts in line with RDSO drawings. The following are the drawing references:

1. Oil pump to Drg No. SKEL-4569 (Alt-0)
2. Oil pump side plate & fixing plate to Drg No. SKEL-4570 (Alt-0)
3. Oil pump body to Drg No. SKEL-4571 (Alt-0)
4. Oil pump gear, pinion & woodruff key to Drg No. SKEL-4572 (Alt-0)
5. Oil pump extension & locking plate to Drg No. SKEL-4573 (Alt-0)

6. Oil pump screws & nut to DRG No. SKEL-4574 (Alt-0)

Railway may ensure provision of magnetic drain plug on the axle cap bottom oil sump as per old scheme before mounting of traction motors on bogie.

3. **WORK TO BE CARRIED OUT**:
   - Remove the existing oil pump assembly from the oil pump bracket.
   - Remove pinion and oil pump bucket.
   - Mount the modified oil pump along with existing pinion and oil pump bucket on the oil pump bracket.
   - Mount the whole above assembly on the axle cap and tighten its Hex Head screws size M 12x25 L along with M 12 spring washer as per usual process.
   - Fill up the suspension bearing oil of 20 lts in the bottom sump of axle cap of TAO 659 TM.

4. **APPLICATION**: All AC Electric locomotives fitted with TAO 659 traction motors having plain sleeve suspension bearings.

5. **MATERIAL REQUIRED**: Modified oil pump as per RDSO Drg No. SKEL-4569(Alt-0)

6. **MATERIAL RENDERED SURPLUS**: Existing oil pump/unmodified parts of oil pump.

7. **REFERENCE**: Discussion with Traction Motor manufacturers and Sheds to improve the performance of suspension bearings of traction motor type TAO 659.

8. **DRAWING**: RDSO Drawing No. SKEL-4569(Alt-0), SKEL-4570(Alt-0), SKEL-4571(Alt-0), SKEL-4572(Alt-0), SKEL-4573(Alt-0) & SKEL-4574(Alt-0)

9. **PERIODICITY OF IMPLEMENTATION**:
AOH/IOH/POH or whenever the traction motor fails due to suspension bearing defects like bearing seizure/hot/white metallic lining worked out etc.

10. **AGENCY OF IMPLEMENTATION**:
   - All Electric Loco Sheds.
   - All TM Workshops.
   - All traction motor manufacturers.

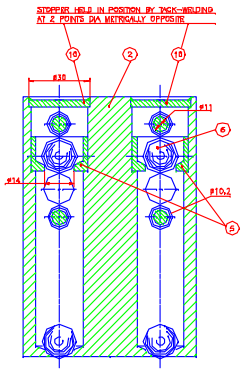
11. **DISTRIBUTION**: As per enclosed list.

Rajiv Kumar.

(R.K. Kulshrestha)
for Director General/Electrical

DA: RDSO' s Drawings as stated above.

SECTION–"D–D"



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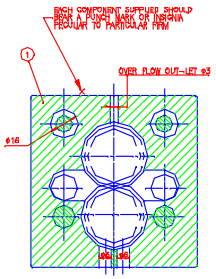

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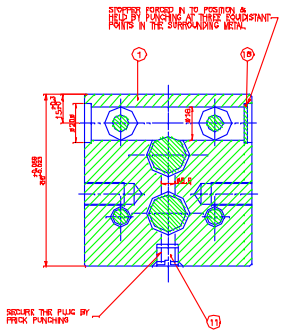

