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FUNDAMENTAL MANUFACTURING PROCESSES

Sheet Metal Coil Processing

SCENE 1.
CG: FBI warning
white text centered on black to blue gradient

WARNING

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SCENE 2.
CG: disclaimer
white text centered on black to blue gradient

Always read the operating manual and safety information provided by the manufacturer before operating any sheet metal coil processing equipment.

Make sure all machine guards are in place, and follow all safety procedures when working with or near sheet metal coil processing equipment.

SCENE 3.
CG: AFFT screen A
white text centered on black to blue gradient
CP03A, tape 715, 01:01:10-01:01:50
GRAPHIC: AFFT logo

This program was produced using the technical resources of the Association for Forming & Fabricating Technologies of the Society of Manufacturing Engineers.

SCENE 4.
continue AFFT logo graphic
CG: AFFT screen B
white text centered on black to blue gradient

For more information on coil processing, please visit our website at:

www.sme.org/afft

SCENE 5.
CP05A, tape 40, 01:00:00-01:00:12
SME logo, with music
CG, SUPER: www.sme.org

SCENE 6.
CP06A, tape 25, 01:01:00-01:01:45
fundamental series open, with music
CP06B, peter carey narration

MUSIC UP AND UNDER

NARRATION (VO):

THE FUNDAMENTAL MANUFACTURING PROCESSES VIDEO SERIES, EXAMINING THE TOOLS AND TECHNIQUES OF

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PRECISION MANUFACTURING.

SCENE 7.
CG: Sheet Metal Coil Processing
white text centered on black

NARRATION (VO):

THIS PROGRAM EXPLORES THE FUNDAMENTALS OF SHEET METAL COIL PROCESSING.

SCENE 8.
CP08A, tape 800, 01:14:52-01:15:01
sheet metal rolled into hot coil, dissolve to next shot
CP08B, tape 800, 01:15:04-01:15:09
zoom out, hot coil fed to next set of rolls
CP08C, tape 800, 01:15:40-01:15:46
hot coil running through rollers
CP08D, tape 800, 01:15:48-01:15:58
sheet metal coil being coming out of rolling process
CP08E, tape 786, 04:02:10-04:02:16
sheet metal coil being transported
CP08F, tape 799, 18:20:03-18:20:21
zoom out, slitting operation

NARRATION (VO):

SHEET METAL STOCK IS PRODUCED AT A MILL BY PASSING METAL BILLETS THROUGH SUCCESSIVE SETS OF ROLLS UNTIL THE DESIRED THICKNESS IS ACHIEVED...,

THE RESULTING LONG, THIN STRIP OF METAL IS TYPICALLY ROLLED INTO COILED FORM FOR EASE OF HANDLING...,

TRANSPORT...,

AND FURTHER PROCESSING.

SCENE 9.
continue previous shot
CP09A, tape 787, 05:04:57-05:05:06
zoom out, sheet metal coil being rectangularity blanked
CP09B, tape 799, 18:05:13-18:05:22
sheet metal coil being blanked into irregular shape
CP09C, tape 272, 02:20:58-02:21:04
coil stock uncoiling, dissolve to next shot
CP09D, tape 272, 02:21:23-02:21:32
coiled sheet metal fed to stamping press
CP09E, tape 654, 05:24:28-05:24:36
zoom in, coil stock used in edge seaming assembly operation

NARRATION (VO):

COILED SHEET METAL IS PROCESSED IN ONE OF SEVERAL WAYS. IT CAN BE SLIT INTO SEVERAL COILS OF REDUCED WIDTH...,

OR BE SHEARED INTO RECTANGULAR...,

OR IRREGULARLY SHAPED BLANKS FOR FURTHER PROCESSING...,

COILED SHEET METAL ALSO CAN BE UNCOILED AND FED INTO A STAMPING PRESS...,

OR OTHER PROCESSING LINES, FOR PARTS PRODUCTION.

--- FADE TO BLACK ---

SCENE 10.
CG: Coil Slitting
white text centered on black

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SCENE 11.
CP11A, tape 794, 15:05:24-15:05:50
zoom out, thin processed coils
CP11B, peter carey narration

NARRATION (VO):

SLITTING IS A SHEARING PROCESS IN WHICH WIDE COILED STOCK IS SLIT INTO MULTIPLE NARROWER COILS.

SCENE 12.
continue previous shot
CP12A, tape 796, 17:02:57-17:03:22
zoom out, wide processed coil
CP12B, tape 794, 15:14:46-15:15:03
zoom out, slitting of foil stock
CP12C, tape 799, 18:16:38-18:16:45
zoom out, slitting of thick plate

NARRATION (VO):

THESE PROCESSED COILS RANGE IN WIDTHS FROM ONE QUARTER INCH, OR APPROXIMATELY SIX AND A HALF MILLIMETERS, TO NINETY SIX INCHES, OR APPROXIMATELY TWO AND A HALF METERS. WEIGHT OF THESE COILS RANGE FROM APPROXIMATELY ONE HUNDRED POUNDS, OR FORTY FIVE KILOGRAMS, TO ONE HUNDRED THOUSAND POUNDS, OR FORTY FIVE THOUSAND KILOGRAMS. ADDITIONALLY, A WIDE RANGE OF MATERIALS AND THICKNESSES CAN ALSO BE SLIT, INCLUDING THIN FOILS...,
AND THICK PLATE.

SCENE 13.
CP13A, tape 788, 06:02:13-06:02:21
zoom out, from slitting to recoiler
CP13B, tape 788, 06:21:42-06:21:47
zoom out, uncoiler reel
CG, SUPER: Uncoiler/Pay-Off Reel
CP13C, tape 788, 06:02:45-06:02:49
slitter
CG, SUPER: Slitter
CP13D, tape 787, 05:18:54-05:19:05
pan from tensioning device to recoiler
CG, SUPER: Tensioning Device
CG, SUPER: Recoiler

NARRATION (VO):

SLITTING IS ACCOMPLISHED USING A SLITTING LINE WHICH TYPICALLY CONSISTS OF AN UNCOILER, OR PAY-OFF REEL...,
A SLITTER...,
A TENSIONING DEVICE...,
AND A RECOILER.