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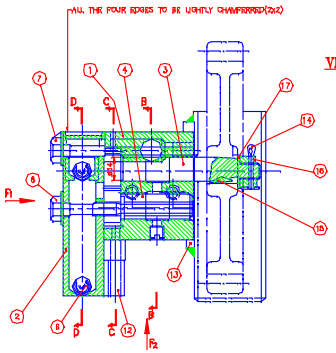
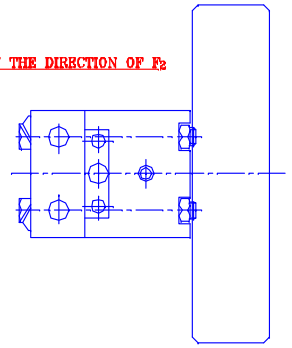
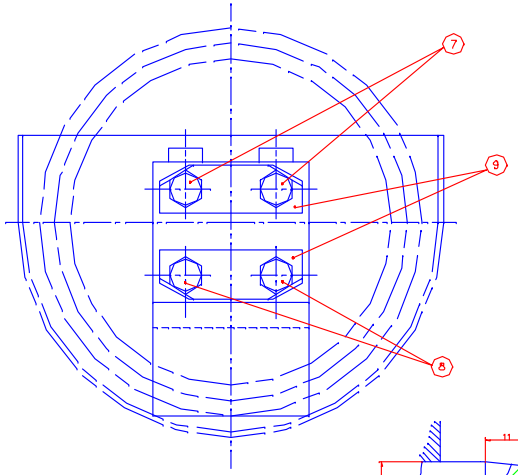
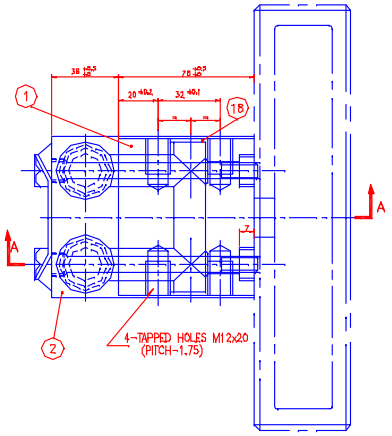


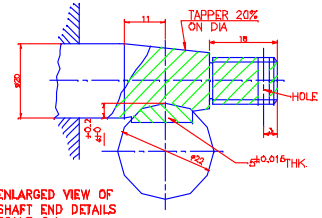
VIEW IN THE DIRECTION OF F_2



VIEW IN THE DIRECTION OF F_1







ENLARGED VIEW OF SHAFT END DETAILS SCALE–2:1

NOTES:–

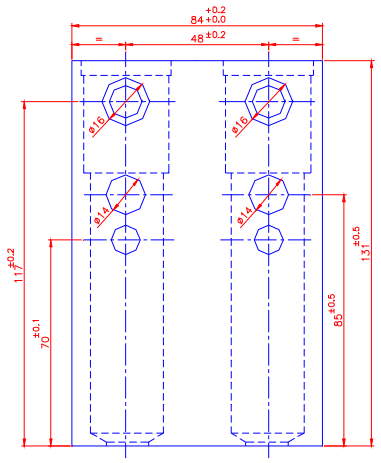
1. THE PUMP SHOULD BE PLACED IN THE VERTICAL POSITION SHOWN.
2. EFFECTIVE DISCHARGE FROM THE PUMP 3cm/REVOLUTION.
3. APPROXIMATE WEIGHT OF THE PUMP–4.8kg.

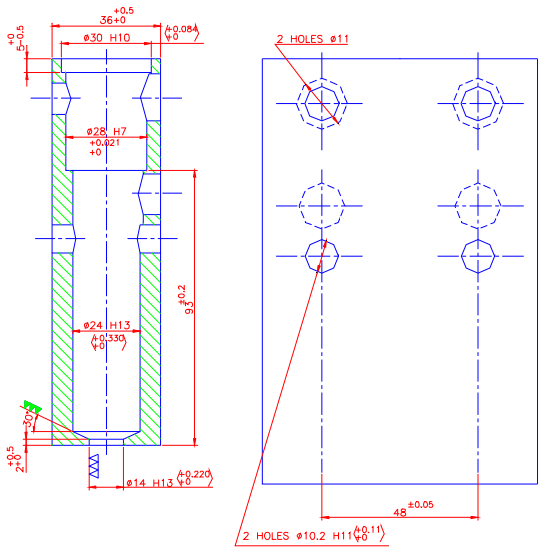
18		STOPPER		1 NOS.	STEEL.	IS : 1077/94 GR. : 426
17		LOCKING PLATE THK-1		1 NOS.	STEEL.	IS : 1077/94 GR. : 426
16		CASTLE NUT		1 NOS.	STEEL.	IS : 6369/69
15		WOOD RUFF KEY		1 NOS.	STEEL.	IS : 870 GR. : 8
14		SPLIT PIN		1 NOS.	STEEL.	IS : 2098/74 GR. : 426
13		FIXING PLATE		2 NOS.	STEEL.	IS : 2062/92 GR. : 400
12		EXTENSION PIECE		1 NOS.	BRASS	IS : 325/80
11		SCREWD PLUG M10		1 NOS.	STEEL.	IS : 2062/92 GR. : 426
10		STOPPER		2 NOS.	STEEL.	IS : 1077/94 GR. : 426
9		DOUBLE LOCKING PLATES (END PLATES)		2 NOS.	STEEL.	IS : 1077/94 GR. : 426
8		CENTERING SCREW M10x110LONG		2 NOS.	STEEL.	IS : 2062/92 GR. : 426
7		HEXAG SCREW M10x110LONG		2 NOS.	STEEL.	IS : 2062/92 GR. : 426
6		BALL. DIA18		4 NOS.	STEEL.	IS : 570 GR.–1.0 HARDENED&GROUND
5		BALL. SEAT		2 NOS.	STEEL.	IS : 2062/92 GR. : 426
4		PINION		1 NOS.	ALLOY STEEL	IS : 1570/61 GR. M 4 C–1
3		GEAR		1 NOS.	ALLOY STEEL	IS : 1570/61 GR. M 4 C–1
2		SIDE PLATE		1 NOS.	STEEL.	IS : 2062/92 GR. : 426
1		PUMP BODY		1 NOS.	BRASS	IS : 325/80 ALLOY–3
–		OIL PUMP		1 NOS.	–	–
REF.NO.	PART NO.	DESCRIPTION	DETAIL DRG. NO.	NO/LOCO	MATL.	SPEC.

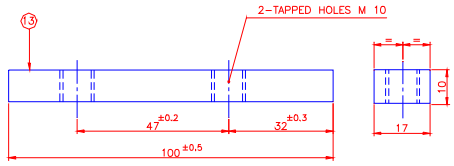
REF.		SCALE		APPD. BY	24.11.2K
TM TYPE TAO 659 OIL PUMP				FIRST ISSUED	
				SUPERSEDES	
RDSO.ELEC.DTE.		SKRL–4569 (ALT–'0')		SUPERSEDED BY	