--- TOUCH BLACK ---

SCENE 14.
CG, SUPER: Uncoiler Reel
CP14A, tape 788, 06:04:04-06:04:20
zoom out, uncoiler reel rotating, feeding stock, pan to slitter

NARRATION (VO):

THE UNCOILER REEL TIGHTLY GRIPS THE COIL MATERIAL ON ITS INSIDE DIAMETER USING AN

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EXPANDABLE MANDREL...,

THE COIL STOCK IS UNWOUND AND FED TO THE SLITTER

BY ROTATING, OR JOGGING, THE MANDREL.

SCENE 15.
CP15A, tape 789, 07:01:56-07:02:12
coils turning on turnstile
CP15B, tape 789, 07:03:08-07:03:17
coil loaded onto turnstile using coil car
CP15C, tape 797, 18:21:44-18:21:50
overhead crane picking up coil
CP15D, tape 788, 06:06:28-06:06:35
coil unloaded onto fork truck

NARRATION (VO):

SHEET METAL COIL STOCK IS HANDLED AND LOADED

ONTO THE UNCOILER REEL USING A VARIETY OF

DEVICES, INCLUDING:

TURNSTILES...,

COIL CARS...,

OVERHEAD CRANES...,

AND FORK TRUCKS.

--- TOUCH BLACK ---

SCENE 16.
CP16A, tape 792, 13:17:28-13:17:50
zoom out, slitting of coil
CG, SUPER: Slitter
CP16B, GRAPHIC: cutting knives set in a staggered sequence
CP16C, GRAPHIC: c.u. edges of two staggered knives
CP16D, GRAPHIC: c.u. edges of two staggered knives, with vertical line
CP16E, GRAPHIC: c.u. edges of two staggered knives with arrow showing vertical distance, or penetration
CG, SUPER: Penetration
CP16F, GRAPHIC: c.u. edges of two staggered knives with arrow showing horizontal distance, or knife clearance
CG, SUPER: Knife Clearance

NARRATION (VO):

THE SLITTER HOLDS TWO PARALLEL SHAFTS, OR

ARBORS, ONTO WHICH ROTARY CUTTING KNIVES ARE

MOUNTED. THE CUTTING KNIVES ARE SET IN A

STAGGERED SEQUENCE WITH THE UPPER AND LOWER SET

OFFSET SO THAT THE LEADING EDGES OF THE KNIVES

ARE ALIGNED VERTICALLY. THE VERTICAL DISTANCE

BETWEEN THE UPPER AND LOWER KNIVES IS KNOWN AS

'PENETRATION'. THE HORIZONTAL DISTANCE BETWEEN

THE UPPER AND LOWER KNIVES IS KNOWN AS 'KNIFE

CLEARANCE'.

SCENE 17.
CP17A, tape 788, 06:18:29-06:18:47
c.u., zoom out, slitting of coil

NARRATION (VO):

AS THE KNIVES CONTACT THE PASSING COIL STOCK,

THEY PARTIALLY PENETRATE THE MATERIAL. THIS

BUILDS OPPOSING FORCES IN THE COIL STOCK,

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CAUSING A CRACK OR FRACTURE ON BOTH SIDES OF THE COIL STOCK, SEPARATING THE MATERIAL.

SCENE 18.
CP18A, tape 799, 18:15:10-18:15:28
zoom in, slitting of thick coil

NARRATION (VO):

THE KNIVES TYPICALLY PENETRATE THE COIL STOCK NO MORE THAN ONE THIRD OF THE STOCK THICKNESS BEFORE SEPARATION OCCURS. THE EXACT AMOUNT OF PENETRATION AND KNIFE CLEARANCE VARIES DEPENDENT UPON THE MATERIAL TYPE AND HARDNESS.

SCENE 19.
CP19A, tape 788, 06:21:14-06:21:28
zoom out, slitting knives to side of slitter
CP19B, tape 799, 18:23:25-18:23:38
zoom out, spacers added to arbor

NARRATION (VO):

THE FORCE REQUIRED TO MAINTAIN THE TWO ARBORS PARALLEL, AND THUS MAINTAIN THE VERTICAL CLEARANCE OF THE ROTARY KNIVES, IS DIRECTED THROUGH THE END HOUSINGS OF THE MACHINE. HORIZONTAL KNIFE CLEARANCE IS ADJUSTED USING TOOL STEEL SPACERS AND SHIMS DURING TOOL SETUP.

SCENE 20.
CP20A, tape 799, 18:21:19-18:21:34
zoom in, both edges being trimmed to one edge being trimmed

NARRATION (VO):

NORMALLY, THE EDGE IS TRIMMED ON EACH SIDE OF THE COIL. THE TRIMMED EDGE IS A REGISTER CUT AND PROVIDES A REFERENCE POINT FROM WHICH THE OTHER CUTS CAN BE MADE.

--- TOUCH BLACK ---

SCENE 21.
CP21A, tape 788, 06:21:34-06:21:41
zoom out, master coil
CP21B, tape 787, 05:25:17-05:25:43
pan from slit coils, past tensioning device to recoiler
CG, SUPER: Tensioning Device

NARRATION (VO):

MOST MASTER COILS ARE CROWNED, THAT IS THE COIL STOCK IS THICKER IN THE CENTER, AND THINNER TOWARD THE EDGES. FOR THIS REASON, PROCESSED CENTER COIL STRIPS WIND TO A LARGER OUTER DIAMETER THAN THE END COIL STRIPS. THE RESULT IS

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THAT THE CENTER STRIPS TYPICALLY WRAP-UP MORE QUICKLY WHILE THE STRIPS TOWARD THE EDGES HANG DOWN LOOSE. A TENSIONING DEVICE IS GENERALLY EMPLOYED BETWEEN THE SLITTER AND RECOILER TO ADJUST FOR THIS LENGTH DIFFERENTIAL PROBLEM, THUS ALLOWING ALL THE STRIPS TO WRAP-UP TIGHTLY ON THE RECOILER.

SCENE 22.
CG, SUPER: Recoiler
CP22A, tape 787, 05:24:23-05:24:43
recoiler taking up processed coils, zoom in, slit coils separated using separator discs
CP22B, tape 787, 05:28:12-05:28:26
coils pushed onto auxiliary handling equipment

NARRATION (VO):

THE RECOILER TAKES UP THE PROCESSED COILS ON A DRIVEN EXPANDABLE MANDREL...,

THE SLIT COILS ARE KEPT SEPARATED BY SEPARATOR DISCS TO PREVENT INTERLEAVING...,

ONCE THE PROCESSED COILS ARE WOUND, THE MANDREL IS COLLAPSED, AND THE COILS ARE TRANSFERRED ONTO AUXILIARY HANDLING EQUIPMENT.