STATUS	ALT.	REF.No.	DESCRIPTION	APPD.BY	DATE

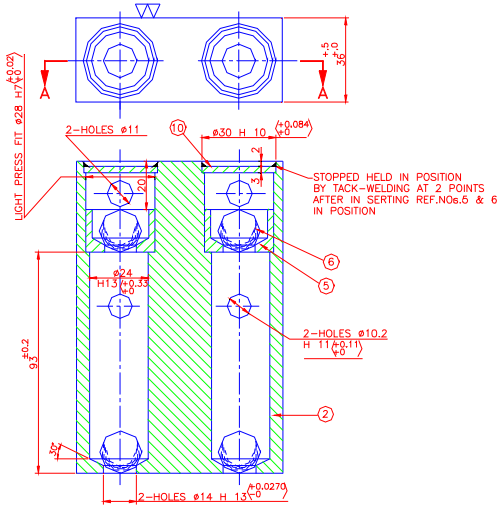
Dt.	17.11.2K
D	J.S.SHYAM
C	
T	



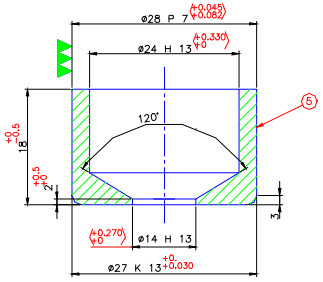


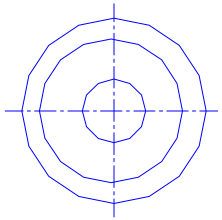


FIXING PLATE



SECTION – AA





NOTE:–

1. REMOVE ALL SHARP CORNES.
2. ALL DIMENSION ARE IN mm.
3. ALL HOLES ARE LIGHTLY CHAMFERED AT ENDS.

REF. NO.	PART NO.	DISCCRIPTION	DETAIL DRG.NO.	NO. LOCO	MATL.	SPEC.
13.		FIXING PLATES	SHEET	2	STEEL	IS : 2062'92
10.		STOPPER ø30x3 THK.	SHEET	2	STEEL	IS : 1079'94 ST : 425
6.		BALL ø18	SHEET	4	STEEL	BS : 970 En : 18
5.		BALL SEAT	SHEET	2	STEEL	IS : 2062'92 ST : 425
2.		SIDE PLATE	SHEET	1	STEEL	IS : 2062'92 ST : 425

REF:–

SCALE: 1:1

APPROVED BY: 24/11/2K

TM TYPE TAO 659
OIL PUMP SIDE PLATE AND FIXING PLATE

FIRST ISSUED

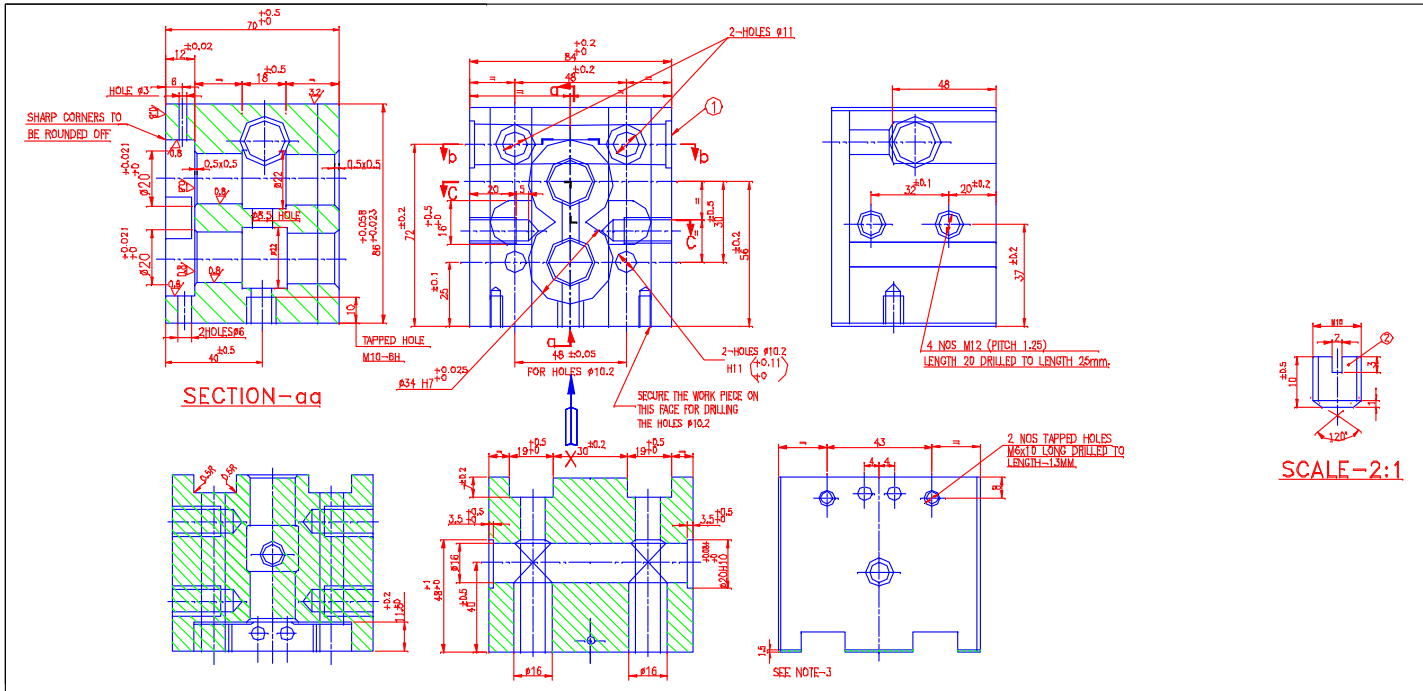
SUPERSEDED –

RDSO. ELECT. DTE. SKEL 4570,ALT'O'

SUPERSEDED BY –

Dt.	7.11.2K
D	C.S.SHYAM
C	
FILE No.	

STATUS	ALT.	REF.NO.	DESCRIPTION	APPROVED BY	DATE



NOTE:–

1. THE MATERIAL FOR THE PUMP BODY REF. 1 SHALL BE FORGED BRASS BLOCK TO IS:320 ALLOY 3.
2. MACHINING ALL OVER EXCEPT WHERE SPECIFICALLY INDICATED– $\sqrt{}$
3. 1.5mm EXTRA MATERIAL THAN THE SPECIFIED DIMENSION OF 70 $^{+0.5}_{+0}$ AS SHOWN BY HATCHED LINE SHOULD BE KEPT ON EACH PUMP BODY SO AS TO ENABLE RLYS/TM MANUFACTURERS TO TAKE MACHINING CHIPS FOR COMPOSITION ANALYSIS OF MATERIAL AT RANDOM.

REF. NO.	PART NO.	DISCCRIPTION	DETAIL DRG.NO.	NO. LOCO	MATL.	SPEC.
2.		SCREWED PLUG		1	STEEL	IS : 2062'92 ST : 42 S
1.		PUMP BODY		1		SEE NOTE