SCENE 23.
CP23A, tape 789, 07:08:10-07:08:21
zoom in, scrap disposal on slitting line
CP23B, tape 607, 15:04:51-15:04:57
zoom out, edge conditioning of coil
CP23C, tape 788, 06:15:10-06:15:15
packaging of slit coil

NARRATION (VO):

OTHER EQUIPMENT CAN ALSO BE ADDED TO A SLITTING LINE, INCLUDING:

A MEANS FOR SCRAP DISPOSAL...,

EDGE CONDITIONING...,

AND PACKAGING EQUIPMENT.

SCENE 24.
CP24A, tape 348, 00:03:34-00:03:43
zoom out, pull through slitting line
CG, SUPER: Pull Through
CP24B, tape 802, 19:02:28-19:02:34
pan, single-loop slitting line
CG, SUPER: Loop

NARRATION (VO):

THERE ARE TWO BASIC TYPES OF SLITTING LINES:

THE PULL THROUGH...,

AND THE LOOP.

SCENE 25.
CG, SUPER: Pull-Through Slitting
CG, SUPER: Tight-Line Slitting

NARRATION (VO):

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CP25A, tape 348, 00:05:02-00:05:09
pull through recoiler drive
CP25B, tape 348, 00:01:07-00:01:28
pan, zoom out, pull-through slitting line from coil unwinding to shear to rewind

IN PULL-THROUGH, OR TIGHT-LINE SLITTING, THE RECOILER DRIVE PROVIDES THE POWER TO PULL THE COIL STOCK OFF THE UNCOILER REEL...,
THROUGH THE SLITTER...,
AND RECOIL THE PROCESSED STRIPS.

SCENE 26.
CG, SUPER: Loop Slitting
CP26A, tape 792, 13:13:14-13:13:28
pan, slitter to coils in pit
CP26B, tape 792, 13:14:34-13:14:52
zoom out, slitter
CP26C, tape 793, 14:07:13-14:07:24
zoom out, recoiler

NARRATION (VO):

IN LOOP SLITTING, A PIT IS INCORPORATED INTO THE LINE. THE PROCESSED COIL STRIPS ARE LOOPED INTO THE PIT WHICH ASSISTS IN ABSORBING THE STRIP LENGTH DIFFERENTIAL WITHIN THE SLIT COILS. THE SLITTER TYPICALLY PROVIDES THE POWER TO BOTH UNCOIL...,
AND SLIT THE MATERIAL...,
WHILE THE RECOILER PROVIDES THE POWER TO REWIND THE MATERIAL.

--- FADE TO BLACK ---

SCENE 27.
CG: Coil Blanking
white text centered on black

SCENE 28.
CP28A, tape 293, 02:01:14-02:01:36
large sheet metal part produced using sheet stock
CP28B, tape 791, 10:07:54-10:08:04
zoom out, blanks with straight edges being produced
CP28C, tape 791, 10:06:55-10:07:01
blanks with angled edges being produced
CP28D, tape 799, 18:01:37-18:01:44
blanks with contoured edges being produced
CP28E, peter carey narration

NARRATION (VO):

MEDIUM TO LARGE SHEET METAL PARTS ARE TYPICALLY PRODUCED FROM STACKED BLANKS FED INTO A STAMPING PRESS. BLANKS MAY BE PRODUCED HAVING STRAIGHT EDGES...,
ANGLED EDGES...,
OR CONTOURED EDGES.

SCENE 29.
CP29A, tape 795, 16:21:08-16:21:24
zoom out, blanks produced on cut-

NARRATION (VO):

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to-length line
CG, SUPER: Cut-To-Length
Shearing Lines
CP29B, tape 799, 18:05:40-18:05:46
wide, blanking press producing blanks
CG, SUPER: Blanking Presses

THESE BLANKS ARE GENERATED FROM SHEET METAL COIL STOCK PRIMARILY USING EITHER CUT-TO-LENGTH SHEARING LINES...,
OR BLANKING PRESSES.

--- TOUCH BLACK ---

SCENE 30.
CG, SUPER: Cut-To-Length
Shearing Lines
CP30A, tape 795, 16:07:08-16:07:21
pan, cut-to-length shearing line
CP30B, tape 795, 16:12:12-16:12:19
cut-to-length uncoiler
CP30C, tape 795, 16:27:42-16:27:55
zoom out, cut-to-length measuring system
CP30D, tape 795, 16:18:45-16:18:59
cut-to-length shear, generating blanks, zoom out to stacking system

NARRATION (VO):

CUT-TO-LENGTH SHEARING LINES TRANSFORM COIL STOCK INTO ACCURATE CUT-TO-LENGTH BLANKS...,
TYPICAL CUT-TO-LENGTH SHEARING LINES HAVE AN UNCOILER TO HOLD THE MASTER COIL...,
A MEASURING AND FEEDING SYSTEM TO DELIVER THE COIL STOCK TO THE SHEAR...,
A SHEAR TO GENERATE THE SHEET METAL BLANKS...,
AND A STACKING SYSTEM THAT STACKS THE BLANKS AFTER BEING CUT.

SCENE 31.
CG, SUPER: Straightener/
Leveler
CP31A, tape 795, 16:12:51-16:13:04
pan from coil coming off uncoiler to straightener/leveler
CP31B, tape 787, 05:12:37-05:12:58
zoom out, coil stock running between opposing rollers

NARRATION (VO):

COILED SHEET METAL STOCK TENDS TO RETAIN ITS CURVATURE, OR SET, AS IT IS UNCOILED. FOR THIS REASON, CUT-TO-LENGTH SHEARING LINES ALSO INCORPORATE A STRAIGHTENER OR LEVELER IN-BETWEEN THE UNCOILER AND THE SHEAR TO FLATTEN THE UNCOILED SHEET METAL.