REF:– SCALE: 1:1 APPD. BY 24/11/2K

TM TYPE TAO 659
OIL PUMP BODY

FIRST ISSUED

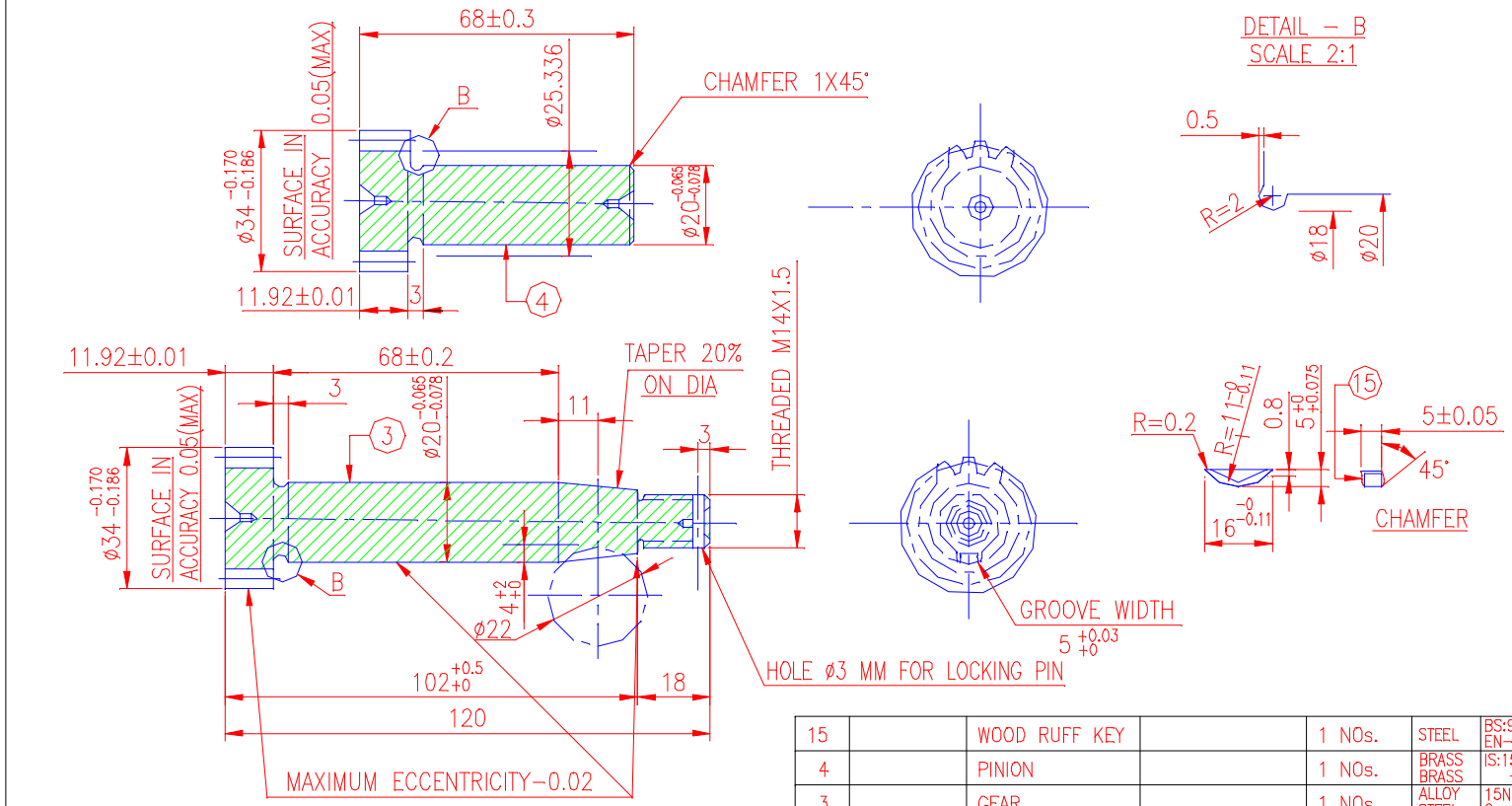
SUPERSEDED –

SUPERSEDED BY –

RDSO. ELECT. DTE. SKEL 4571,ALT'0'

Dt	7.11.2K
D	C.S.SHYAM
C	
FILE No.	

STATUS	ALT.	REF.NO.	DESCRIPTION	APPROVED BY	DATE



REF. NO.	PART NO.	DESCRIPTION	DETAIL DRG.NO.	NO/LOCO	MATL.	SPEC.
15		WOOD RUFF KEY		1 NOs.	STEEL	BS:970 EN–8
4		PINION		1 NOs.	BRASS BRASS	IS:1570 –61
3		GEAR		1 NOs.	ALLOY STEEL	15Ni4 Cr–1

REF. :

SCALE: 1:1

APPD. BY Roger Kumar

NOTE :– FOR REF. NO 3 & 4

1. NO OF TEETH = 15
2. P.C.D. = 30
3. MODULE = 2 PR ANGLE = 20°
4. ~~so~~ GROUND ALL OVER
5. ALL DIMENSIONS ARE IN MM
6. REF. 3 & 4 ARE CASE HARDENED AND QUENCHED REMOVE ALL SHARP EDGES & CORNERS

TM TYPE TAO–659
OIL PUMP
GEAR,PINION AND WOOD RUFF KEY

RDSO. ELECT. DTE

SKEL–4572 (ALT–0)