SCENE 32.
continue previous shot
CP32A, tape 795, 16:14:34-16:14:51
zoom out, leveler

NARRATION (VO):

AS THE SHEET METAL MATERIAL MOVES THROUGH THE STRAIGHTENER OR LEVELER, IT GETS FLEXED BETWEEN OPPOSING, ADJUSTABLE ROLLERS. THIS FLEXING RESULTS IN FLATTENING OF THE MATERIAL.

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SCENE 33.
CP33B, tape 795, 16:08:02-16:08:24
pan of leveler to coil in pit
CP33C, GRAPHIC: wavy edges on coil stock
CP33D, GRAPHIC: center buckling on coil stock

NARRATION (VO):

STRAIGHTENERS ONLY REMOVE COIL SET, BUT

LEVELERS, IN ADDITION TO REMOVING COIL SET, ALSO

IMPROVE FLATNESS BY CORRECTING SOME COMMON

DEFECTS FOUND IN COILED SHEET METAL STOCK. THESE

DEFECTS INCLUDE:

WAVY EDGES, WHERE THE OUTER STRIP EDGES ARE

LONGER THAN THE CENTER...,

AND CENTER BUCKLING, OR OIL-CANNING, WHERE THE

CENTER OF THE STRIP IS LONGER THAN THE EDGES.

--- TOUCH BLACK ---

SCENE 34.
CP34A, tape 787, 05:05:10-05:05:22
zoom in, blanking using a stationary-shear
CG, SUPER: Stationary-Shear/Loop-Type Line
CP34B, tape 791, 10:02:12-10:02:18
wide, blanking using a flying-shear
CG, SUPER: Flying-Shear Line

NARRATION (VO):

THERE ARE MANY STYLES OF CUT-TO-LENGTH SHEARING

LINES, WITH THE TWO PRIMARY TYPES BEING:

THE STATIONARY-SHEAR, OR LOOP-TYPE LINE...,

AND THE FLYING-SHEAR LINE.

SCENE 35.
CG, SUPER: Stationary-Shear Line
CP35A, tape 787, 05:03:51-05:04:04
zoom out, shearing of blanks
CP35B, tape 787, 05:13:11-05:13:29
pan from cut-to-length line leveler feeding coil to pit
CP35C, tape 787, 05:06:34-05:06:54
zoom out, blanks coming out of cut-to-length line

NARRATION (VO):

AS THE NAME IMPLIES, THE COIL STOCK IS

STATIONARY WHEN SHEARING OCCURS ON A STATIONARY-

SHEAR LINE...,

THE LINE INCORPORATES A PIT, WHICH ALLOWS THE

LEVELER TO CONTINUOUSLY FEED,

AND ACCUMULATE THE COIL IN A LOOP WHILE THE

MATERIAL IS MOMENTARILY STOPPED FOR SHEARING.

SCENE 36.
continue previous shot

NARRATION (VO):

ONCE SHEARED, THE BLANK IS THEN DISCHARGED TO

THE STACKER, WHILE THE COIL IS FED INTO THE

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SHEAR FOR THE NEXT CUT.

SCENE 37.
CP37A, tape 791, 10:01:26-10:01:58
zoom out, blanking using a flying-shear
CG, SUPER: Flying-Shear Line

NARRATION (VO):

WITH THE FLYING-SHEAR LINE, CUTTING IS PERFORMED USING A SLIDING DIE SHEAR THAT TRAVELS WITH THE CONTINUOUSLY FEEDING COIL. THE SPEED OF THE SLIDING DIE SHEAR MATCHES THE SPEED OF THE COIL FEED DURING SHEARING. AFTER COMPLETING A CUT, THE SHEAR RETURNS TO ITS STARTING POSITION FOR THE NEXT CUT.

SCENE 38.
CP38A, tape 343, 01:27:43-01:28:00
zoom out, slitter on cut-to-length line

NARRATION (VO):

TO IMPROVE THE EFFICIENCY OF A CUT-TO-LENGTH SHEARING LINE, A SLITTER OR SLITTERS MAY BE ADDED TO THE LINE TO PRODUCE MULTIPLE SMALL AND MEDIUM SIZE BLANKS.

--- TOUCH BLACK ---

SCENE 39.
CG, SUPER: Blanking Presses
CP39A, tape 791, 10:13:51-10:14:05
blanking press generating blanks

NARRATION (VO):

BLANKING PRESSES ARE PRIMARILY RIGID, HIGH-SPEED ECCENTRIC, OR HYDRAULIC PRESSES WITH A MAXIMUM OF 80 STROKES PER MINUTE.

SCENE 40.
CP40A, tape 799, 18:02:18-18:02:31
zoom in, contoured blanks being generated
CP40B, tape 801, 11:03:47-11:03:55
complex blanks being generated
CP40C, tape 791, 10:18:57-10:19:05
zoom out, blank with holes

NARRATION (VO):

THEY ARE TYPICALLY USED TO GENERATE CLOSED CONTOUR SHAPES FROM SHEET METAL COIL. THESE SHAPES MAY BE COMPLEX IN SHAPE...,
AND CAN ALSO CONTAIN HOLES OR SLOTS.

--- FADE TO BLACK ---

SCENE 41.
CG: Coil Processing Lines

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white text centered on black

SCENE 42.
CP42A, tape 272, 02:21:40-02:21:52
pan, coil processing equipment to stamping press
CP42B, tape 796, 17:17:32-17:17:42
pan, coil used on roll-forming line
CP42C, tape 654, 05:29:35-05:29:45
zoom out, coil used to produce ductwork
CP42D, tape 272, 02:24:47-02:25:02
pan, coil use on stamping line
CP42E, peter carey narration

NARRATION (VO):

COIL PROCESSING EQUIPMENT IMPROVES THE EFFICIENCY OF SHEET-METAL STAMPING OPERATIONS...,

AND OTHER PROCESSING LINES,

SUCH AS ROLL-FORMING...,

AND DUCTWORK MANUFACTURING.

OF THE VARIOUS PROCESSING LINES, SHEET-METAL STAMPING OPERATIONS MOST WIDELY USE COIL PROCESSING EQUIPMENT.

SCENE 43.
CP43A, tape 807, 21:08:07-21:08:19
pan, coil line feeding sheet metal to press
CP43B, tape 302, 04:02:25-04:02:46
zoom out, blanking press to handling of blanks

NARRATION (VO):

THE FEEDING OF SHEET METAL COIL STOCK IS MORE EFFICIENT THAN FEEDING INDIVIDUAL CUT BLANKS SINCE COILED MATERIAL ALLOWS CONTINUOUS PROCESSING. THIS ELIMINATES THE NEED FOR BLANKING PRESSES AND ASSOCIATED BLANK HANDLING AND STORAGE PROBLEMS.

SCENE 44.
CP44A, tape 785, 02:12:17-02:12:38
pan of coil processing line

NARRATION (VO):

USE OF COIL STOCK FOR FEEDING, HOWEVER, REQUIRES INVESTMENT IN A COIL PROCESSING LINE. SUCH LINES CAN VARY IN COST AND COMPLEXITY, DEPENDING UPON THE SOPHISTICATION OF THE COMPONENTS USED, BUT ARE NECESSARY TO HANDLE THE WEIGHT OF COILED MATERIAL.

SCENE 45.
CP45A, tape 785, 02:28:18-02:28:27
uncoiling of sheet metal
CG, SUPER: Uncoiling

NARRATION (VO):

THE BASIC FUNCTIONS OF MOST COIL-PROCESSING

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CP45B, tape 785, 02:27:14-02:27:22
coil being straightened
CG, SUPER: Straightening/ Leveling
CP45C, tape 785, 02:24:46-02:24:54
c.u. coil being fed to press
CG, SUPER: Feeding
CP45D, tape 785, 02:21:41-02:21:52
zoom in, coil skeleton being chopped up
CG, SUPER: Scrap Processing

LINES INCLUDE UNCOILING...,

STRAIGHTENING OR LEVELING THE COIL STOCK...,

FEEDING COIL STOCK FOR PARTS PROCESSING...,

AND SCRAP PROCESSING.

--- TOUCH BLACK ---

SCENE 46.
CG, SUPER: Uncoiling
CP46A, tape 786, 03:01:35-03:01:42
uncoiling of sheet metal
CP46B, tape 786, 03:12:19-03:12:31
loading coil onto pay-off reel
CP46C, tape 806, 20:19:44-20:19:52
loading coil into cradle

NARRATION (VO):

THE UNCOILING OF SHEET METAL ROLLS BEGINS WITH

LOADING COILS ONTO PAY-OFF REEL SPINDLES...,

OR INTO CRADLES USING A VARIETY OF COIL HANDLING

DEVICES AND EQUIPMENT.

SCENE 47.
CG, SUPER: Pay-Off Reels
CP47A, tape 784, 01:04:07-01:04:20
zoom out, pay-off reel dispensing coil stock

NARRATION (VO):

PAY-OFF REELS HOLD COILS ON THEIR INSIDE

DIAMETERS AND ARE USED EXTENSIVELY FOR

UNCOILING. PLATES OR ARMS ARE PROVIDED TO

CONTAIN STOCK IN THE REEL.

SCENE 48.
CP48A, tape 785, 02:26:18-02:26:23
vertical pay-off reel
CP48B, tape 785, 02:08:12-02:08:20
horizontal pay-off reel
CP48C, tape 790, 08:20:39-08:20:47
vertical powered pay-off reel dispensing coil stock
CP48D, tape 289, 01:01:50-01:01:58
non-powered pay-off reel dispensing coil stock

NARRATION (VO):

PAY-OFF REELS ARE AVAILABLE IN A VARIETY OF

STYLES AND ORIENTATIONS...,

PAY-OFF REELS CAN ALSO BE POWERED...,

OR NON-POWERED.

SCENE 49.
CP49A, tape 785, 02:17:19-02:17:28
double-end reel swivel unit, locking into position
CP49B, tape 785, 02:20:44-02:20:54
coil being set-up at one station while the other is dispensing coil stock

NARRATION (VO):

FOR HIGH-PRODUCTION OPERATIONS, DOUBLE-END REEL

SWIVEL UNITS CAN BE USED. THESE UNITS HAVE TWO

REELS ON THE SAME BASE ALLOWING FOR COIL SETUP

ON ONE REEL WHILE THE OTHER IS BEING USED.

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SCENE 50.
CG, SUPER: Cradles
CP50A, tape 807, 21:04:09-21:04:24
cradle dispensing thick coil stock
CP50B, tape 806, 20:25:40-20:25:55
tilt up, cradle dispensing coil stock

NARRATION (VO):

UNCOILING CRADLES SUPPORT COILS ON THEIR OUTSIDE DIAMETERS WITH AIR- OR HYDRAULIC-CUSHIONED SUPPORT ROLLS...,

CRADLES ARE BEST SUITED FOR COILS OF THICKER STOCK AND APPLICATIONS IN WHICH PROTECTION OF THE STOCK SURFACE IS NOT CRITICAL. CRADLES MAY BE POWERED OR NON-POWERED.

--- TOUCH BLACK ---

SCENE 51.
CG, SUPER: Straightening/ Leveling
CP51A, tape 790, 08:06:55-08:07:11
zoom in, coil stock running between opposing rollers

NARRATION (VO):

AS WITH CUT-TO-LENGTH LINES, STRAIGHTENING OR LEVELING THE COIL STOCK IS EXTREMELY IMPORTANT FOR CONTINUOUS COIL PROCESSING.

--- TOUCH BLACK ---

SCENE 52.
CG, SUPER: Feeding
CP52A, tape 806, 20:04:13-20:04:29
zoom out, slide feeding of coil stock
CG, SUPER: Slide/Gripper Feeds
CP52B, tape 295, 03:10:26-03:10:32
press driven roll feeding of coil stock
CG, SUPER: Roll Feeds

NARRATION (VO):

THERE ARE NUMEROUS METHODS OF AUTOMATICALLY FEEDING SHEET METAL COIL STOCK, WITH THE PRIMARY TYPES BEING:

SLIDE, OR GRIPPER, FEEDS...,

AND ROLL FEEDS.

SCENE 53.
CG, SUPER: Slide Feeds
CP53A, tape 302, 04:05:25-04:05:39
zoom out, slide feed, feeding coil

NARRATION (VO):

TYPICALLY, SLIDE FEEDS HAVE A GRIPPER ARRANGEMENT WHICH CLAMPS AND FEEDS THE COIL STOCK DURING ITS FORWARD MOVEMENT AND THEN RELEASES IT AND RETURNS FOR THE NEXT CYCLE.