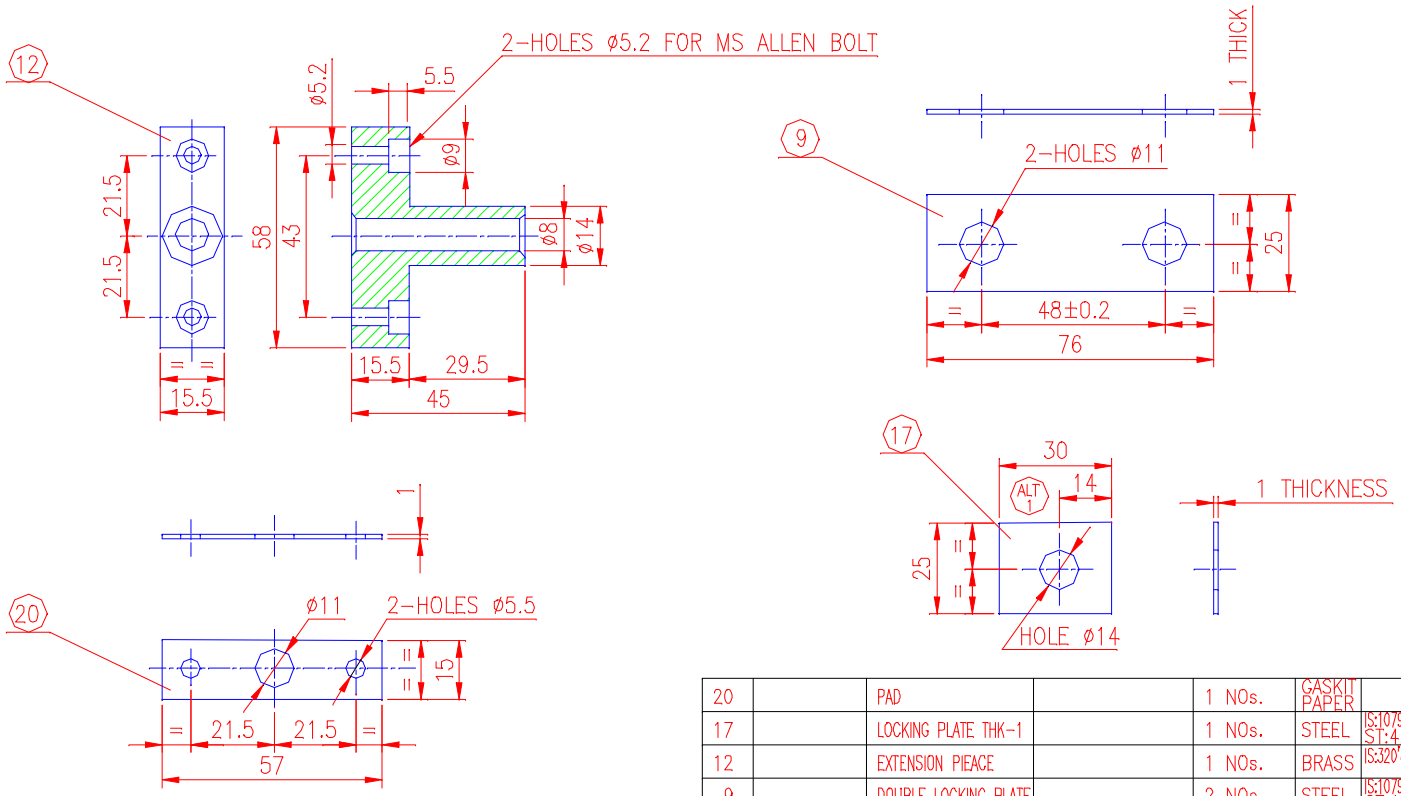
FIRST ISSUED

SUPERSEDES

SUPERSEDED BY

STATUS	ALT.	REF. NO.	DESCRIPTION	APPD. BY	DATE

Dt.	7.11.2000
DRN	C.S.SHYAM
CHD	
FILE	EL/3.2.115



REF. NO.	PART NO.	DESCRIPTION	DETAIL DRG.NO.	NO/LOCO	MATL.	SPEC.
20		PAD		1 NOs.	GASKIT PAPER	
17		LOCKING PLATE THK-1		1 NOs.	STEEL	IS:1079'94 ST:425
12		EXTENSION PIEACE		1 NOs.	BRASS	IS:320'80
9		DOUBLE LOCKING PLATE		2 NOs.	STEEL	IS:1079'94 ST:425

REF. :