SCENE 54.
CP54A, tape 806, 20:11:38-20:11:57

NARRATION (VO):

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zoom out, air slide feed reciprocating along guide rod

TO INSURE ACCURACY, MOST SLIDE FEEDS RECIPROCATE ON GUIDE RODS OR SLIDES BETWEEN ADJUSTABLE POSITIVE STOPS.

SCENE 55.
CP55A, tape 806, 20:05:15-20:05:42
pan, air slide feed processing coil to press
CG, SUPER: Press-Driven
Air
Hydraulic
Independently-Driven

NARRATION (VO):

SLIDE FEEDS ARE AVAILABLE IN VARIOUS TYPES INCLUDING:

PRESS-DRIVEN,

AIR,

HYDRAULIC,

AND INDEPENDENTLY DRIVEN SLIDE FEEDS.

--- TOUCH BLACK ---

SCENE 56.
CG, SUPER: Roll Feeds
CP56A, tape 790, 08:10:41-08:11:21
zoom out, roll feeding on press

NARRATION (VO):

ROLL FEEDS ARE THE MOST PREDOMINATE FEED TYPE USED. ROLL FEEDS ADVANCE COIL STOCK BY PRESSURE EXERTED BETWEEN INTERMITTENTLY DRIVEN OPPOSED ROLLS, WHICH ALLOW THE STOCK TO DWELL DURING THE WORKING PART OF THE PRESS STROKE.

SCENE 57.
CP57A, tape 790, 08:05:20-08:05:46
zoom out, independently-powered servomotor-driven roll feed
CP57B, tape 295, 03:09:27-03:09:45
zoom out, intermittent rotation of roll feed

NARRATION (VO):

ROLL FEEDS ARE AVAILABLE IN SEVERAL TYPES AND A WIDE VARIETY OF SIZES SUITABLE FOR ALMOST ANY WIDTH AND THICKNESS OF STOCK. THEY CAN FEED IN SHORT OR LONG LENGTHS, WITH HIGH SPEEDS FOR SHORT INCREMENTS.

SCENE 58.
continue previous shot
CP58A, tape 791, 09:04:13-09:04:37
zoom out, independently-powered roll feed

NARRATION (VO):

INTERMITTENT ROTATION, OR INDEXING OF THE FEED ROLLS IN ONLY ONE DIRECTION, CAN BE PRESS ACTUATED...,

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OR BE INDEPENDENTLY POWERED.

SCENE 59.
continue previous shot
CP59A, tape 785, 02:24:25-02:24:40
zoom in, independently-powered servomotor-driven roll feed
CG, SUPER: Electric Motor
Air
Hydraulic

NARRATION (VO):

INDEPENDENTLY POWERED ROLL FEEDS HAVE SELF-CONTAINED ELECTRIC MOTOR,

AIR,

OR HYDRAULIC POWER DRIVES. MOST POPULAR, HOWEVER, IS THE SERVOMOTOR-DRIVEN, DIGITALLY CONTROLLED ROLL FEED.

SCENE 60.
continue previous shot
CP60A, tape 786, 03:03:01-03:03:19
zoom out, servomotor roll feed running independent of press

NARRATION (VO):

BY COMBINING ADVANCED ELECTRONIC CONTROLS WITH USER-FRIENDLY OPERATING PROGRAMS, THE SERVOMOTOR-DRIVEN, DIGITALLY CONTROLLED ROLL FEED BECOMES AN INTELLIGENT ACCESSORY WITHOUT ANY MECHANICAL INTERLOCK TO THE PRESS, THUS PROVIDING THE FLEXIBILITY TO OPERATE INDEPENDENTLY OF THE PRESS.

SCENE 61.
CP61A, tape 785, 02:01:03-02:01:35
zoom out, zig-zag feed coil being used in stamping operation
CP61B, tape 785, 02:11:07-02:11:34
zoom in, zig-zag feed coil being used
CG, SUPER: Joggle
Zig-Zag
Oscillating
Shuttle

NARRATION (VO):

TO PERMIT BETTER MATERIAL UTILIZATION, VARIOUS FEED TYPES ARE USED IN CONJUNCTION WITH SERVOMOTOR AND OTHER INDEPENDENT FEEDERS. THESE FEEDS INCLUDE:

JOGGLE,

ZIG-ZAG,

OSCILLATING,

AND SHUTTLE FEEDS.

SCENE 62.
continue previous shot
CP62A, tape 786, 03:14:23-03:14:39
zoom out, c.u. coil stock from zig-

NARRATION (VO):

THESE FEED UNITS SIMULTANEOUSLY ADVANCE THE

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zag feed

MATERIAL AND SHUTTLE IT FROM SIDE-TO-SIDE SO THAT TWO OR MORE STAGGERED OR NESTED BLANKS ARE PRODUCED, ONE PER PRESS STROKE, ACROSS THE COIL WIDTH.

SCENE 63.
CP63A, tape 786, 03:06:09-03:06:32
zoom in, shuttle feed coil being used

NARRATION (VO):

USING A WIDER COIL TO PRODUCE INTERSPERSED BLANKS RESULTS IN A REDUCTION IN SCRAP COMPARED TO USE OF A NARROWER COIL THAT WOULD PRODUCE A SINGLE BLANK WITH HIGHER UNIT MATERIAL COSTS. THIS IS ESPECIALLY TRUE WHEN PRODUCING ROUND OR IRREGULARLY SHAPED BLANKS.

--- TOUCH BLACK ---

SCENE 64.
CG, SUPER: Scrap Processing
CP64A, tape 791, 09:05:56-09:06:14
zoom out, coil be cut into scrap using the die
CP64B, tape 295, 03:12:03-03:12:16
zoom out, press actuated scrap cutter

NARRATION (VO):

ONCE COIL STOCK IS PROCESSED, IT IS NECESSARY TO DISPOSE OF THE REMAINING SKELETON AS SCRAP. SCRAP PROCESSING CAN BE A FUNCTION OF THE STAMPING DIE ITSELF, BUT CAN ALSO BE PERFORMED USING SCRAP CUTTERS, OR CHOPPERS THAT HAVE UPPER AND LOWER BLADES TO SHEAR UP THE REMAINING MATERIAL.

SCENE 65.
CP65A, tape 295, 03:11:10-03:11:30
press actuated scrap cutter
CP65B, tape 289, 01:07:50-01:08:06
free-standing scrap cutter cutting up coil skeleton

NARRATION (VO):

SCRAP CUTTERS ARE TYPICALLY PRESS ACTUATED..., BUT ARE ALSO AVAILABLE AS FREE-STANDING UNITS WITH INDEPENDENT POWER.

--- TOUCH BLACK ---

SCENE 66.
CP66A, tape 795, 16:02:52-16:03:13
pan, high-production, continuous

NARRATION (VO):

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sheet metal processing
CP66B, tape 796, 17:14:29-17:15:10
zoom in, coil-to-coil welding operation

FOR HIGH-PRODUCTION, CONTINUOUS SHEET METAL PROCESSING OPERATIONS, IT IS NECESSARY TO JOIN THE LEADING EDGE OF A NEW COIL TO THE END OF A PREVIOUS COIL TO REMAIN CONTINUOUS. THIS IS ACHIEVED USING A COIL-TO-COIL WELDING STATION.

SCENE 67.
continue previous shot

NARRATION (VO):

THE COIL-TO-COIL WELDING ENABLES CONTINUOUS PROCESSING WITHOUT THE RETHREADING OF NEW COILS THROUGH THE PROCESSING LINE. THIS GREATLY IMPROVES PRODUCTION RATES, AND REDUCES, IF NOT ELIMINATES, DOWNTIME.

SCENE 68.
CP68A, tape 796, 17:10:35-17:10:54
pan of accumulator supplying coil to operation

NARRATION (VO):

HIGH-PRODUCTION, CONTINUOUS SHEET METAL PROCESSING OPERATIONS ALSO REQUIRE A COIL, OR STRIP ACCUMULATOR. THIS IS NECESSARY TO STORE ENOUGH COIL TO ALLOW THE PROCESSING LINE TO CONTINUE WHILE THE WELD IS PRODUCED.

--- FADE TO BLACK ---

SCENE 69.
CG: Review
white text on black
CP69A, tape 63, 12:00:15-12:03:49
review music
CP69B, peter carey narration

MUSIC UP AND UNDER

NARRATION (VO):

LET'S REVIEW THE MATERIAL CONTAINED IN THIS VIDEOTAPE.

SCENE 70.
CP70A, tape 799, 18:20:03-18:20:21
zoom out, slitting operation
CP70B, tape 787, 05:04:57-05:05:06
zoom out, sheet metal coil being rectangularity blanked
CP70C, tape 799, 18:05:13-18:05:22
sheet metal coil being blanked into irregular shape
CP70D, tape 272, 02:20:58-02:21:04

NARRATION (VO):

COILED SHEET METAL IS PROCESSED IN ONE OF SEVERAL WAYS. IT CAN BE SLIT INTO SEVERAL COILS OF REDUCED WIDTH...,

OR BE SHEARED INTO RECTANGULAR...,

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coil stock uncoiling, dissolve to next shot
CP70E, tape 272, 02:21:23-02:21:32
coiled sheet metal fed to stamping press
CP70F, tape 654, 05:24:28-05:24:36
zoom in, coil stock used in edge seaming assembly operation

OR IRREGULARLY SHAPED BLANKS FOR FURTHER PROCESSING...,

COILED SHEET METAL ALSO CAN BE UNCOILED AND FED INTO A STAMPING PRESS...,

OR OTHER PROCESSING LINES, FOR PARTS PRODUCTION.

SCENE 71.
CG, SUPER: Slitting
CP71A, tape 794, 15:05:24-15:05:50
zoom out, thin processed coils

NARRATION (VO):

SLITTING IS A SHEARING PROCESS IN WHICH WIDE COILED STOCK IS SLIT INTO MULTIPLE NARROWER COILS.

SCENE 72.
CP72A, tape 788, 06:02:13-06:02:21
zoom out, from slitting to recoiler
CP72B, tape 788, 06:21:42-06:21:47
zoom out, uncoiler reel
CG, SUPER: Uncoiler/Pay-Off Reel
CP72C, tape 788, 06:02:45-06:02:49
slitter
CG, SUPER: Slitter
CP72D, tape 787, 05:18:54-05:19:05
pan from tensioning device to recoiler
CG, SUPER: Tensioning Device
CG, SUPER: Recoiler

NARRATION (VO):

SLITTING IS ACCOMPLISHED USING A SLITTING LINE WHICH TYPICALLY CONSISTS OF AN UNCOILER, OR PAY-OFF REEL...,

A SLITTER...,

A TENSIONING DEVICE...,

AND A RECOILER.

SCENE 73.
CP73A, tape 792, 13:17:28-13:17:50
zoom out, slitting of coil

NARRATION (VO):

THE SLITTER HOLDS TWO PARALLEL SHAFTS, OR ARBORS, ONTO WHICH ROTARY CUTTING KNIVES ARE MOUNTED.

SCENE 74.
CP74A, tape 799, 18:15:10-18:15:28
zoom in, slitting of thick coil

NARRATION (VO):

AS THE KNIVES CONTACT THE PASSING COIL STOCK, THEY PARTIALLY PENETRATE THE MATERIAL. THIS BUILDS OPPOSING FORCES IN THE COIL STOCK, CAUSING A CRACK OR FRACTURE ON BOTH SIDES OF THE COIL STOCK, SEPARATING THE MATERIAL.

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SCENE 75.
CP75A, tape 348, 00:03:34-00:03:43
zoom out, pull through slitting line
CG, SUPER: Pull Through
CP75B, tape 802, 19:02:28-19:02:34
pan, single-loop slitting line
CG, SUPER: Loop

NARRATION (VO):

THERE ARE TWO BASIC TYPES OF SLITTING LINES:

THE PULL THROUGH...,

AND THE LOOP.

SCENE 76.
CG, SUPER: Pull-Through Slitting
CG, SUPER: Tight-Line Slitting
CP76A, tape 348, 00:05:02-00:05:09
pull through recoiler drive
CP76B, tape 348, 00:01:07-00:01:28
pan, zoom out, pull-through slitting line from coil unwinding to shear to rewind

NARRATION (VO):

IN PULL-THROUGH, OR TIGHT-LINE SLITTING, THE RECOILER DRIVE PROVIDES THE POWER TO PULL THE COIL STOCK OFF THE UNCOILER REEL...,

THROUGH THE SLITTER...,

AND RECOIL THE PROCESSED STRIPS.