SCALE: 1:1

APPD. BY Rajan Kumar 24/11/2K

TM TYPE TAO-659
OIL PUMP
EXTENTION AND LOCKING PLATES

FIRST ISSUED

SUPERSEDES

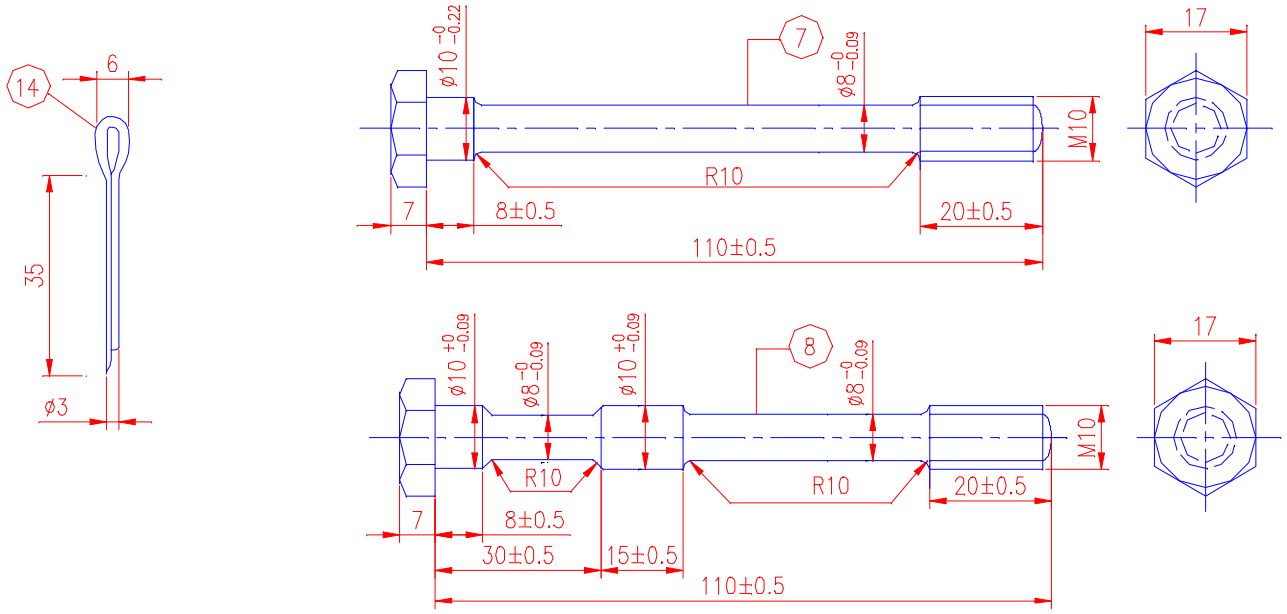
SUPERSEDED BY

RDSO. ELECT. DTE

SKEL-4573 (ALT-0)

Dt.	27.9.98
DRN	--
CHD	Mahant
FILE	EL/3.2.115

STATUS	ALT.	REF. NO.	DESCRIPTION	APPD. BY	DATE



REF. NO.	PART NO.	DESCRIPTION	DETAIL DRG.NO.	NO/LOCO	MATL.	SPEC.
14		COTTER PIN ø3 MM		1	STEEL	IS:2062'92
16		HEX. CASTLE NUT M14X1.5		1	STEEL	IS:2062'92
8		CENTERING SCREW M10X110		2	STEEL	IS:2062'92
7		HEX. SCREW M10X110		2	STEEL	IS:2062'92

REF. :

SCALE: 1:1

APPD. BY Rajan Kumar 24/11/2K

TM TYPE TAO-659
OIL PUMP
SCREWS AND NUT

FIRST ISSUED

SUPERSEDES

SUPERSEDED BY

RDSO. ELECT. DTE

SKEL-4574 (ALT-0)

Dt.	7.11.2000
DRN	C.S.SHYAM
CHD	
FILE	EL/3.2.115

STATUS	ALT.	REF. NO.	DESCRIPTION	APPD. BY	DATE