SCENE 77.
CG, SUPER: Loop Slitting
CP77A, tape 792, 13:13:14-13:13:28
pan, slitter to coils in pit
CP77B, tape 792, 13:14:34-13:14:52
zoom out, slitter
CP77C, tape 793, 14:07:13-14:07:24
zoom out, recoiler

NARRATION (VO):

IN LOOP SLITTING, A PIT IS INCORPORATED INTO THE LINE. THE PROCESSED COIL STRIPS ARE LOOPED INTO THE PIT WHICH ASSISTS IN ABSORBING THE STRIP LENGTH DIFFERENTIAL WITHIN THE SLIT COILS. THE SLITTER TYPICALLY PROVIDES THE POWER TO BOTH UNCOIL...,

AND SLIT THE MATERIAL...,

WHILE THE RECOILER PROVIDES THE POWER TO REWIND THE MATERIAL.

SCENE 78.
CP78A, tape 293, 02:01:14-02:01:36
large sheet metal part produced using sheet stock
CP78B, tape 795, 16:21:08-16:21:24
zoom out, blanks produced on cut-to-length line
CG, SUPER: Cut-To-Length Shearing Lines
CP78C, tape 799, 18:05:40-18:05:46
wide, blanking press producing blanks
CG, SUPER: Blanking Presses

NARRATION (VO):

MEDIUM TO LARGE SHEET METAL PARTS ARE TYPICALLY PRODUCED FROM STACKED BLANKS FED INTO A STAMPING PRESS. THESE BLANKS ARE GENERATED FROM SHEET METAL COIL STOCK PRIMARILY USING EITHER CUT-TO-LENGTH SHEARING LINES...,

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OR BLANKING PRESSES.

SCENE 79.
CG, SUPER: Cut-To-Length Shearing Lines
CP79A, tape 795, 16:07:08-16:07:21
pan, cut-to-length shearing line
CP79B, tape 795, 16:12:12-16:12:19
cut-to-length uncoiler
CP79C, tape 787, 05:12:37-05:12:58
zoom out, coil stock running between opposing rollers
CP79D, tape 795, 16:27:42-16:27:55
zoom out, cut-to-length measuring system
CP79E, tape 795, 16:18:45-16:18:59
cut-to-length shear, generating blanks, zoom out to stacking system

NARRATION (VO):

CUT-TO-LENGTH SHEARING LINES TRANSFORM COIL STOCK INTO ACCURATE CUT-TO-LENGTH BLANKS..., TYPICAL CUT-TO-LENGTH SHEARING LINES HAVE AN UNCOILER TO HOLD THE MASTER COIL..., A STRAIGHTENER OR LEVELER TO FLATTEN THE UNCOILED SHEET METAL..., A MEASURING AND FEEDING SYSTEM TO DELIVER THE COIL STOCK TO THE SHEAR..., A SHEAR TO GENERATE THE SHEET METAL BLANKS..., AND A STACKING SYSTEM THAT STACKS THE BLANKS AFTER BEING CUT.

SCENE 80.
CP80A, tape 787, 05:05:10-05:05:22
zoom in, blanking using a stationary-shear
CG, SUPER: Stationary-Shear/Loop-Type Line
CP80B, tape 791, 10:02:12-10:02:18
wide, blanking using a flying-shear
CG, SUPER: Flying-Shear Line

NARRATION (VO):

THERE ARE MANY STYLES OF CUT-TO-LENGTH SHEARING LINES, WITH THE TWO PRIMARY TYPES BEING: THE STATIONARY-SHEAR, OR LOOP-TYPE LINE..., AND THE FLYING-SHEAR LINE.

SCENE 81.
CG, SUPER: Blanking Presses
CP81A, tape 799, 18:02:18-18:02:31
zoom in, contoured blanks being generated
CP81B, tape 801, 11:03:47-11:03:55
complex blanks being generated
CP81C, tape 791, 10:18:57-10:19:05
zoom out, blank with holes

NARRATION (VO):

BLANKING PRESSES ARE TYPICALLY USED TO GENERATE CLOSED CONTOUR SHAPES FROM SHEET METAL COIL. THESE SHAPES MAY BE COMPLEX IN SHAPE..., AND CAN CONTAIN HOLES OR SLOTS.

SCENE 82.
CP82A, tape 272, 02:21:40-02:21:52
pan, coil processing equipment to stamping press
CP82B, tape 796, 17:17:32-17:17:42
pan, coil used on roll-forming line

NARRATION (VO):

COIL PROCESSING EQUIPMENT IMPROVES THE EFFICIENCY OF SHEET-METAL STAMPING OPERATIONS...,

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SCENE 83.
CP83A, tape 785, 02:28:18-02:28:27
uncoiling of sheet metal
CG, SUPER: Uncoiling
CP83B, tape 785, 02:27:14-02:27:22
coil being straightened
CG, SUPER: Straightening/
Leveling
CP83C, tape 785, 02:24:46-02:24:54
c.u. coil being fed to press
CG, SUPER: Feeding
CP83D, tape 785, 02:21:41-02:21:52
zoom in, coil skeleton being
chopped up
CG, SUPER: Scrap Processing

SCENE 84.
CG, ROLL: credits
white text on black, fade up mid-
screen
CP84A, tape 715, 01:01:10-01:01:50
GRAPHIC: AFFT logo

AND OTHER PROCESSING LINES.

NARRATION (VO):

THE BASIC FUNCTIONS OF MOST COIL-PROCESSING

LINES INCLUDE UNCOILING...,

STRAIGHTENING OR LEVELING THE COIL STOCK...,

FEEDING COIL STOCK FOR PARTS PROCESSING...,

AND SCRAP PROCESSING.

--- FADE TO BLACK ---

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SCENE 85.
CG: disclaimer
white text centered on black

Some machinery in this program had safety equipment removed to allow better recording of certain processes.
Always read the safety information provided in the manufacturers' manual before machine operation.

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SCENE 86.
CP86A, tape 40, 01:00:00-01:00:12
SME logo, with music
CG, SUPER: www.sme.org